

## Chapter 2

# The Heritage

**Abstract** This chapter first gives a respectful bow to the folk psychological concept of soul; then tells the story of philosophy and psychology from Aristotle to Franz Brentano as a continued attempt to place the psychological in the natural world and—after Galileo—within the bounds of physics. Beginning with the Athenian Golden Age, the history is laid out as a cascade of Enlightenment events, driven by growth in commercial wealth and class aspirations. The major fault line in this history is the Aristotle–Galileo rupture, and it is argued that for psychology to be whole, general psychology must bridge this fissure, giving Aristotle and Galileo each their rightful due.

## Soul

Now it so happened that history a long time ago had provided a conclusive answer to that question. “The first truly complete systematic psychology comes from Aristotle,” wrote Oswald Külpe,<sup>1</sup> and George Kantor later elaborated: “What makes Aristotle’s psychology so remarkable is that it is a fairly comprehensive psychological corpus thoroughly grounded on naturalistic foundations.”<sup>2</sup>

The recognized founder of a host of our present sciences, Aristotle has been credited with founding psychology too. It is only partly true. Psychology was evidence-based folk science long before Aristotle went to work in the Iron Ages. Like later Ptolemy’s geocentric astronomy, it was based on incontestable observation and robust and reasonable deduction. The key observation for Ptolemy was the Sun’s daily half circle pass across the sky; for the Paleolithic psychologists, it was that people stop breathing when they die. From this was deduced that breath—*psyche* in Greek—is the life-giving force, an airy, invisible substance, able to move in and out of the body. This explained the mystery of nocturnal dreams; during sleep, the psyche or soul takes leave of the body and departs for strange and different worlds. The non-identity of soul and body also explained another common

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<sup>1</sup>Misiak and Sexton (1966, p. 6).

<sup>2</sup>Kantor (1963, p. 149).

but puzzling experience, that of self-identity, that we basically remain the same despite our ever-changing bodies.

As long as they keep to the data from which they are built, evidence-based theories, like curve-fitting, cannot be easily faulted; on the contrary, as they provide coherent maps of the status quo, you can steer by them. It was for this reason Ptolemy's tables were indispensable to navigators for more than a millennium and a half. The Theory of Soul has been indispensable for much longer. Built from observation and common sense, with our experience of being unitary striving agents with consciousness, and linked with the first-person pronoun of language, the concept of soul simply became essential to the way we understand ourselves and communicate with each other. It is difficult to see how we could have done without it, and justified that Ebbinghaus pays it this tribute in his 1902 textbook: "Carrier and foundation of all mental life is a particular, unitary, simple, and independent essence, the Soul."<sup>3</sup>

As Ptolemy's theory proved when elaborated with more and more epicycles, you can, however, have too much of a good thing. The first epicycles added to the Theory of Soul seemed helpful and credible enough. For instance, that as breath is vapor, and vapors rise, so do souls, and therefore presumably have their final resting place in the Heavens.<sup>4</sup> But as more and more apps were added, for instance, as Socrates argued, that souls have learnt mathematics from the gods during their heavenly stay, the theory became increasingly spurious and top heavy. And as humankind ascended from the animistic world (*anima* is breath in Latin) of the hunter with his brother bear and sister elk, to the early days when the fertility god at harvest time gave up his body in sacrifice to the farmer, and further on to the new regime when elves and forest spirits were superseded by a royal family of capricious super-hero gods, the folk psychology of soul inevitably morphed into religion, which, of course, was contrary to what Ebbinghaus was talking about. Neither did it help that the theory soon was co-opted and turned into the ideological bulwark of ruling elites, a known graveyard of many a field of science. In western culture, this was most famously done by the aristocrat and philosopher Plato whose doctrine of *Idealism* came to bolster the hegemony of the landed aristocracy for a thousand years, only contested by Democritus' doctrine of *Materialism*, kept alive and fielded on occasion by the urban commercial classes in their perpetual struggle for emancipation from feudal rule.

## Master Model

This epic conflict, crucial in the history of psychology, is where Aristotle enters the picture. Plato, for 20 years his principal in the Academy, held that only ideal and spiritual forms are real, matter is false and to be ignored. Democritus held that only

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<sup>3</sup>"Träger und Grundlagen alles psychischen Lebens sind besondere einheitliche, einfache und selbständige Wesen, die Seele." Ebbinghaus (1902/1911, p. 12).

