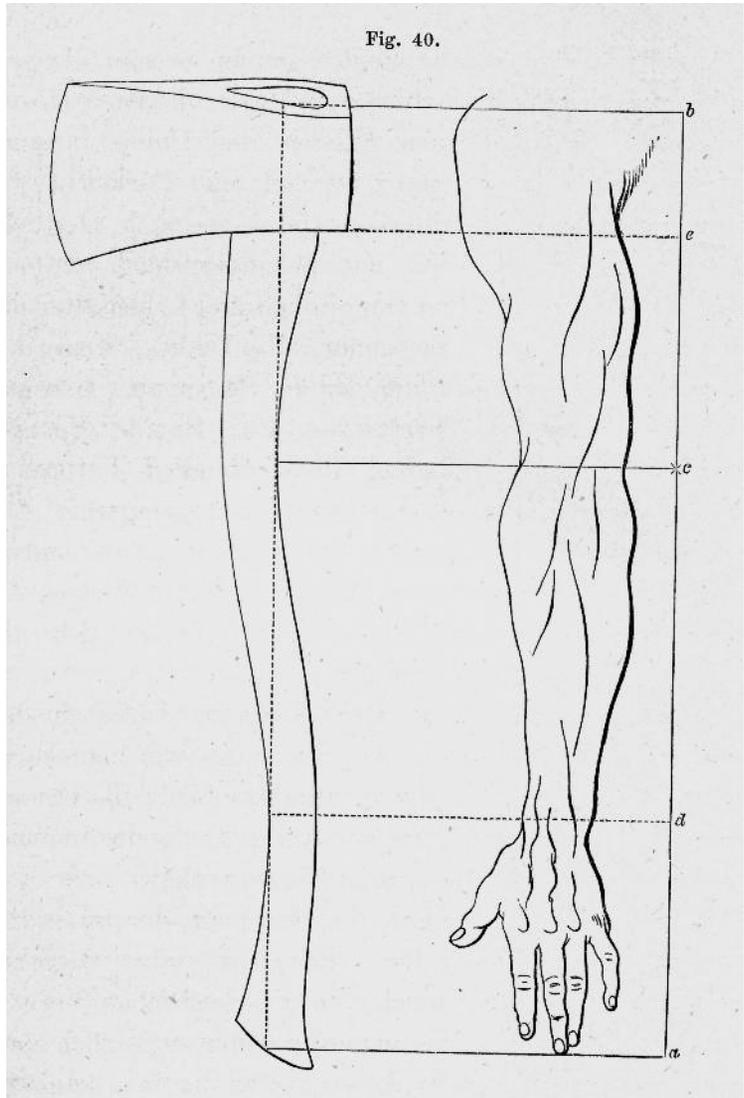


Fig. 40.



"The American axe and the human arm." From Ernst Kapp, *Grundlinien einer Philosophie der Technik: Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (1877).

Selections from *Elements of a Philosophy of Technology*

ERNST KAPP

TRANSLATED BY LAUREN K. WOLFE

Chapter 2: Organ Projection

In the early 1860s, at a meeting of the Berlin Philosophical Society during which the age of the human race was being discussed, Carl Schultzenstein remarked that everywhere the human being has appeared, he has been obliged first to invent a suitable way of life for himself and to procure this by artifice, in such manner that, in the human being, art and science take the place of the animal instinct. In this way, the human being becomes the creator of himself, even of his body's formation and refinement. To which Ferdinand Lasalle assented, replying: "This *absolute self-production* is precisely the most profound point in humankind."¹

Here we have happened on a remark that will be useful in articulating a concept of projection in the sense that we would like to understand it.

Use of the term "projection" adheres strictly in all cases to its basic etymological meaning. In the military, missiles are called projectiles; in building design, one speaks of architectural projections; and apart from projects undertaken in the world of business, the term is especially endemic to draftsmanship, referring to every sort of sketch, map, plan, blueprint, and in particular to the cartographer's grid. Who, for instance, is unfamiliar with the parallel- and meridian-lined grid known as "Mercator's projection"?

Beyond these specific instances, what is of greater interest is just how frequently physiologists and psychologists use the word to describe the relation of the sensations to external objects and to describe the formation of representations [*Vorstellungen*] in general.

In all of these cases, *to project* is more or less to throw out or forth, to place before or displace outward, to relocate something interior into the outside world. When taken literally, projection and representation are not actually all that different, insofar as the inward act of representing is not independent of the object placed before the eyes of a representing subject.

A few instances will suffice to demonstrate how the expression thus far has been used in scientific works. In *The Independent Value of Knowledge*, Carl von Rokitansky writes, with reference to the displacement of things in space: "We are never conscious of the images inside of us, but only of

the things we have projected outside ourselves.” Carl Gustav Carus is a bit less direct: “In seeing, it is the object’s own action of light that we perceive internally, and not an *image* of this action of light that another would also see. The visible world emerges for us only as the sensation that is aroused in the retina projects itself outward, as it were.” Commenting on Ludwig Feuerbach’s anthropological standpoint, Karl Rosenkranz alleges that the human being projects his own nature in the form of a representation of a subject existing outside of himself, that should be differentiated from him; and that, when it comes to religion, the human being estranges himself from his own nature by projecting representations that correspond to no reality.²

In his *Elements of Psychology*, Frederik Anton von Hartsen briefly describes the projection that is thought to be the soul apparently stepping forth from the body as the “*expulsion* of spiritual attributes.” He writes about the projection of both sensations and desires and claims he is able to prove that the projection of psychic attributes takes place not only in space but in time as well.³

So far, the theory of projection has played a significant role in the study of spatial representation and the direction of vision as well as in explaining the upright position of the perceived object with respect to the inverted retinal image.

