CHAPTER VI

The *Vita Activa* and the Modern Age

Er hat den archimedischen Punkt gefunden, hat ihn aber gegen sich ausgenutzt, offenbar hat er ihn nur unter dieser Bedingung finden dürfen.

(He found the Archimedean point, but he used it against himself; it seems that he was permitted to find it only under this condition.)

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WORLD ALIENATION

Three great events stand at the threshold of the modern age and determine its character: the discovery of America and the ensuing exploration of the whole earth; the Reformation, which by expropriating ecclesiastical and monastic possessions started the twofold process of individual expropriation and the accumulation of social wealth; the invention of the telescope and the development of a new science that considers the nature of the earth from the viewpoint of the universe. These cannot be called modern events as we know them since the French Revolution, and although they cannot be explained by any chain of causality, because no event can, they are still happening in an unbroken continuity, in which precedents exist and predecessors can be named. None of them exhibits the peculiar character of an explosion of undercurrents which, having gathered their force in the dark, suddenly erupt. The names we connect with them, Galileo Galilei and Martin Luther and the great seafarers, explorers, and adventurers in the age of discovery, still belong to a premodern world. Moreover, the strange pathos of novelty, the almost violent insistence of nearly

all the great authors, scientists, and philosophers since the seventeenth century that they saw things never seen before, thought thoughts never thought before, can be found in none of them, not even in Galileo.[1] These precursors are not revolutionists, and their motives and intentions are still securely rooted in tradition.

In the eyes of their contemporaries, the most spectacular of these events must have been the discoveries of unheard-of continents and undreamed-of oceans; the most disturbing might have been the Reformation's irremediable split of Western Christianity, with its inherent challenge to orthodoxy as such and its immediate threat to the tranquillity of men's souls; certainly the least noticed was the addition of a new implement to man's already large arsenal of tools, useless except to look at the stars, even though it was the first purely scientific instrument ever devised. However, if we could measure the momentum of history as we measure natural processes, we might find that what originally had the least noticeable impact, man's first tentative steps toward the discovery of the universe, has constantly increased in momentousness as well as

1. The term *scienza nuova* seems to occur for the first time in the work of the sixteenth-century Italian mathematician Niccolò Tartaglia, who designed the new science of ballistics which he claimed to have discovered because he was the first to apply geometrical reasoning to the motion of projectiles. (I owe this information to Professor Alexandre Koyré.) Of greater relevance in our context is that Galileo, in the *Sidereus Nuncius* (1610), insists on the "absolute novelty" of his discoveries, but this certainly is a far cry from Hobbes's claim that political philosophy was "no older than my own book *De Cive*" (*English Works*, ed. Molesworth [1839], I, ix) or Descartes' conviction that no philosopher before him had succeeded in philosophy ("Lettre au traducteur pouvant servir de préface" for *Les principes de la philosophie*). From the seventeenth century on, the insistence on absolute novelty and the rejection of the whole tradition became commonplace. Karl Jaspers (*Descartes und die Philosophie* [2d ed.; 1948], pp. 61 ff.) stresses the difference between Renaissance philosophy, where "Drang nach Geltung der originalen Persönlichkeit . . . das Neusein als Auszeichnung verlangte," and modern science, where "sich das Wort 'neu' als sachliches Wertpraedikat verbreitet." In the same context, he shows how different in significance the claim to novelty is in science and philosophy. Descartes certainly presented his philosophy as a scientist may present a new scientific discovery. Thus, he writes as follows about his "considérations": "Je ne mérite point plus de gloire de les avoir trouvées, que ferait un passant d'avoir rencontré par bonheur à ses pieds quelque riche trésor, que la diligence de plusieurs aurait inutilement cherché longtemps auparavant" (*La recherche de la vérité* [Pléiade ed.], p. 669).

speed until it has eclipsed not only the enlargement of the earth's surface, which found its final limitation only in the limitations of the globe itself, but also the still apparently limitless economic accumulation process.