<sup>4</sup>As vapors also linger at water surfaces, an alternative abode for souls would be in lakes, which allegedly is the etymological origin of the German 'Seele' from which the English 'soul' is derived.

tiny material particles (*atomos* in Greek) are real, while forms are mere illusions. Aristotle held that both were wrong when denying the other. There can be no matter without form, and no form without matter, he insisted. Form and matter can be analytically distinguished, but not separated from each other. It is the task of science to study the forms, but it can only be done by studying their material embodiments. Declaring psyche to be form, Aristotle hereby reined in the fickle soul and made it an expression of and inseparable from the material body. *This was how psychology was first founded as a naturalist science.*

That truth to be true and objective must be immutable and not vacillating was the axiom of Greek philosophy. Plato had managed by making his ideas analogous to the change-resistant geometric formula; Democritus had managed by making his atoms indivisible analogous to the points on a geometric line. Aristotle, however, did not take his model from the abstract world of mathematics and ideal contemplation. The son of a Macedon court physician and trained in medicine, he had learned the hard way that you snub bedside observation and ignore bodily change at your peril. Instead, he took his paradigm from the material and highly active forms of the living being. But where would he find the unchangeable aspect in the ever-changing activity of living beings?

Aristotle found it in the natural tasks the living beings have to perform to fulfill their nature, *i.e.*, to remain living beings of their kind, feeding being the first paradigmatic case. The ongoing performance is ever changing, true, but the task and its goal (*telos*) remain invariably the same. Everything is on the move from *potentiality* to *actuality*, aiming for a future goal, a *final cause*; and the *locomotion* from here to there has *a beginning, an end, and something in between*, which was how Aristotle defined an *epic* in *Poetics*, his famous work on the art of drama. And like all good plays, the natural tasks are re-enacted again and again. When the fox has fed, it has to feed again; the grass greens and withers with the seasons, over and over; when the acorns produce oaks, the oaks in turn produce acorns, and the circle is repeated. Life is repetition, circles within circles. It is not the still life circles of geometry, but the circles of real concrete life are world-constituting forms as good as the mathematician's timeless formulae and Plato's eternal ideas; you only have to follow them to their completion and closure to see their true nature.

A marine biologist by vocation (one legend tells he died during a dive), Aristotle did not make a distinction between the defining forms of biology and psychology, but named them all *psyches*. Thus, by identifying the defining form of life as the active striving towards a pre-given goal, ideally described in the vocabulary and subject-object grammar of ordinary language ( $S \rightarrow O$ ), *Aristotle had also identified the defining unit of psychology.*

The *psyches* he ordered into a taxonomic hierarchy like the major groups of living beings. Aristotle had no notion of evolution, but today we recognize his classificatory sequence as evolutionary. At the most fundamental level were the basic life functions shared by all living beings: Food intake and reproduction. Next followed functions shared by all animals: The ability to move about and to sense. Then followed functions particular to higher animals: The ability to imagine and have dreams during sleep. Finally at the top were functions specific and defining for

the human being: The ability to think and speak, and the ability—and need—to live in a society. As his battling peers had at least agreed that society was secondary to reason, Aristotle emphasized the distinction by calling us an animal with reason and language (*zoon logon echon*) and a societal animal (*zoon politikon*), respectively.

In scope and intention, *Aristotle's taxonomy is a general psychology*, laying out the architecture of the psychological domain from the simplest animal functions to the unique human traits. Since a general psychology is what we are presently missing, Kantor was certainly right when he said that our psychology had “*not yet fully caught up with Aristotle*.”<sup>5</sup>

If to Aristotle's architecture of general psychology we add his identification of the essential psychological unit ( $S \rightarrow O$ ), and his insistence that we need soul and body, both and together, the answer to Koch's hidden-figure-puzzle should be within reach. The solution to the crisis of psychology should be as simple as could possibly be: *We just have to catch up with Aristotle!*

If it was that simple, of course, there would have been no crisis in the first place. But, as Aristotle underlined in *Poetics*, still used as textbook by Hollywood screenwriters dreaming of producing blockbusters, a crisis is essential in any good drama.<sup>6</sup> The crisis in the epic drama of psychology came with the downfall of Aristotle. As in the best Greek plays, he brought it upon himself.

## Enlightenment

How Aristotle around 300 BC could found so many sciences is best explained by an analogy. Like the great French *Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers* was the accumulated product of the *French Enlightenment*, its clone, the *Encyclopædia Britannica*, the product of the *Scottish Enlightenment*, Aristotle's remarkable scientific corpus was the product of the *Greek Enlightenment*. Aristotle, and his school, was standing upon the shoulders of previous generations of scholars, as he himself acknowledged: “Let us remember that we should not disregard the experience of ages; in the multitude of years these things, if they were good, would certainly not have been unknown; for almost everything has been found out, although sometimes they are not put together; in other cases men do not use the knowledge which they have.”<sup>7</sup>

*Enlightenment* is the call for knowledge and emancipation, and the belief that the first will bring the second; “daring to know,” is how Immanuel Kant defined it.<sup>8</sup> It is

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<sup>5</sup>Kantor (1963, p. 149).