Generally speaking, depending on whether projection is accepted or rejected, two theoretical camps emerge, which Helmholtz has identified as “*empirical*” and as “*nativist theories*.” To the former belong, beside the Herbartians, Helmholtz and the majority of physiologists, including Johannes Müller, Carl Ludwig, Otto Funke, Carl Lange, and above all Friedrich Ueberweg, whose treatise “*Toward a Theory of Vision*” effectively revitalized the subject after a period of apparent dormancy. Even more recently, the subject was taken up in Eduard Johnson’s contributions to the *Philosophische Monatshefte*, in Paul Kramer’s “*Notes toward a Theory of Spatial Depth Perception*,” and in Carl Stumpf’s book *On the Psychological Origins of Representations of Space*.⁴

But the dispute remains unsettled. Ludwig has significantly suggested that “the verb ‘to place outside’ is only a figurative expression designating a phenomenon whereby the psyche *correlates* a condition present in the brain to an object located outside of the eyes, as its cause.”⁵

One such correlation between an image [*Bild*] in the sensorium and an object outside of it is that of fact. This is, to say the least, most closely affiliated with the projection. Though he does not use the word itself, even Johannes Müller seems with a “quasi” to want to avoid abandoning the concept entirely: “We can conceive of the visual representation as a quasi displacement forward of the entire retinal field of vision.” Wilhelm

Wundt proposes a slight restriction to this view, “that presupposes an inherent or at least a strictly given correlation of the retinal points with the corresponding points in external space.” Adolf Horwicz also clearly designates the projection “as the outward displacement of sensations into the object, as the correlation of the same with an external object.”⁶

Having suggested that there exist absolute correlations of this kind—in which an internally necessary relation inheres in both sides, each of which is constantly confronting, presupposing, and projecting the other—we will leave the issue unresolved for the time being, and we will turn instead to a process that truly warrants being called projection, because all that underlies it are the sort of facts that preclude all difference of opinion. A detailed elaboration of this type of projection—*organ projection*—will justify itself in the course of our investigation, the actual theme of which it is.

The underlying facts are familiar, historical, as old as humankind. But what is new is our treatment of them, proceeding from their genetic context and from the point of view of projection that is here applied to them for the first time.

This previously untrodden path leads straight to the historical and cultural foundations of epistemology in general. Our point of departure is the human being, who, in all he thinks and does, unless he breaks with himself entirely, can proceed from nothing other than his thinking, acting self. We are not dealing with a hypothetical *bathybius-being* nor with a hypothetical ideal human being, but with the human to whose being may attest only the traces of and changes in the things he has made with his own hands.⁷ This being alone is the fixed point at which all knowledge begins and aims. At all times, in all places, he attests to himself!

The boundary that had been assumed until very recently between a historical and a nonhistorical age, determined to the year on the basis of the biblical record—this has been set fluctuating, from the beginning of terrestrial creation, in centuries-long blocks of time.

Cave findings tell a story that is no less irrefutable than rolls of papyrus and libraries of clay tablets. They constitute a very real literature, a lapidary and pictographic script consisting of fossils and pottery, tools and rudimentary markings. This testimony lets us infer the nature and condition of human and animal kinds, as, under primitive conditions of competition, they fought simultaneously to wrest life from one another and to establish dominion.

In light of these findings, and of others that are unfolding new labyrinthine paths for contemporary linguistic research, the concepts of the historic and formerly so-called prehistoric are blurring to the point of indistinction. Those who pursue a distinction or demarcation of one

sort or another are going to have to get used to the idea that the actual prehistoric human is a being no trace of which exists, not even in the crudest tool—for with the first tool history commences, because it is the first work. Insofar as history is understood as the progression of human work, the first work is, to say the least, the inception of something like history. Hence, incipient history only begins to take recognizable shape as history proper where a separation of workers by vocation begins to appear in the division of labor generally, in preparation of the eventual fixed division of the members of the social body into castes and the state body into estates.

All work is activity, but only conscious activity is work. Animals do not work. In the so-called animal colonies of ants and bees, one finds a division of mere industriousness. The division of labor, of conscious vocational work—that is what comprises the historical state and is already history.

Between actual prehistory—that is, human being prior to all history—and genuine history, incipient history has been assigned its place.

In the works published on this subject from the standpoint of a theory of descent, more often than not an author will tend to supplement with outright fantasy his depiction of the physique and the way of life of primitive human beings. As a result, one is asked to imagine the primitive human being at one moment as a brute among brutes, at another as an animal-like creature endowed from the outset with the germ of historical potential.

In view of the rude and savage animal world, in the vicinity of which we have to imagine the “budding” human being, we cannot overestimate its physical characteristics. Doubtless he displayed gorilla-like strength and agility. He must have possessed the enormous strength of storied historical men or modern-day acrobats, though of course he would have lacked their artistry and skill. Our own modern athletes’ occasional feats of strength must have been, for primitive human beings, an ordinary, unremarkable, natural aptitude shared by all.

So long as the human being had to confront rapacious beasts unarmed, he needed to be able to match them, in the strength of his bite and nails, in the power of his fist and arm, in the simian speed with which he moved. Imagine the force and dexterity needed to beat a steer to the ground using only a fist, to break iron with one’s hands, to hold a hundred-weight from one’s teeth, to swing from a trapeze and walk the tightrope. Imagine a single human being possessing all of these powers and you will have an idea of how the primitive human was physically fitted to survive his quite literal life-or-death struggle with a hostile nature and its colossal beasts.