But these are mere speculations. As a matter of fact, the discovery of the earth, the mapping of her lands and the chartering of her waters, took many centuries and has only now begun to come to an end. Only now has man taken full possession of his mortal dwelling place and gathered the infinite horizons, which were temptingly and forbiddingly open to all previous ages, into a globe whose majestic outlines and detailed surface he knows as he knows the lines in the palm of his hand. Precisely when the immensity of available space on earth was discovered, the famous shrinkage of the globe began, until eventually in our world (which, though the result of the modern age, is by no means identical with the modern age's world) each man is as much an inhabitant of the earth as he is an inhabitant of his country. Men now live in an earth-wide continuous whole where even the notion of distance, still inherent in the most perfectly unbroken contiguity of parts, has yielded before the onslaught of speed. Speed has conquered space; and though this conquering process finds its limit at the unconquerable boundary of the simultaneous presence of one body at two different places, it has made distance meaningless, for no significant part of a human life—years, months, or even weeks—is any longer necessary to reach any point on the earth.

Nothing, to be sure, could have been more alien to the purpose of the explorers and circumnavigators of the early modern age than this closing-in process; they went to enlarge the earth, not shrink her into a ball, and when they submitted to the call of the distant, they had no intention of abolishing distance. Only the wisdom of hindsight sees the obvious, that nothing can remain immense if it can be measured, that every survey brings together distant parts and therefore establishes closeness where distance ruled before. Thus the maps and navigation charts of the early stages of the modern age anticipated the technical inventions through which all earthly space has become small and close at hand. Prior to the shrinkage of space and the abolition of distance through railroads, steamships, and airplanes, there is the infinitely greater and more

effective shrinkage which comes about through the surveying capacity of the human mind, whose use of numbers, symbols, and models can condense and scale earthly physical distance down to the size of the human body's natural sense and understanding. Before we knew how to circle the earth, how to circumscribe the sphere of human habitation in days and hours, we had brought the globe into our living rooms to be touched by our hands and swirled before our eyes.

There is another aspect of this matter which, as we shall see, will be of greater importance in our context. It is in the nature of the human surveying capacity that it can function only if man disentangles himself from all involvement in and concern with the close at hand and withdraws himself to a distance from everything near him. The greater the distance between himself and his surroundings, world or earth, the more he will be able to survey and to measure and the less will worldly, earth-bound space be left to him. The fact that the decisive shrinkage of the earth was the consequence of the invention of the airplane, that is, of leaving the surface of the earth altogether, is like a symbol for the general phenomenon that any decrease of terrestrial distance can be won only at the price of putting a decisive distance between man and earth, of alienating man from his immediate earthly surroundings.

The fact that the Reformation, an altogether different event, eventually confronts us with a similar phenomenon of alienation, which Max Weber even identified, under the name of "innerworldly asceticism," as the innermost spring of the new capitalist mentality, may be one of the many coincidences that make it so difficult for the historian not to believe in ghosts, demons, and *Zeitgeists.* What is so striking and disturbing is the similarity in utmost divergence. For this innerworldly alienation has nothing to do, either in intent or content, with the alienation from the earth inherent in the discovery and taking possession of the earth. Moreover, the innerworldly alienation whose historical factuality Max Weber demonstrated in his famous essay is not only present in the new morality that grew out of Luther's and Calvin's attempts to restore the uncompromising otherworldliness of the Christian faith; it is equally present, albeit on an altogether different level, in the expropriation of the peasantry, which was the unforeseen conse-

quence of the expropriation of church property and, as such, the greatest single factor in the breakdown of the feudal system.[2] It is, of course, idle to speculate on what the course of our economy would have been without this event, whose impact propelled Western mankind into a development in which all property was destroyed in the process of its appropriation, all things devoured in the process of their production, and the stability of the world undermined in a constant process of change. Yet, such speculations are meaningful to the extent that they remind us that history is a story of events and not of forces or ideas with predictable courses. They are idle and even dangerous when used as arguments against reality and when meant to point to positive potentialities and alternatives, because their number is not only indefinite by definition but they also lack the tangible unexpectedness of the event, and compensate for it by mere plausibility. Thus, they remain sheer phantoms no matter in how pedestrian a manner they may be presented.