<sup>6</sup>Tierno (2002).

<sup>7</sup>Aristotle, *Politics*, Book 2, part 5.

<sup>8</sup>Kant (1784).

the claim that you can take fate into your own hands and by your own efforts become what you truly are, as iconically expressed in Pico della Mirandola's *Oration to Man*, called the *Manifesto of the Renaissance*, which renders it as God's promise to Adam: "The nature of all other beings is limited and constrained within laws prescribed by Us. Thou, constrained by no limits, in accordance with thy own free will, in whose hand We have placed thee, shalt ordain for thyself the limit of thy nature."<sup>9</sup> Or, as Erasmus of Rotterdam expressed it 50 years later: "Now it is the possession of Reason which constitutes a Man. If trees and wild beasts grow, men, believe me, are fashioned." Education and learning are how we make ourselves. "If it be contrived earnestly and wisely, you have, I had almost said, what prove a being not far from God."<sup>10</sup>

Conventionally the term has been reserved for the period from 1690 to 1789, but the Italian Renaissance and the Dutch Humanism were also Enlightenment events, and similar surges in science, culture, and calls for social reform and democracy have occurred throughout history whenever trading wealth made urban mercantile classes strong enough to challenge and overthrow their feudal overlords. After the revolution—whether the new rulers remained in control, the old rulers made a comeback, or a combination—the Enlightenment event as a rule came to pass.

The first outbreak took place in ancient Greece, when Athens rose to become the center of a commercial empire, and a market for learning and intellectual skills developed. On the Athenian silver coin was an impression of Athena's wide-eyed owl, the symbol of wisdom and learning, and scholars and teachers all over Greece took the hint. In search of fame and silver owls, they flocked to the metropolis to offer their ideas and services, among them Democritus and his student Protagoras, a young mathematical prodigy Democritus had discovered and taken in from the street in Abdera. Good teachers beget good students, and good students veer, so when Democritus declared that "only atoms exist, the rest is opinion,"<sup>11</sup> Protagoras said, 'Fine, you take care of the atoms, Master, then I'll deal with opinion.' Setting up shop in Athens, he did. With the individual as his atom and calling *Man the measure of all things*, Protagoras became the leader of the Sophists—lovers of wisdom—and a founder of the cultural-historical sciences and the humanities. And when Plato, anti-materialist and anti-democrat, using Socrates as his literary mouthpiece, set out to demolish the two arms of Enlightenment, the Atomists and the Sophists, Aristotle, another wayward student, drew his own conclusions.

In Aristotle's day Greek democracy faltered and its Enlightenment event came to an end, but not least through the efforts of the Muslim scholar and fellow physician Averröes his work was saved and became a pillar in the next Enlightenment event, the cultural and scientific surge called the Islamic Golden

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<sup>9</sup>Pico (1486).

<sup>10</sup>Erasmus (1529).

<sup>11</sup>Diogenes Laërtius, *Life of Democritus*, XII.

Age.<sup>12</sup> From here, at the predawn of the Italian Renaissance, thanks to the commentaries of Averrões, Thomas Aquinas in 1200 made Aristotle chief philosopher in the Catholic Church, demoting Plato who had previously held that position. This, by the way, explains why Plato, Aristotle, and a turban clad Averrões, pagans all, came to figure in a central wall painting in the most holy temple of the Christian Church.<sup>13</sup>

Plato had ruled 800 years when unseated, Aristotle only 400. Contrary to Plato, who had denounced the material world as false and a no-go, Aristotle encouraged empirical studies of nature, and with this license science began to prosper, culminating with Galileo's scientific revolution in 1600, which axed Aristotle!

## Salto Mortale

The ( $S \rightarrow O$ ) form of the living being defines the living being, surely; but contrary to what Aristotle believed, it does not define everything else as well. Orbiting planets and falling stones are not like animals aiming to reach future goals and fulfill natural tasks; the physical objects are reacting to the field of forces presently surrounding them, as Galileo could demonstrate. Animals have *locomotion* reaching out in time and space, but physical objects are determined by *local motion*, causal forces affecting their boundary and bound to the immediacy of the here and now.

Aristotle had over-generalized and made everything biological. Now Galileo over-generalized and made everything physical. Everything is physical, of course, but in addition, the living world is animated, and it is this *active* quality of life that Aristotle's concepts capture, and Galileo's *reactive* causality does not. For future reference, let us call it *Activity Theory* and *Reactivity Theory*.