One is thus forced to assume that, prior to all weapon and tool manu-

facture, the primitive human being had only, besides the tremendous power of his muscles and the agility of his limbs, his more or less animal-like teeth and nails as means of attack and defense.

The use and perfection of man-made weapons naturally resulted in a corresponding reduction in physical exertion and the softening of this natural weaponry. As the human being began to produce means calculated to provide protection and security as well as a relative degree of comfort in existence, thereby increasing his intellectual activity, the human physique, no longer compelled to unusual exertion and the show of force, gradually achieved a certain balance and poise. His predatorial traits receded to the same degree that his intellect emerged. The wounding and lethal features of his physical body were gradually displaced into weapons, giving way to a human appearance. The jaw receded into the organs of speech, the claw-like extensions of the hands he once walked upon became the protective nail coverings for his fingers as they worked. With demands subsiding, a convivial being with upright posture replaced the crudely modeled body formed for a savage way of life.

Of course we can only sketch a very broad-stroked outline of how these developments are supposed to have unfolded, based on inferences drawn from contemporary ethnography. Comparative geology has, on the other hand, established for us well-defined periods of time in which to group certain developments.

According to the general laws of development, for which there exist thousands of points of comparison the world over, Karl Siegart, among others, assumes in his work on *The Age of the Human Race* that the human being is supposed to have passed through four distinct stages of civilization: the crude, animal-like state of nature in which the savages lived is supposed to have lasted for millions of years; the half-savage way of life, marked by the advent of the Stone Age, he numbers at roughly one hundred thousand years; the period of incipient culture (passage from the higher Stone Age into the Bronze Age), which is characterized by the continuing development of forms of government, religion, and society, he estimates at seven millennia; and the period of higher civilization of one separate human clan (the ancient Greeks and Romans), is said to have existed for centuries.

Siegart calculates the duration of the posttertiary period and the known age of the human race at 224,000 years.⁸

Any pertinent attempt at working man out from his rude beginnings can proceed only on the basis of the theory of organic development. However, the prevailing conflict of opinion means that it is impossible at this point to decide which theory is better suited to doing so: either Darwin's theory as elaborated in *The Origin of Species* or a theory that

instead assumes “original dispositions” unique to each species.

Among the works we will be pursuing here, Otto Caspari’s *The Prehistory of Humankind* argues a brilliant position. The author is not partisan. After acknowledging the efforts of those who have earned their prominence as leaders in the field of the science of human beings on general ethnopsychological grounds, he introduces his own argument as follows: “. . . I believe Darwin is owed great respect. It seems to me that I have only attempted to carry over into the study of the earliest spiritual life of humankind his renewal of a theory of descent in the study of natural history, through which he brought to light a fertile insight into the value of the history of organic development.” Nevertheless, for Caspari, a thriving development depends entirely on whether “together we keep the ideal in sight and refuse to allow ourselves to be swayed by the spirit of a skepticism that recognizes in humankind no aims at all.”⁹

From there, Caspari turns to his task: to lift the primitive human being out from the animal world and bring him toward the ideals of humankind, though not without again emphasizing the precondition of an “*original disposition*.” Caspari explains the ascent of the human being from the animal in terms of the animal’s absolute lack of the original disposition to manual dexterity and speech. “We have to recognize that the ultimate root from which particular factors of development are cultivated is to be sought only in dispositions of a spiritual and physical sort. All development originally proceeded from this inwardly rooted disposition to a splendid character and a temperament capable of being cultivated.”

Now here we stand, with the human being before us, ascended from its original condition of unremitting defense against bloodthirsty predators, poised now to attack and destroy by means of apparatuses and *tools* manufactured by his own hand to increase the natural strength of the same.

Here is the actual threshold of our study: the human being, who, with the first equipment, the work of his own hands, discards his historical test piece to become the altogether historical human being, situated within the progress of self-consciousness. The human being is the only secure starting point for thoughtful reflection and for orientation in the world. This is because the human being is absolutely certain first and foremost of himself.

Occupying the center between the twin goals of research—the geological beginnings and the teleological future—is the human being: the fixed point from which thinking proceeds, forward and back, to expand the boundaries of knowledge; and to which it returns, in renewed health, from those regions to which research has no access because subjective interpretation has led it there astray.

Chapter 7: Steam Engines and Rail Lines

We are now leaving the domain of those works of technology that, though universal and widely available in countless variety, we have to this point considered in isolation. We turn our reflections now to the massive cultural means that, like the railroads and telegraphs that span the entire globe and link all the world's parts, far exceed the term "apparatus" and appear to us as *systems*. But before we can discuss the railroad as a system, we need to understand a single factor of it, the *steam engine*, since all that holds true for the steam engine also holds true for this one particular form of its application—the locomotive.

In the rotunda of large-scale industry, the steam engine, as a machine in the superlative sense, is *the machine of machines*, in much the same way that the hand tool is the tool of all other tools in the domain of individual mechanical forms. Once industry, conceived in and gradually evolved out of handicraft, had expanded sufficiently to draw on wind and water power, the human being found that he was capable of handling enormous quantities of matter and, moreover, that he was able, through regulation and exploitation of natural forces, to reserve a significant portion of his own physical strength that he had previously had to expend directly in the process of work. But the power of wind and water is intermittent, and the use of it—seafaring is no exception—depends on both time and place. The human being is subject to changes in the weather and season and to nature's dominion generally; and even though he may attempt to contain nature for his own purposes by means of dams, floodgates, and gear mechanisms, still nature by and large makes no attempt to accommodate him.