In order not to underestimate the momentum this process has reached after centuries of almost unhindered development, it may be well to reflect on the so-called "economic miracle" of postwar Germany, a miracle only if seen in an outdated frame of reference. The German example shows very clearly that under modern conditions the expropriation of people, the destruction of objects, and the devastation of cities will turn out to be a radical stimulant for a process, not of mere recovery, but of quicker and more efficient accumulation of wealth—if only the country is modern enough to respond in terms of the production process. In Germany, outright destruction took the place of the relentless process of depreciation of all worldly things, which is the hallmark of the waste economy

2. This is not to deny the greatness of Max Weber's discovery of the enormous power that comes from an otherworldliness directed toward the world (see "Protestant Ethics and the Spirit of Capitalism," in *Religionssoziologie* [1920], Vol. I). Weber finds the Protestant work ethos preceded by certain traits of monastic ethics, and one can indeed see a first germ of these attitudes in Augustine's famous distinction between *uti* and *frui*, between the things of this world which one may use but not enjoy and those of the world to come which may be enjoyed for their own sake. The increase in power of man over the things of this world springs in either case from the distance which man puts between himself and the world, that is, from world alienation.

in which we now live. The result is almost the same: a booming prosperity which, as postwar Germany illustrates, feeds not on the abundance of material goods or on anything stable and given but on the process of production and consumption itself. Under modern conditions, not destruction but conservation spells ruin because the very durability of conserved objects is the greatest impediment to the turnover process, whose constant gain in speed is the only constancy left wherever it has taken hold.[3]

We saw before that property, as distinguished from wealth and appropriation, indicates the privately owned share of a common world and therefore is the most elementary political condition for man's worldliness. By the same token, expropriation and world alienation coincide, and the modern age, very much against the intentions of all the actors in the play, began by alienating certain strata of the population from the world. We tend to overlook the central importance of this alienation for the modern age because we usually stress its secular character and identify the term secularity with worldliness. Yet secularization as a tangible historical event means no more than separation of Church and State, of religion and politics, and this, from a religious viewpoint, implies a return to the early Christian attitude of "Render unto Caesar the things that are Caesar's and unto God the things that are God's" rather than a loss of faith and transcendence or a new and emphatic interest in the things of this world.

Modern loss of faith is not religious in origin—it cannot be traced to the Reformation and Counter Reformation, the two great religious movements of the modern age—and its scope is by no means restricted to the religious sphere. Moreover, even if we admitted that the modern age began with a sudden, inexplicable

3. The reason most frequently given for the surprising recovery of Germany —that she did not have to carry the burden of a military budget—is inconclusive on two accounts: first, Germany had to pay for a number of years the costs of occupation, which amounted to a sum almost equal to a full-fledged military budget, and second, war production is held in other economies to be the greatest single factor in the postwar prosperity. Moreover, the point I wish to make could be equally well illustrated by the common and yet quite uncanny phenomenom that prosperity is closely connected with the "useless" production of means of destruction, of goods produced to be wasted either by using them up in destruction or—and this is the more common case—by destroying them because they soon become obsolete.

eclipse of transcendence, of belief in a hereafter, it would by no means follow that this loss threw man back upon the world. The historical evidence, on the contrary, shows that modern men were not thrown back upon this world but upon themselves. One of the most persistent trends in modern philosophy since Descartes and perhaps its most original contribution to philosophy has been an exclusive concern with the self, as distinguished from the soul or person or man in general, an attempt to reduce all experiences, with the world as well as with other human beings, to experiences between man and himself. The greatness of Max Weber's discovery about the origins of capitalism lay precisely in his demonstration that an enormous, strictly mundane activity is possible without any care for or enjoyment of the world whatever, an activity whose deepest motivation, on the contrary, is worry and care about the self. World alienation, and not self-alienation as Marx thought,[4] has been the hallmark of the modern age.