Galileo's revolution has rightfully been called the decisive turning point in science as it opened up for the huge and still ongoing advances in the physical sciences. But it was also a turning point that sent psychology on a Diaspora from which it has yet to return.

Both paradigms—shown in Fig. 2.1 and to be further explained—are valid and necessary. To give to each his own, the physical to Galileo, the animate to Aristotle, would have seemed the sensible thing; in retrospect, however, the outcome was

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<sup>12</sup>As 101 Economy will tell you, the establishment of a common market, subject to common rules, and under the directorship and policing of a common authority, will greatly favor the expansion of trade and accumulation of wealth. Starting with an altercation between the merchant towns of Mecca and Medina in the 7th century, a new religious doctrine—*Islam*—accomplished precisely this, which led to an Enlightenment event that from a distance lent a shine to Europe's Dark Ages.

<sup>13</sup>Raphael's painting *The School in Athens* in the Apostolic Palace in the Vatican. Like a pictorial lexicon it depicts the major Greek philosophers. The lexicon is opened in my PowerPoint presentation, *The School in Athens* <http://engelsted.net/PPEnglish/TheSchoolinAthens/TheSchoolinAthens.htm>.

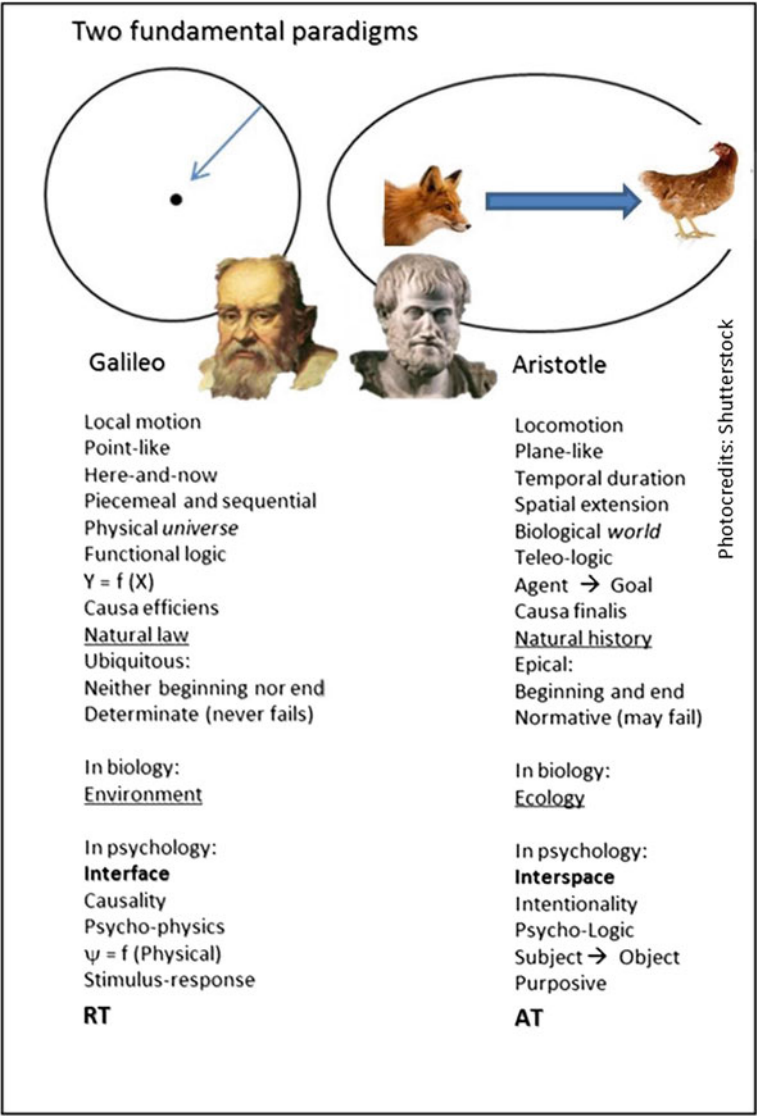


Fig. 2.1 Two fundamental paradigms

inevitable. It is in the nature of paradigmatic swings that winner takes all, as Thomas Kuhn would say. Besides, many wanted Aristotle out. Latin school boys—like Francis Bacon and John Locke of later Enlightenment fame—wanted to be freed of the boring and demanding Aristotelian syllabus; their bourgeois fathers wanted to get rid of the philosophical support Aristotle’s *Scala naturae* gave the feudal order. When given the chance, fathers and sons, therefore, opted for the

old-time Atomism now reincarnated in Galileo. The dazzling success of mechanical physics—sheer brilliance after Newton—made the choice easy, mandatory even. Anyway, Aristotle’s and Galileo’s seemed worlds too far apart to bridge. They even spoke different languages.