By now it has been one hundred years since James Watt perfected the steam engine. The ancient elements—a tight phalanx of earth, water, air, and fire—obeyed its summons. A comprehensive new motor had been achieved and this marvelous invention began its tour around the world. This is where large-scale industry begins.

With the mastery of steam emerges an engine power of universal accommodation as well as a new concept of work, and this is simple to explain. Mass work requires masses of workers. In a certain respect, the regional concentration of workers is perceived as a sequestration, and "the worker"—feeling constantly a being-for-itself and a being-among-themselves—soon comes to believe it must be privileged, vis-à-vis the other professions, as an estate of its own.¹⁰

We do not have the space here to further elaborate this phenomenon. In fact, we mention it only because, bound as tightly as it is with the entire cultural inventory, the worker phenomenon bears witness to the world-historical significance of the first machines to have been built on

the analogy of the concept of the *conservation of force*. The full impact of this on the future is at present beyond the realm of measure.

Known, admired, and in use the world over, the steam engine is truly a “universal all-purpose machine.” It facilitates all human activities, in the home and yard, in forest and field, on water and land; it functions as draft and pack animal, helps lay cable and print books; and, given the universality of its capabilities, it is particularly qualified to serve as the sensuous illustration of the principle of the conservation of force. The steam engine is frequently evaluated in comparison with the bodily organism. Among others, Otto Liebmann writes that “indeed, we find many remarkable analogies. Both display a complex system of inter-related, articulated parts whose movements may be integrated; both are competent to perform certain kinds of mechanical work. The locomotive, like the animal, needs to be fed in order to convert the heat generated through chemical oxidation processes into a system of movements. Both secrete waste, products of combustion, in more than one state of matter. There is wear and tear and exhaustion of machine parts as there is with organs. In both we find the interruption of all functions and death either when the input of fuel or nutrients ceases or when an essential part of the machine or the organ is destroyed.”¹¹

Helmholtz elaborates at length on this comparison in his lecture *On the Interaction of Natural Forces*: “Now then, how does the organic being move and work? To the last century’s builders of automata, humans and animals appeared like clockwork that never needed winding, that created its own motive power *ex nihilo*; they did not yet know to make the connection between nutrients consumed and the generation of power. *But since we have learned from the steam engine something about the origin of this power of work*, we have to ask: does it work the same for human beings? In fact, the continuation of life is bound to the continuous intake of nutrients. Nutrients are combustible substances that, once completely digested and taken up into the blood, are actually submitted to a slow combustion process in the lungs and finally pass into the air in the same oxygen compounds that arise from the combustion of an open flame. . . . The animal body therefore does not differ from the steam engine by the manner in which it produces heat and power but by the purposes to and the manner in which it applies the power thus generated.”¹²

J. Robert Mayer puts it very similarly in his lecture “On Nutrition.” After showing how animal nourishment differs from that of plant life, he goes on to say: “The animal further distinguishes itself from plants essentially through its ability to generate voluntary movements. But the material required to perform this mechanical work originates in the plant world, though even in the world of plants we are dealing with an

antecedent energy source in the sun. Therefore, the animal actually converts what had once been sunlight into heat and motion. In this respect—I say, in *this* respect—the animal organism, given the limitless variety of ways in which the whole of it may be broken down into analyzable parts, may be compared with a steam engine. The steam engine too consumes the sunlight stored in the world of plants in order to operate, to generate work—and produce heat; and we cannot help using such a comparison now and again, with respect to animal nutrition as well as human—which, with regard to its body, has very much in common with the animal.”¹³

With recourse to such qualified experts as Mayer, who discovered the mechanical equivalent of heat, and Helmholtz, who developed this theory into the law of the conservation of force, we hardly need cite any further evidence, since between the two of them what is pertinent to the *comparison of the standard machine with the standard prototypal image of all machinery* is more than sufficiently covered. But the comparison itself is only pertinent when it is complete, and it is complete when, apart from detailing all the points of agreement, emphasis is placed upon the general, characteristic difference that alone affords meaning and significance to the agreement that has been discovered. In this respect, one might follow with particular interest how resolutely these experts preserve the concept of the organic from obfuscation through admixture of the mechanical. Mayer is compelled to add expressly, that while comparison is founded on the detection of similarities, similarities are nevertheless a long way from identity. “The animal is by no means a mere machine; it even stands high above the plant, since it has a will.” Helmholtz draws the distinction between machine operations and human work even more explicitly: “When speaking of the work of machines and natural forces, we must naturally be careful to exempt the activity of human intelligence from our comparisons. What appears in the work of machines as intelligent action naturally belongs to the intellect of he who built it and cannot be credited to the machine as work. . . . The concept of work has obviously been transferred to machines, given that their performance is often compared with that of animals and human beings, whose performance the machine was meant to replace. . . . The clock’s gear mechanism therefore does not generate any work power that is not first imparted to it, but steadily allocates over a period of time that which was already imparted.”