Expropriation, the deprivation for certain groups of their place

4. There are several indications in the writings of the young Marx that he was not altogether unaware of the implications of world alienation in capitalist economy. Thus, in the early article of 1842, "Debatten über das Holzdiebstahlsgesetz" (see *Marx-Engels Gesamtausgabe* [Berlin, 1932], Part 1, Vol. I, pp. 266 ff.), he criticizes a law against theft not only because the formal opposition of owner and thief leaves "human needs" out of account—the fact that the thief who uses the wood needs it more urgently than the owner who sells it—and therefore dehumanizes men by equating wood-user and wood-seller as wood proprietors, but also that the wood itself is deprived of its nature. A law which regards men only as property-owners considers things only as properties and properties only as exchange objects, not as use things. That things are denatured when they are used for exchange was probably suggested to Marx by Aristotle, who pointed out that though a shoe may be wanted for either usage or exchange, it is against the nature of a shoe to be exchanged, "for a shoe is not made to be an object of barter" (*Politics* 1257a8). (Incidentally the influence of Aristotle on the style of Marx's thought seems to me almost as characteristic and decisive as the influence of Hegel's philosophy.) However, such occasional considerations play a minor role in his work, which remained firmly rooted in the modern age's extreme subjectivism. In his ideal society, where men will produce as human beings, world alienation is even more present than it was before; for then they will be able to objectify (*vergegenständlichen*) their individuality, their peculiarity, to confirm and actualize their true being: "Unsere Produktionen wären ebensoviele Spiegel, woraus unser Wesen sich entgegen leuchtete" ("Aus den Exzerptheften" [1844–45], in *Gesamtausgabe*, Part 1, Vol. III, pp. 546–47).

in the world and their naked exposure to the exigencies of life, created both the original accumulation of wealth and the possibility of transforming this wealth into capital through labor. These together constituted the conditions for the rise of a capitalist economy. That this development, started by expropriation and fed upon it, would result in an enormous increase in human productivity was manifest from the beginning, centuries before the industrial revolution. The new laboring class, which literally lived from hand to mouth, stood not only directly under the compelling urgency of life's necessity[5] but was at the same time alienated from all cares and worries which did not immediately follow from the life process itself. What was liberated in the early stages of the first free laboring class in history was the force inherent in "labor power," that is, in the sheer natural abundance of the biological process, which like all natural forces—of procreation no less than of laboring—provides for a generous surplus over and beyond the reproduction of young to balance the old. What distinguishes this development at the beginning of the modern age from similar occurrences in the past is that expropriation and wealth accumulation did not simply result in new property or lead to a new redistribution of wealth, but were fed back into the process to generate further expropriations, greater productivity, and more appropriation.

In other words, the liberation of labor power as a natural process did not remain restricted to certain classes of society, and appropriation did not come to an end with the satisfaction of wants and desires; capital accumulation, therefore, did not lead to the stagnation we know so well from rich empires prior to the modern age, but spread throughout the society and initiated a steadily increasing flow of wealth. But this process, which indeed is the "life process of society," as Marx used to call it, and whose wealth-producing capacity can be compared only with the fertility of natural processes where the creation of one man and one woman would suffice to produce by multiplication any given number of human beings, remains bound to the principle of world alienation from

5. This of course is markedly different from present conditions, where the day laborer has already become a weekly wage-earner; in a probably not very distant future the guaranteed annual wage will do away with these early conditions altogether.

which it sprang; the process can continue only provided that no worldly durability and stability is permitted to interfere, only as long as all worldly things, all end products of the production process, are fed back into it at an ever-increasing speed. In other words, the process of wealth accumulation, as we know it, stimulated by the life process and in turn stimulating human life, is possible only if the world and the very worldliness of man are sacrificed.