As an epic event with a beginning, an end, and something in between (Aristotle’s definition in *Poetics*), locomotion is ideally described in the vocabulary and subject–object grammar of ordinary language ( $S \rightarrow O$ ) evolved through time for precisely this purpose. Local motion requires a completely different language. Galileo: “It is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures, without which it is humanly impossible to understand a single word of it; without these, one is wandering about in a dark labyrinth.”<sup>14</sup> What would capture local motion was not meaningful words, but the causal function,  $y = f(x)$ , as Galileo showed with his fall law. And while law is law and brooks no exception, epic events have so many ways to go wrong between the beginning and the end that they can be only norms.

You would not be a self-respecting intellectual if you did not prefer mathematical clarity over word play and the precision of law over the elusiveness of norm; so long before Kurt Lewin made this call, young bright heads were demanding a psychology to follow the Galilean precepts. Not so young also, as for instance Thomas Hobbes of English Enlightenment fame.

Hobbes had visited Galileo in Pisa and become a passionate fan. On his return, he squashed Aristotle—the most ridiculous he had ever read<sup>15</sup>—and founded psychology anew based on Galileo’s mechanical principles, for which he has been called “the father of modern empirical psychology.”<sup>16</sup>

According to our official history, psychology as science was founded by Wilhelm Wundt in 1879. It is not wrong, but fails to mention that it was only the third time in history psychology was founded; that there were three different psychologies simultaneously founded in the 1870s; and that Wundt himself had to found two distinctively different psychologies. It seems like chaos, but there is order in the madness. What we see are the after quakes following the shock of the Aristotle–Galileo rupture, which marks a Ground Zero in the history of psychology, in the history of Western thought as well. The story is quickly told.

## The Classical Philosophical Cascade

With Hobbes’ second founding, humans were now to be understood as machines with input and output, usually called stimulus and response ( $s \rightarrow r$ ). First, we were compared to mechanical precision clocks; then, as the program progressed, with the

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<sup>14</sup>Galileo (1623, p. 4).

<sup>15</sup>Hobbes (1651, p. 672).

<sup>16</sup>Brandt (1928, p. 151).



top machines of the subsequent industrial revolutions; with the first industrial revolution we became like steam engines, with the second like telephone exchanges, with the third like computers, and with the fourth currently under way like the Internet.

There were objections right away. The naturalist John Ray, called the Aristotle of England, protested that “[t]hese Mechanick Philosophers” cannot explain animals “from the necessary Motion of Matter, unguided by Mind for End,”<sup>17</sup> but he was put down with ridicule by his Royal Society colleague Robert Boyle. An Atomist insisting that reality should be stripped down to those “grand and most catholick principles of bodies, matter and motion,”<sup>18</sup> Boyle cruelly compared Ray to the ignorant Chinese savages who had believed that mechanical clocks were European animals with souls. Boyle was adamant, as was Hobbes, that no ghosts should be allowed in the machine, and that applied to René Descartes as well. The Frenchman had his doubts too, and to appease them had turned humans into machines with souls, but when scrutinized, his solution of psycho-physical interaction proved unintelligible, and rejected were also the even weirder solutions of psycho-physical parallelism that followed in the desperate attempts to both keep the psychological ( $\Psi$ ) and square it with the physical (P).

There were, however, problems the Mechanick Philosophers could not so easily dismiss. Already Democritus recognized that sensory experience has features with no equivalent in the physicist’s universe of bodies in motion. Galileo put it succinctly: “I think that tastes, odors, colors, and so on are no more than mere names so far as the object in which we locate them are concerned, and that they reside in consciousness. Hence if the living creature were removed, all these qualities would be wiped away and annihilated.”<sup>19</sup>

Hobbes agreed and called these subjective qualities “the great deception of sense.”<sup>20</sup> That the mind creates such sensory qualities on its own is secondary, said now John Locke; the primary is that mind is also informing us about the objective world of bodies, matter, and motion, which physics deals in. As the two works Locke brought home from exile at the conclusion of the English Glorious Revolution, one on government and one on psychology, had made him *Mr. Enlightenment* to the European intelligentsia,<sup>21</sup> people felt suitably calmed by this neat distinction between *primary* and *secondary* sense qualities.

Not so fast, retorted Anglo-Irish George Berkeley; in a brilliant pioneering study in the psychology of perception, he demonstrated that Locke’s primary qualities were just as much subjective fabrications as the secondary. In other words, from the

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<sup>17</sup>Ray (1701).