No less pertinent is Liebmann’s comparison of the machine with the human organism, in which he puts the obvious similarities aside to emphasize the difference: “But! But! The machine is an extrinsically and deliberately made artifact, while the organism is grown *ex ovo* according to a hidden, immanent law. The *hegemonikon* of the machine does not

belong to it, does not reside in it; the stoker and engine driver sit on top of it and direct it, like the rider his horse. The *ἡγεμονικόν* [*hegemonikon*: “ruling power,” often “reason”] of the living organism—*intelligence* and *will*—belongs to it, rests within it, originates with it, forms its integral constituent parts. And—without even taking its functions into account—the machine parts are there permanently; its constituent parts remain identical with themselves, until the point that external repair becomes necessary. But the organs of the organism remain self-identical in form only; their substance changes constantly, as they regenerate and repair themselves.”

Explanations like the above help protect against the degrading mechanistic worldview that imagines the becoming-machine of human beings and the becoming-human of machines. Helmholtz’s expression, *that the concept of work for machines was taken from a comparison with human beings*, immediately implies that the machine itself, if it is meant to substitute for human work, will be constructed to correspond with the organism whose work it is supposed to perform. The machine’s ability to operate—or rather, its usability—is immediately correlated both with the human being that uses it and with the purpose the organ’s own activity was intended to achieve prior to any mechanical support.

The individual tool manifests more or less recognizably both the operative capacity and the form of the organ at the same time. With complex machinery, the former stands out much more prominently, while by contrast the latter tends to recede. The form of the steam engine as a whole and that of the human body have little or nothing in common in appearance, albeit particular machine parts may resemble individual organs. Many machine parts, originally isolated tools, are externally assembled in the steam engine to produce an overall mechanical effect, while the limbs of the animal link up inwardly, from the simplest to the most complex organic living entity—the human being.

In this way, the *theory of organic development* corresponds with a *practice of mechanical perfectibility*—ascending from the primitive stone hammer through all tools, apparatuses, and machines of simple construction, to that complex mechanism in which the *model machine* may be recognized. We say *model machine* because science perceives its value as a tool and as a kind of physical apparatus through which to understand the interaction of natural forces as well as the life processes in the organism. “The invention of the locomotive engine may be said to have begun when the first men learned how to make a fire and keep it alive with fuel; another early step was the contriving of a wheel; command was won, by degrees, of the other mechanical powers, at first in their simplest, then in their more complicated forms and applications;

the metals were discovered, and the means of reducing and working them one after another devised, and improved and perfected by long accumulated experience; various motive powers were noted and reduced to the service of men; to the list of such, it was at length seen that steam might be added, and, after many vain trials, this too was brought to subjection—and thus the work was at length carried so far forward that the single step, or the few steps, which remained to be taken, were within the power of an individual mind.”¹⁴

The greatest inventions turn out to be products of an ongoing process of self-finding, whose aim the human being is unconscious of at first. The preparators positioned along this protracted world-historical boulevard of inventions leading to the steam engine were sufficiently conscious of their present individual purposes, though unconscious of the great cultural idea their work hastened to manifest in the locomotive. Just as finding and intentionally devising persist in reciprocity, *so do the conscious and the unconscious incessantly displace and work through one another*. But prior to the moment that the idea is actualized, the restlessness of conscious searching has the upper hand. After a succession of individual inventions have stripped away enough layers, one begins to discern the idea through the few translucent layers remaining; at last, the idea occurs to an individual who perseveres in his research and has the courage to perceive. James Watt perceived clearly and explicitly what he was looking for, and therefore he succeeded, when the time was ripe, in accomplishing the desired invention on the ground that all prior experiments had unconsciously prepared for him—though even Watt could not have foreseen the next, higher phase to which Stephenson would take his invention.

Though existing simultaneously, for a long time the steam engine and rail lines were alien to one another. Then Stephenson provided the steam engine with steady and reliable forward motion and, by submitting rail lines to the *locomotive*, he created railroads. So long as rail lines and the steam engine existed independently of one another, the rails themselves represented only a slight improvement in conditions for the familiar animal-powered mining trains, while the steam engine remained little more than a wind- and water-power substitute that could be erected anywhere. But, united to form the *railroad network*, and further expanded in the *steamship lines* that crisscrossed rivers and oceans, rail lines and steam engines have become our contemporary medium of universal communication, the mediator of the pervasive human presence the world over.

Rail lines united with steamship lines to form a closed system, the network of transport arteries through which circulate humanity’s means of subsistence—a likeness of the blood vessel network in the organism.

From our perspective, it certainly would seem strange if, in its depiction of the circulation of blood, science had failed to seize on the available analogy between the organic process and the mechanism by which the life requirements of human beings are circulated. Time and again we come across remarks indicating that in this case it is nearly as impossible to avoid recognizing organ projection as it is to avoid the by now habitual comparison made between the nervous system and the electrical telegraph.

In light of this, we can appreciate the comparison Heinrich Oidtmann had occasion to make when describing blood circulation in a recent public lecture. According to the report in the *Kölnische Zeitung*, “Oidtmann managed to provide the audience with a clear idea of the complicated processes of blood circulation by invoking an image of a railroad network, with a set of double rails, with through-rails and connecting rails, with stops and in- and out-bound lines.” It should be self-evident that what is meant by “image” here is not the allegorical figure that we have mentioned at several points already. That is, the “image” is not a pure simile that puts at one’s disposal an apparently unlimited number of possible comparisons; rather, it is the concrete image and reflection of the projection, which exists uniquely. In a talk concerning steps that needed to be taken in order to improve the transportation system, Franz Perrot first gives a detailed account of existing transportation facilities on land and water before concluding with the following: “It is a self-evident matter of fact that transportation’s several branches do not exist independently of one another but instead interlock, reciprocally condition each other, and together form an interrelated whole that is approximately for the state what blood circulation is for the human body.”¹⁵ Likewise, Max Perls puts “the great railway lines” on a level with “the communication system of the blood vessels.”¹⁶

So much, then, for the steam engine, and for rail lines as the primary condition for its locomotion—a situation that we will encounter again later on in the context of other functions of the state.