The first stage of this alienation was marked by its cruelty, the misery and material wretchedness it meant for a steadily increasing number of "labouring poor," whom expropriation deprived of the twofold protection of family and property, that is, of a family-owned private share in the world, which until the modern age had housed the individual life process and the laboring activity subject to its necessities. The second stage was reached when society became the subject of the new life process, as the family had been its subject before. Membership in a social class replaced the protection previously offered by membership in a family, and social solidarity became a very efficient substitute for the earlier, natural solidarity ruling the family unit. Moreover, society as a whole, the "collective subject" of the life process, by no means remained an intangible entity, the "communist fiction" needed by classical economics; just as the family unit had been identified with a privately owned piece of the world, its property, society was identified with a tangible, albeit collectively owned, piece of property, the territory of the nation-state, which until its decline in the twentieth century offered all classes a substitute for the privately owned home of which the class of the poor had been deprived.

The organic theories of nationalism, especially in its Central European version, all rest on an identification of the nation and the relationships between its members with the family and family relationships. Because society becomes the substitute for the family, "blood and soil" is supposed to rule the relationships between its members; homogeneity of population and its rootedness in the soil of a given territory become the requisites for the nation-state everywhere. However, while this development undoubtedly mitigated cruelty and misery, it hardly influenced the process of expropriation and world alienation, since collective ownership, strictly speaking, is a contradiction in terms.

The decline of the European nation-state system; the economic and geographic shrinkage of the earth, so that prosperity and depression tend to become world-wide phenomena; the transformation of mankind, which until our own time was an abstract notion or a guiding principle for humanists only, into a really existing entity whose members at the most distant points of the globe need less time to meet than the members of a nation needed a generation ago—these mark the beginnings of the last stage in this development. Just as the family and its property were replaced by class membership and national territory, so mankind now begins to replace nationally bound societies, and the earth replaces the limited state territory. But whatever the future may bring, the process of world alienation, started by expropriation and characterized by an ever-increasing progress in wealth, can only assume even more radical proportions if it is permitted to follow its own inherent law. For men cannot become citizens of the world as they are citizens of their countries, and social men cannot own collectively as family and household men own their private property. The rise of society brought about the simultaneous decline of the public as well as the private realm. But the eclipse of a common public world, so crucial to the formation of the lonely mass man and so dangerous in the formation of the worldless mentality of modern ideological mass movements, began with the much more tangible loss of a privately owned share in the world.

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THE DISCOVERY OF THE ARCHIMEDEAN POINT

"Since a babe was born in a manger, it may be doubted whether so great a thing has happened with so little stir." These are the words with which Whitehead introduces Galileo and the discovery of the telescope on the stage of the "modern world."[6] Nothing in these words is an exaggeration. Like the birth in a manger, which spelled not the end of antiquity but the beginning of something so unexpectedly and unpredictably new that neither hope nor fear could have anticipated it, these first tentative glances into the uni-

6. A. N. Whitehead, *Science and the Modern World* (Pelican ed., 1926), p. 12.

verse through an instrument, at once adjusted to human senses and destined to uncover what definitely and forever must lie beyond them, set the stage for an entirely new world and determined the course of other events, which with much greater stir were to usher in the modern age. Except for the numerically small, politically inconsequential milieu of learned men—astronomers, philosophers, and theologians—the telescope created no great excitement; public attention was drawn, rather, to Galileo's dramatic demonstration of the laws of falling bodies, taken to be the beginning of modern natural science (although it may be doubted that by themselves, without being transformed later by Newton into the universal law of gravitation—still one of the most grandiose examples of the modern amalgamation of astronomy and physics—they would ever have led the new science on the path of astrophysics). For what most drastically distinguished the new world view not only from that of antiquity or the Middle Ages, but from the great thirst for direct experience in the Renaissance as well, was the assumption that the same kind of exterior force should be manifest in the fall of terrestrial and the movements of heavenly bodies.