<sup>18</sup>Robert Boyle/Le Van Baumer (1978, p. 312).

<sup>19</sup>Galileo (1623, p. 23).

<sup>20</sup>Hobbes (1640).

<sup>21</sup>“Perhaps no man ever had a more judicious or more methodical genius,” the French savant Voltaire wrote of Locke in his *English Letters* no XIII, himself an icon of the (official) *Enlightenment Era*, which is customarily dated from the publication of Locke’s books in 1690 to the French Revolution in 1789.

sensory interface we cannot know the outer world of objects moving in time and space, and yet we do unquestionably know it. Using this remarkable conclusion to create an ingenious proof of the existence of God—Berkeley belonged to the counter revolution, which has followed most revolutions and as a rule turns off again the lights of Enlightenment—he was rewarded with a bishopric.

Dismissing the part about God, David Hume of the illustrious Scottish Enlightenment accepted as valid the conclusion that by the senses and induction, we cannot know with certainty what we do know. Ironical and shocking, the empiricism of the physicists could not vouch for the ontology of the physicists.

Reading Hume shook Immanuel Kant out of his “dogmatic slumber,” as he admitted.<sup>22</sup> Hume had thrown up his hands; Kant, a teacher of the new physics and a devotee of Newton, did not. A radical solution had to be found, and he found it: “Hitherto it has been assumed that all our knowledge must conform to objects, [let us instead] suppose that objects must conform to our knowledge.”<sup>23</sup> The ontology could be made safe and certain if we just moved it from the outer to the inner world. The matrix of space, time, and moving bodies is simply the mind’s own *a priori* format of intuition, the form the sensory input has to take when entering the mind, just like a liquid takes the form of the bottle it is poured into. As it reversed everything, Kant called the solution his Copernican revolution. With Kant, classical philosophy is brought to its conclusion.<sup>24</sup> Philosophy after Kant ceases to be a frontrunner of science to become its self-appointed—and not always appreciated—overseer. Having said that, post-Kantian philosophy still had a gift or two to give psychology.

## The Third Founding of Psychology and Its Different Faces

The first casualty of Kant’s revolution was psychology. The task of a scientific psychology is to find a place for mind in the structure of the world; if the world structure itself is in the mind that obviously becomes impossible. Besides, said Kant, to be scientific, psychology must be renderable in mathematical equations, which it is not. As Kant was the leading light of the German Enlightenment, everybody listened, and psychology was stomped. But only for 50 years, then a mad German physicist, G.T. Fechner, did produce a psycho-physical equation, and the game was on again.

It is a most curious story and proves that counter revolution can be revolutionary too, counter-Enlightenment enlightening. When the French Revolution turned into counter revolution and the promises of Napoleon were dashed, dashed were also the

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<sup>22</sup>Kant (1783).

<sup>23</sup>Kant (1781/1787).

<sup>24</sup>For a short Power Point presentation see Classical Philosophy Ultrashort Version [www.engelsted.net/E-philosophy.htm](http://www.engelsted.net/E-philosophy.htm).

hopes of the German intellectuals and liberal bourgeoisie. As they resigned themselves to continued aristocratic rule, the general mood shifted. Turning away from worldly politics and hard science, which, in the words of Madame de Staël, “can only examine by division, [and] applies like a dissecting knife to dead nature, but ... is a bad instrument to teach us to understand what is living,”<sup>25</sup> people turned to their inner life and embraced a New Age palette of art and poetry, spiritualism, vitalism, and pantheism. *German Romanticism*, it is called.

Today its stance would be called anti-scientific, but German Romanticism did in fact make an important contribution to scientific progress, as its cavalierly largesse with spiritual phenomena proved a boon to scientific fields cramped by the strictures of the hegemonic mechanical physics. It licensed Luigi Galvani’s discovery of ‘animal’ electricity, for instance; and when H.C. Oersted discovered electromagnetism, he later referred to it as *The Spirit in Nature*.

Psychology was released too in a couple of steps. The notion of special spiritual energies—a specific nerve energy for each sensory modality—had informed the experimental laboratory work that earned the Berlin professor Johannes Müller the title of founder of modern physiology. When four of his best students, led by towering Ludwig von Helmholtz, in 1845 took down the spiritual scaffold again and—swearing an oath never to accept any other forces in the organism than the common physical chemical<sup>26</sup>—restored a rigid natural science outlook, the building stood solidly on its own. The four oath-swearing students—Helmholtz, du Bois-Reymond, Carl Ludwig, and Ernst Brücke—read like the blue book of physiology, but also the pedigree of psychology. It was the students taught by Müller’s students, who became the founding fathers of scientific psychology.