What also appears so incredible here is the prevalence of the unconscious in the creation of such a powerful lever of industry. Certainly, the idea could not have been far from the minds of James Watt and Robert Stephenson, that they might allow their own bodies to stipulate for them the law and the norm for the mechanical structure of their machines. That being said, the coordination between them is so exact that this affinity between the organic prototypical image and its mechanical afterimage serves as a considerable source of evidence for even the most respected representatives and interpreters of knowledge concerning human beings. Why else this constant appeal by the sciences to the fittings of mechanical apparatuses and their recourse to the vocabulary of mechanics? But

let us not forget that the unconscious, though it may recede when it comes to executing the particulars of technical engineering, is felt to be all the more operative when we index the organ's disposition to activity to the mechanical construction of forms. Since, as the steam engine so clearly illustrates, progress toward higher mechanics consists less in the unconscious reproduction of organic forms than it does in the projection of their *functional* image—that is, the image of the living and of spirit operating as organism.

What instills in us such great admiration for the steam engine is not any of its technical particulars—not, for instance, the reproduction of an organic articulated joint using rotating metal surfaces lubricated with oil; not the screws, arms, hammers, and pistons. Rather, it is the feeding of the machine, the conversion of combustible materials into heat and motion—in short, the curiously daemonic appearance of a capacity for self-motivated work. Here we are reminded of the higher provenance of the machine in the human being, whose hand built the monstrosity and set it free to compete with storm and wind and waves. Every scrutinizing glance cast upon it contributes to establishing the truth of Feuerbach's proposition that *the object of any subject is nothing else than the subject's own nature, taken objectively*.¹⁷

Chapter 9: The Unconscious

Since we have arrived again at self-consciousness, via the bridge of the unconscious, it seems we would benefit from a more precise delimitation of the zone within which organ projection essentially participates in the concept of the unconscious—a concept lately expanded to near universality. This is not an easy matter, because, as we know, definitions of a single object all too often differ. At this point, we would be hard-pressed to find two thinkers with the exact same understanding of how the unconscious clearly emerges from the living. At present, a fairly vigorous debate over the *Philosophy of the Unconscious* is coursing throughout much of the literature.¹⁸

Everyone has his own unique standpoint. By this we do not mean only where one's feet meet the ground, that place that no two human beings can occupy at exactly the same time. What we mean, above all, is the standpoint of one's own thinking, according to which things appear differently to the minds of different human beings. No one thinks to deny that there is much that is operative within us of which we are unaware. All previous, sporadic thought and writing on the topic have for the first time been compiled and set firmly in a scientific context by the independent and exhaustive efforts of Carl Gustav Carus. He published this work in the form of a history of the soul's development, titled *Psyche*.

Carus himself calls it “a work he had long cherished, much pondered over, and had to rethink time and again.” It was for him “the dense fruit of many years of study, over the course of which I endeavored to lay out—always in genetic sequence, unfettered by didactic methods, and in the simplest manner possible—what those moments of clearest reflection had caused to mature in my mind, as the faithful yield of a deliberative intuition.”¹⁹

The book, having come into being under the guarantee of such a strong “scientific conscience,” deals in its three main sections with *the unconscious life of the psyche*, *the conscious life of the psyche*, and with *what is transient and what is eternal in the psyche’s conscious and unconscious*.

The first section is concerned with the initial formative processes in the human organism and its primary organization, which is unconsciously regulated by the idea; with the unconscious in the process of individuation within the species; with what belongs to the field of the unconscious once a psyche has become conscious of itself; and with pathological states in unconscious psychic life. The following section grapples with the emergence not only of the psyche in animals but also of the psyche and the spirit in children; with the interaction between unconscious and conscious psychic life; with the growth of psychic life; with the psyche’s acquisition of personality and character; with the various emissions of psychic life, according to emotion, cognition, and will; and, prior to the relatively short though consequential third and final section, the second one closes with a discussion of psychic health and psychic illness.

This is the rich material of a work that should be considered foundational for all future studies of the unconscious. It is evident that, with very few exceptions, this sort of assessment of the *psyche*—one that is concerned with appropriately acknowledging all the work that came before it—had been missing from the literature in question, a lack which seems to have had a negative impact on “the conscious continuity of intellectual work” that Karl Friedrich Zöllner has called for.²⁰ As the Arabic proverb puts it: *The credit belongs to the founder, even if his successor outperform him.*

The successor who is least liable to be accused of having ignored Carus’s work on the psyche, and who has at the same time outperformed it, is the author of *The Philosophy of the Unconscious*, Eduard von Hartmann. To be sure, von Hartmann declares expressly in the chapter that deals with his predecessors’ takes on the concept of the unconscious: “The concept of the unconscious has hardly any purchase in the new *natural science*. A notable exception to this is found in the work of the prominent physiologist Carus, whose *Psyche* and *Physis* are essentially concerned

with studying the unconscious in its relation to bodily and spiritual life. It is left up to the reader to decide how far he succeeds in the attempt, and how much I can have borrowed from him in my own. I would only add, however, that here the concept of the unconscious is clearly presented in its purity, independently of that comparatively small consciousness.” Moreover, the expression Carus uses to introduce the *psyche*—“The key to insight into the nature of conscious psychic life lies in the region of the unconscious”—appears as the epigraph to the second part of von Hartmann’s book, “The Unconscious in the Human Spirit.”