Moreover, the novelty of Galileo's discovery was clouded by its close relationship to antecedents and predecessors. Not the philosophical speculations of Nicholas of Cusa and Giordano Bruno alone, but the mathematically trained imagination of the astronomers, Copernicus and Kepler, had challenged the finite, geocentric world view which men had held since time immemorial. Not Galileo but the philosophers were the first to abolish the dichotomy between one earth and one sky above it, promoting, as they thought, the earth "to the rank of the noble stars" and finding her a home in an eternal and infinite universe.[7] And it seems the astronomers needed no telescope to assert that, contrary to all sense experience, it is not the sun that moves around the earth but the earth that circles the sun. If the historian looks back upon these beginnings with all the wisdom and prejudices of hindsight, he is tempted to conclude that no empirical confirmation was needed to abolish the Ptolemaic system. What was wanted was, rather, the

7. I follow the excellent recent exposition of the interrelated history of philosophic and scientific thought in "the seventeenth century revolution" by Alexandre Koyré (*From the Closed World to the Infinite Universe* [1957], pp. 43 ff.).

speculative courage to follow the ancient and medieval principle of simplicity in nature—even if it led to the denial of all sense experience—and the great boldness of Copernicus' imagination, which lifted him from the earth and enabled him to look down upon her as though he actually were an inhabitant of the sun. And the historian feels justified in his conclusions when he considers that Galileo's discoveries were preceded by a "véritable retour à Archimède" which had been effective since the Renaissance. It certainly is suggestive that Leonardo studied him with passionate interest and that Galileo can be called his disciple.[8]

However, neither the speculations of philosophers nor the imaginings of astronomers has ever constituted an event. Prior to the telescopic discoveries of Galileo, Giordano Bruno's philosophy attracted little attention even among learned men, and without the factual confirmation they bestowed upon the Copernican revolution, not only the theologians but all "sensible men . . . would have pronounced it a wild appeal . . . of an uncontrolled imagination."[9] In the realm of ideas there are only originality and depth, both personal qualities, but no absolute, objective novelty; ideas come and go, they have a permanence, even an immortality of their own, depending upon their inherent power of illumination, which is and endures independently of time and history. Ideas, moreover, as distinguished from events, are never unprecedented, and empirically unconfirmed speculations about the earth's movement around the sun were no more unprecedented than contemporary theories about atoms would be if they had no basis in experiments and no consequences in the factual world.[10] What Galileo did and what nobody had done before was to use the telescope in such a

8. See P.-M. Schuhl, *Machinisme et philosophie* (1947), pp. 28–29.

9. E. A. Burtt, *Metaphysical Foundations of Modern Science* (Anchor ed.), p. 38 (cf. Koyré, *op. cit.*, p. 55, who states that Bruno's influence made itself felt "only after the great telescopic discoveries of Galileo").

10. The first "to save the phenomena by the assumption that the heaven is at rest, but that the earth revolves in an oblique orbit, while also rotating about its own axis" was Aristarchus of Samos in the third century B.C., and the first to conceive of an atomic structure of matter was Democritus of Abdera in the fifth century B.C. A very instructive account of the Greek physical world from the viewpoint of modern science is given by S. Sambursky, *The Physical World of the Greeks* (1956).

way that the secrets of the universe were delivered to human cognition "with the certainty of sense-perception";[11] that is, he put within the grasp of an earth-bound creature and its body-bound senses what had seemed forever beyond his reach, at best open to the uncertainties of speculation and imagination.