Fechner was the last leg of the Romanticist movement, and probably mad as a hatter. He believed in a pan-psychic unity of spirit and matter, and was desperate to find a formula to open peoples’ eyes to this true reality. Having hurt his own eyes studying the sun, and moving along a path from a depressive stupor to religious euphoria, he discovered the formula that was to make him famous, in his bed October 22, 1850. It was first laid out in the book *Zend-Avesta or Concerning Matters of Heaven and the Hereafter* published under a pseudonym in 1851, but after a lot of experimental work, and in a more academic guise, it was republished in 1860 as *Elements of Psycho-Physics* and immediately set off a revolution.

Fechner’s formula demonstrated that the experienced magnitude of sensation is a logarithmic function of the magnitude of the physical stimulus:  $\Psi = k \log s$ .<sup>27</sup> As this broke Kant’s ban by proving that functional mathematical relationships between the *psychological* and the *physical*,  $\Psi = f(P)$ , could be found, the German sensory physiologists and physicists went to work in psycho-physical laboratories to find them. Next their students, using the same formula, founded psychology for the third time in their own psycho-physical laboratories.

<sup>25</sup>Madame de Staël (1814) and Le Van Baumer (1978, p. 475).

<sup>26</sup>Boring (1950, p. 708).

<sup>27</sup>In German  $S = k \log R$ .

First out of the box was the Russian Ivan Sechenov, but Wilhelm Wundt, his roommate during their studies with Hermann von Helmholtz, was close on his heels. Wundt was subsequently awarded the laurels, but only because Germany by now was the leader in industry and science and imitated by everybody.

Perhaps this was unfortunate because Sechenov's psychology was the more advanced. By this time, Russia was warming up to its first bourgeois revolution, and an Enlightenment event was finally in the pipeline. While first movers end up struggling with antiquated models, late comers have access to the state of the art, and that was to Sechenov's advantage. True to the revolutionary spirit, he opted for a no-nonsense objective psychology based on stimulus-response; "the initial cause of any action always lies in external sensory stimulation," he insisted.<sup>28</sup> It was pure Hobbes, but Hobbes upgraded with the newest science, not least brain physiology to which Sechenov himself greatly contributed. He laid the ground for the succeeding Reflexologies of Ivan Pavlov and Vladimir Bekhterev, and, through these, also the American Behaviorism of J.B. Watson.

If Sechenov was Hobbes upgraded, Wundt was Locke put in Teutonic order. Wundt wanted to do for the mind what Mendeleev had just done for chemistry, identify and order the elements of subjective experience using the psycho-physical methodology and introspection. It was a psychology of limited scope; the visiting American William James said it could only have been invented in a country where people were incapable of being bored.<sup>29</sup> Wundt, however, recognized that and became—in one very German body—his own Democritus and Protagoras both. Having given the 'atoms' their due, he went to work on the 'opinions' and founded *Völkerpsychologie*, the cultural-historical psychology that studied higher mental processes as expressed in religion, social customs, myths, history, language, arts, and law. Wundt's two psychologies correspond to the much advertised partition between natural science, which explains, and humanist science, which understands. Launched and reinforced by the German William Dilthey, it led to C.P. Snow's 'two cultures'—never shall they meet—and is, of course, disastrous for the prospects of psychology, which needs both these realities in the same picture (Fig. 2.2).

There was a third founder as well at this time, and he nearly got it right. As a former Catholic priest with a scholastic education, Franz Brentano had written his dissertation on Aristotle, and with reference to the Greek sage, he now made intentionality defining of psychology: "Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object, and what we might call [...] reference to a content, direction towards an object (which is not to be understood here as meaning a thing), or immanent objectivity [...]. No physical phenomenon exhibits anything like it."<sup>30</sup>

<sup>28</sup>Sechenov (1863/1965, pp. 88–89).

<sup>29</sup>James (1890, p. 192).

<sup>30</sup>Brentano (1874, pp. 115–116).