Were one to take on the challenge indirectly hinted at above and critically compare the two works, *The Philosophy of the Unconscious* would almost certainly win: it is seldom that we encounter fewer idle words and find so many potential misunderstandings neatly avoided. On those points where the two texts agree, *Psyche* is indeed a formidable ally to the work that succeeded it; though where *The Philosophy of the Unconscious* departs from it, we clearly see the advantage in its having done so.

For Carus, the unconscious is first of all the principle subtending the historical development of the human psyche. He resists the conventional label of psychology, for the discipline as it used to be treated had since outgrown its former parameters and begun to stream into the field of psychophysics. Von Hartmann, on the other hand, who expanded and raised the unconscious to the principle of our orientation in the world, locates in the unconscious that which had always already constituted the ground of all philosophical systems.

According to von Hartmann, the unconscious in Carus’s *Psyche* is more or less narrowly conceived as one metaphysical factor in a single philosophical discipline. In *The Philosophy of the Unconscious*, as the limitless ground of all life, the unconscious is the inauguration of an entirely new worldview. One would not be mistaken in regarding this as a pantheism of the unconscious, the depiction of which—however it may emerge from the conflict between those who advocate for a universal unconscious and those advocating for a universal protoconsciousness—can hardly diminish the great benefit in having essentially quelled the alternately dualistic and monistic attacks over the relation between the concepts of soul and spirit and in having enabled the deeply personal Self of the philosophers to appear as the only possible starting point for all of philosophy.

It is not uncommon for a terminology that has been in use for a very long time to occasionally give way to another—especially when a certain progress is impeded by the former’s insistence on maintaining hackneyed tenets.

If, given the recently expanded limits of empirical research, the old

norms no longer hold, then the situation is often righted when some aspect that had been previously cast aside as insignificant comes to the fore of scientific discussion. This new priority then aids in understanding the more recent advances that have been made. The unconscious is just such a priority. The concepts of psyche and spirit rest on it, as the determining factor with which they stand and fall.

The core of the new movement—occasioned by *the philosophy of the unconscious* in connection with a theory of organic development—is simply the old question concerning the nature of the soul. But, the complete scientific depiction of the unconscious must first undergo a rigorous process of purification before the concept of the psyche will find the complement it has been lacking; only then, at this higher phase of its development, will the concept of psyche determine decisively the form to be taken by the new philosophical system that has already begun to signal itself.

In order to speak of the unconscious, we first have to become conscious that an unconscious exists and that our consciousness manifests via processes that are operating unconsciously within us. In this way, consciousness, as the middle term, yields the unity of self-consciousness with the unconscious, in such a way that by spirit we understand the psyche having become conscious of itself, and by psyche we understand the spirit latent in the unconscious.

The human being tends quite comfortably to appropriate that which makes him what he is—namely, his self-consciousness—to animals at the lower end of the scale and to the absolute at the higher end. But he falls into self-deception believing it is possible, both linguistically and materially, to step out from his own nature. On the other hand, in every other human being he is always encountering himself, for in others he rediscovers a disposition to consciousness that is identical with his own, which entitles him to make judgments and form conclusions about himself. Every other human being is his fellow human being, but no human being is the animal's fellow animal. It would be attempting the impossible to displace his own nature into the animal and to imagine its psychic life in terms of the qualities of his own consciousness.

Precisely because they are inaccessible to him, the human being lacks any appropriate expression for nonhuman conditions. If it helps him nevertheless to designate some external similarity by borrowing from himself—if only in order not to forfeit the advantage of the comparative study of nature entirely—still, he should not surrender to this deficiency in his language so unconditionally that image [*Bild*] and thing are utterly confounded. *The human psyche, the spirit, is self-definition.* On a side note, this is the basis on which all of so-called animal psychology needs

to be corrected. The animal *feels* appetite and aversion; the animal *knows* by instinctive combination of sense impressions, which it then remembers. But sensations that presage representations, and representations from which concepts arise—these the animal does not have. How much more than this is that human consciousness, which is conceivable only as the original disposition to self-consciousness. The human being makes up his representations of the nature of nonhuman “consciousness” at the expense of the integrity of his own self-consciousness.

Organ projection pursues the process of self-consciousness all the way to the world of culture, which has yet to be examined from this perspective. Organ projection is perfectly justified in making repeated reference to Carus’s *Psyche*, given that *The Philosophy of the Unconscious* positively affirms its findings.

Let us not fail to acknowledge that, according to the degree to which it participates in the unconscious, it is above all through organ projection that we recognize the impulse human nature has *to reflect itself in itself*.

This human nature is the whole human being, the enfleshed soul whose first unconscious stirring is potentially already consciousness and spirit—though we must be careful not to assume that the concept of a higher and a lower, in the sense of an order of rank, applies to soul and spirit, unconscious and conscious, consciousness and self-consciousness.

Wundt refers to psyche and spirit as the same Subject: the former being the subject of experience which, conditioned by the boundedness of this experience, leads an external existence; the latter being the subject of inner experience, in which it is abstracted from its ties to a bodily nature. “This definition leaves entirely unanswered the question as to whether the spiritual is truly independent of the sensual. For one can disregard one or more aspects of a phenomenon without however disavowing that these aspects are present.”²¹

The concepts of the unconscious and consciousness, as essential determinations of psyche and spirit, naturally also fall within the parameters of Wundt’s careful definition—which, having resulted from rigorous psychophysical investigations, should not be underestimated. The degree to which the unconscious becomes the content of consciousness is the degree to which consciousness is self-consciousness.