This difference in relevance between the Copernican system and Galileo's discoveries was quite clearly understood by the Catholic Church, which raised no objections to the pre-Galilean theory of an immobile sun and a moving earth as long as the astronomers used it as a convenient hypothesis for mathematical purposes; but, as Cardinal Bellarmine pointed out to Galileo, "to prove that the hypothesis . . . saves the appearances is not at all the same thing as to demonstrate the reality of the movement of the earth."[12] How pertinent this remark was could be seen immediately by the sudden change of mood which overtook the learned world after the confirmation of Galileo's discovery. From then on, the enthusiasm with which Giordano Bruno had conceived of an infinite universe, and the pious exultation with which Kepler had contemplated the sun, "the most excellent of all the bodies in the universe whose whole essence is nothing but pure light" and which therefore was to him the most fitting dwelling place of "God and the blessed angels,"[13] or the more sober satisfaction of Nicholas of Cusa of seeing the earth finally at home in the starred sky, were conspicuous by their absence. By "confirming" his predecessors, Galileo established a demonstrable fact where before him there were inspired speculations. The immediate philosophic reaction to this reality was not exultation but the Cartesian doubt by which modern philosophy—that "school of suspicion," as Nietzsche once called

11. Galileo (*op. cit.*) himself stressed this point: "Any one can know with the certainty of sense-perception that the moon is by no means endowed with a smooth and polished surface, etc." (quoted from Koyré, *op. cit.*, p. 89).

12. A similar stand was taken by the Lutheran theologian Osiander of Nuremberg, who wrote in an introduction to Copernicus' posthumous work, *On the Revolutions of Celestial Bodies* (1546): "The hypotheses of this book are not necessarily true or even probable. Only one thing matters. They must lead by computation to results that are in agreement with the observed phenomena." Both quotations are from Philipp Frank, "Philosophical Uses of Science," *Bulletin of Atomic Scientists*, Vol. XIII, No. 4 (April, 1957).

13. Burtt, *op. cit.*, p. 58.

it—was founded, and which ended in the conviction that "only on the firm foundation of unyielding despair can the soul's habitation henceforth be safely built."[14]

For many centuries the consequences of this event, again not unlike the consequences of the Nativity, remained contradictory and inconclusive, and even today the conflict between the event itself and its almost immediate consequences is far from resolved. The rise of the natural sciences is credited with a demonstrable, ever-quickening increase in human knowledge and power; shortly before the modern age European mankind knew less than Archimedes in the third century B.C., while the first fifty years of our century have witnessed more important discoveries than all the centuries of recorded history together. Yet the same phenomenon is blamed with equal right for the hardly less demonstrable increase in human despair or the specifically modern nihilism which has spread to ever larger sections of the population, their most significant aspect perhaps being that they no longer spare the scientists themselves, whose well-founded optimism could still, in the nineteenth century, stand up against the equally justifiable pessimism of thinkers and poets. The modern astrophysical world view, which began with Galileo, and its challenge to the adequacy of the senses to reveal reality, have left us a universe of whose qualities we know no more than the way they affect our measuring instruments, and—in the words of Eddington—"the former have as much resemblance to the latter as a telephone number has to a subscriber."[15] Instead of objective qualities, in other words, we find instruments, and instead of nature or the universe—in the words of Heisenberg—man encounters only himself.[16]

14. Bertrand Russell, "A Free Man's Worship," in *Mysticism and Logic* (1918), p. 46.

15. As quoted by J. W. N. Sullivan, *Limitations of Science* (Mentor ed.), p. 141.

16. The German physicist Werner Heisenberg has expressed this thought in a number of recent publications. For instance: "Wenn man versucht, von der Situation in der modernen Naturwissenschaft ausgehend, sich zu den in Bewegung geratenen Fundamenten vorzutasten, so hat man den Eindruck, . . . dass zum erstenmal im Laufe der Geschichte der Mensch auf dieser Erde nur noch sich selbst gegenübersteht . . . , dass wir gewissermassen immer nur uns selbst begegnen" (*Das Naturbild der heutigen Physik* [1955], pp. 17–18). Heisenberg's point is that the observed object has no existence independent of the observing