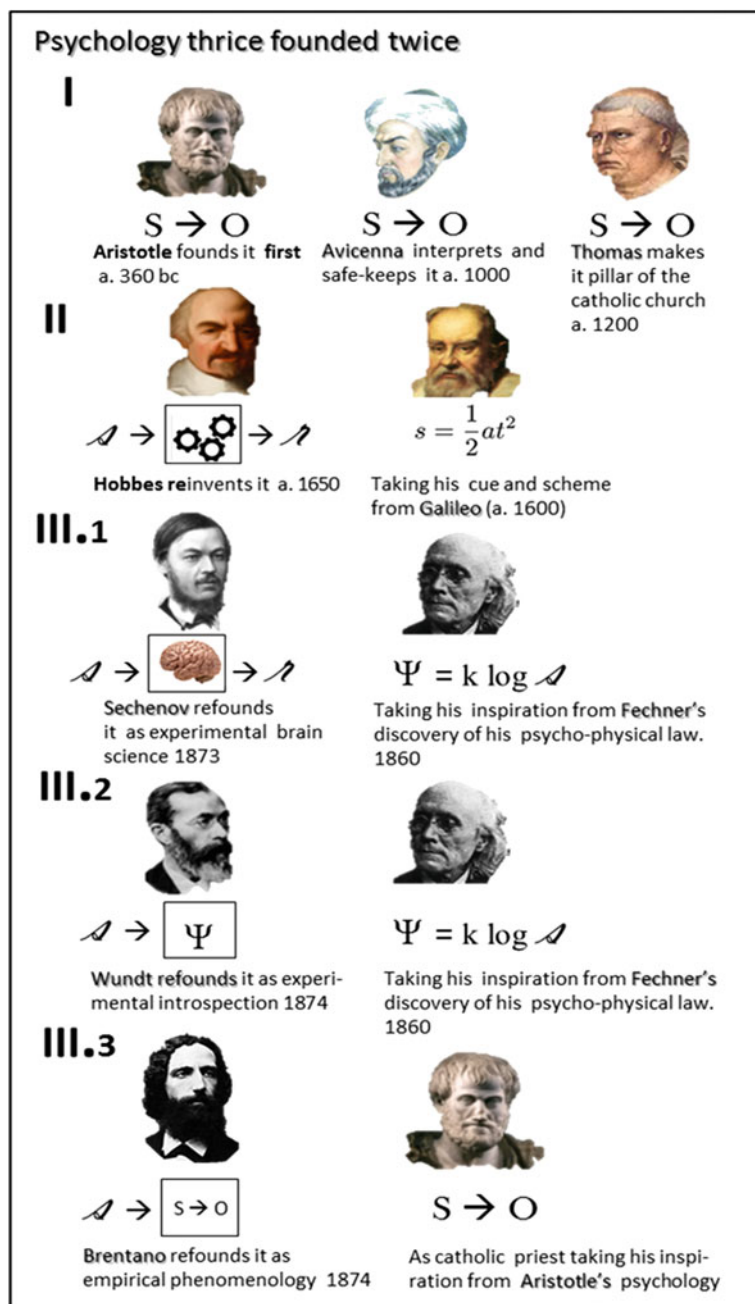


Fig. 2.2 Psychology thrice founded twice

Immanent objectivity was Kant's solution too, only using other words; but whereas his was an a priori format of reception, ( $s \rightarrow r$ ), Brentano's was an outreaching towards an object ( $S \rightarrow O$ ). The title of Brentano's major work made clear, however, that this intentionality should still be seen as experience, "from an empirical standpoint." In other words, ( $S \rightarrow O$ ) should proceed from ( $s \rightarrow r$ ), Galileo remains the law of the land, and empiricism reign with its concomitant subjectivity.

So exasperating close Brentano was, and even closer his student Alexei Meinong with his very perceptive theory of objects, but also Edmund Husserl with his Phenomenology, and his student Martin Heidegger with his Being and Time. Notwithstanding the keen insights of the Phenomenologists, however, psychology gets nowhere if it remains locked up inside the cocoon of subjectivity. Unless it touches base outside the mental it all too easily reduces to subjectivist philosophy in one of its many bottlings; cosmogenesis alone demands that psychology stands on physics as this came first in time. For these reasons, it was entirely understandable that the psychology mainstream followed the Galilean highway into behaviorism, cognitivism, and brain science.

## Sine Qua Non

Only it was the wrong direction, some of us thought. Dedicated materialists and biologists as we were, the phenomenological incarceration had not been in vain. However, barren the Copenhagen approach, you could not dump phenomenology. Psychology must be materialistic and tie into the physical world, and it must be biological and tie into the living world, but if about anything, psychology is about *the subject* and *the subject's being in the world*. Psychology is the special science of *epistemics*; that is, the ways the world can be known to beings to which the world can be known; knowing understood in the widest sense, including the cognitive, but also the conative and emotive. Inseparable from the material and living world, psychology must be *real* phenomenology, epistemology *naturalized*. Aristotle got that right; the Copenhagen school did not, and was reduced to vapid philosophy. It should be fixable, though, if only a serviceable bridge back to Aristotle could be found.

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