If the infinite threads that interweave the human being into the entire universe are located in the unconscious, then all philosophy is actually also a philosophy of the unconscious²²—and its ultimate outcome is our *self-conscious awareness of the unconscious*. Since the unconscious manifests in equal measure in the body and in spirit, self-consciousness is not merely consciousness of the subject of spiritual activity but also a consciousness of the bodily life that essentially constitutes the Self.

I conclude my own remarks on self-consciousness, so far as organ projection is concerned in this process, by citing the following remark by Virchow, which we will do well to heed:

*“The educated human being should know his own body, not only because such knowledge belongs to his education, but more so because, ultimately, the way the human being represents himself to himself becomes the foundation for all further thinking about human beings.”*²³

There are singular remarks of enduring truth that alone suffice to attest to the genius of their author, even were he otherwise entirely unknown. The above remark belongs in this category. These admirable lines register science’s noblest task—namely: an education that is unaffected by the barriers erected between expert and everyday knowledge; next, the ethical imperative that “the educated human being should know his body” as the means to this goal; and finally, the declaration of an education based on the knowledge of one’s own body as the highest form of knowledge, for the reason that it is “the foundation for all further thinking about human beings” and, let us add, for *self-consciousness*.

Notes

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1. Transcript of the proceedings, *Der Gedanke: Philosophische Zeitschrift: Organ der Philosophischen Gesellschaft zu Berlin* (Berlin, 1861).

2. Carl von Rokitansky, *Der selbstständige Wert des Wissens* (Vienna, 1869); Carl Gustav Carus, *Physis: Zur Geschichte des leiblichen Lebens* (Stuttgart, 1851); and Karl Rosenkranz, *Hegel als deutscher Nationalphilosoph* (Leipzig, 1870).

3. Frederick Anton von Hartsen, *Grundzüge der Psychologie* (Berlin, 1874).

4. Friedrich Ueberweg, “Zur Theorie der Richtung des Sehens,” *Zeitschrift für rationelle Medicin* 5 (Leipzig und Heidelberg, 1859); Paul Kramer, “Anmerkungen zur Theorie der räumlichen Tiefenwahrnehmung” (1872); and Carl Stumpf, *Über den psychologischen Ursprung der Raumvorstellungen* (Leipzig, 1873).

5. Carl Ludwig, *Lehrbuch der Physiologie des Menschen*, vol. 1 (Leipzig, 1858).

6. Johannes Müller, *Handbuch der Physiologie des Menschen für Vorlesungen*, 2nd ed., vol. 2 (Koblenz, 1840); Wilhelm Wundt, *Grundzüge der physiologischen Psychologie* (Leipzig, 1874); and Adolf Horwicz, *Psychologische Analysen auf physiologischer Grundlage: Ein Versuch zur Neubegründung der Seelenlehre* (Halle, 1872).

7. [In 1868, British biologist Thomas Henry Huxley believed he had discovered the *Urschleim*, or primordial matter thought to be the source of all organic life; Huxley named this *bathybius haeckelii* in honor of German scientist Ernst Haeckel. This matter

later proved to be a product of natural chemical processes and Huxley admitted his error.—Trans.]

8. Karl Siegart, *Das Alter des Menschengeschlechtes* (Berlin, 1874).

9. Otto Caspari, *Die Urgeschichte der Menschheit mit Rücksicht auf die natürliche Entwicklung des frühesten Geisteslebens*, vol. 1 (Leipzig, 1873).

10. [At no point does Kapp refer to a concept of “class”; rather, he speaks of *Stände*, or “estates.” Kapp’s estate concept is elaborated in chapter 13.—Trans.]

11. Otto Liebmann, “Platonismus und Darwinismus,” *Philosophische Monatshefte* 9 (1874).

12. Hermann von Helmholtz, “Über die Wechselwirkung der Naturkräfte und die darauf bezüglichen neuesten Ermittlungen der Physik,” in *Populäre wissenschaftliche Vorträge*, vols. 1–3 (Braunschweig, 1876).

13. J. Robert Mayer, “Über die Ernährung,” in *Naturwissenschaftliche Vorträge* (Stuttgart, 1871).

14. William Dwight Whitney, *Language and the Study of Language* (London, 1867).

15. Franz Perrot, *Vortrag über die notwendigen Schritte zur Hebung des deutschen Verkehrswesens*.

16. Max Perls, *Über die Bedeutung der pathologischen Anatomie und der pathologischen Institute* (Berlin, 1873).

17. Ludwig Feuerbach, *The Essence of Christianity*, trans. Marian Evans (London, 1854).

18. Eduard von Hartmann, *Philosophie des Unbewussten: Speculative Resultate nach inductiv-naturwissenschaftlicher Methode* (Berlin, 1868).

19. Carl Gustav Carus, *Psyche: Zur Entwicklungsgeschichte der Seele* (Pforzheim: 1846).

20. Karl Friedrich Zöllner, *Über die Natur der Cometen: Beiträge zur Geschichte und Theorie der Erkenntniss* (Leipzig, 1872).

21. Wilhelm Wundt, *Grundzüge der physiologischen Psychologie* (Leipzig, 1874).

22. Friedrich Zange, *Über das Fundament der Ethik: Eine kritische Untersuchung über Kants und Schopenhauers Moralprinzip* (Leipzig, 1872).

23. Rudolf Virchow, *Vier Reden über Leben und Kranksein* (Berlin, 1862).