The point, in our context, is that both despair and triumph are inherent in the same event. If we wish to put this into historical perspective, it is as if Galileo's discovery proved in demonstrable fact that both the worst fear and the most presumptuous hope of human speculation, the ancient fear that our senses, our very organs for the reception of reality, might betray us, and the Archimedean wish for a point outside the earth from which to unhinge the world, could only come true together, as though the wish would be granted only provided that we lost reality and the fear was to be consummated only if compensated by the acquisition of supramundane powers. For whatever we do today in physics—whether we release energy processes that ordinarily go on only in the sun, or attempt to initiate in a test tube the processes of cosmic evolution, or penetrate with the help of telescopes the cosmic space to a limit of two and even six billion light years, or build machines for the production and control of energies unknown in the household of earthly nature, or attain speeds in atomic accelerators which approach the speed of light, or produce elements not to be found in nature, or disperse radioactive particles, created by us through the use of cosmic radiation, on the earth—we always handle nature from a point in the universe outside the earth. Without actually standing where Archimedes wished to stand (*dos moi pou stō*), still bound to the earth through the human condition, we have found a way to act on the earth and within terrestrial nature as though we dispose of it from outside, from the Archimedean point. And even at the risk of endangering the natural life process we expose the earth to universal, cosmic forces alien to nature's household.

While these achievements were anticipated by no one, and while most present-day theories flatly contradict those formulated during the first centuries of the modern age, this development itself was possible only because at the beginning the old dichotomy between earth and sky was abolished and a unification of the universe effected, so that from then on nothing occurring in earthly nature

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subject: "Durch die Art der Beobachtung wird entschieden, welche Züge der Natur bestimmt werden und welche wir durch unsere Beobachtungen verwischen" (*Wandlungen in den Grundlagen der Naturwissenschaft* [1949], p. 67).

was viewed as a mere earthly happening. All events were considered to be subject to a universally valid law in the fullest sense of the word, which means, among other things, valid beyond the reach of human sense experience (even of the sense experiences made with the help of the finest instruments), valid beyond the reach of human memory and the appearance of mankind on earth, valid even beyond the coming into existence of organic life and the earth herself. All laws of the new astrophysical science are formulated from the Archimedean point, and this point probably lies much farther away from the earth and exerts much more power over her than Archimedes or Galileo ever dared to think.

If scientists today point out that we may assume with equal validity that the earth turns around the sun or the sun turns around the earth, that both assumptions are in agreement with observed phenomena and the difference is only a difference of the chosen point of reference, it by no means indicates a return to Cardinal Bellarmine's or Copernicus' position, where the astronomers dealt with mere hypotheses. It rather signifies that we have moved the Archimedean point one step farther away from the earth to a point in the universe where neither earth nor sun are centers of a universal system. It means that we no longer feel bound even to the sun, that we move freely in the universe, choosing our point of reference wherever it may be convenient for a specific purpose. For the actual accomplishments of modern science this change from the earlier heliocentric system to a system without a fixed center is, no doubt, as important as the original shift from the geocentric to the heliocentric world view. Only now have we established ourselves as "universal" beings, as creatures who are terrestrial not by nature and essence but only by the condition of being alive, and who therefore by virtue of reasoning can overcome this condition not in mere speculation but in actual fact. Yet the general relativism that results automatically from the shift from a heliocentric to a centerless world view—conceptualized in Einstein's theory of relativity with its denial that "at a definite present instant all matter is simultaneously real"[17] and the concomitant, implied denial that Being which appears in time and space possesses an absolute reality—was already contained in, or at least

17. Whitehead, *op. cit.*, p. 120.

preceded by, those seventeenth-century theories according to which blue is nothing but a "relation to a seeing eye" and heaviness nothing but a "relation of reciprocal acceleration."[18] The parentage of modern relativism is not in Einstein but in Galileo and Newton.

What ushered in the modern age was not the age-old desire of astronomers for simplicity, harmony, and beauty, which made Copernicus look upon the orbits of the planets from the sun instead of the earth, nor the Renaissance's new-awakened love for the earth and the world, with its rebellion against the rationalism of medieval scholasticism; this love of the world, on the contrary, was the first to fall victim to the modern age's triumphal world alienation. It was rather the discovery, due to the new instrument, that Copernicus' image of "the virile man standing in the sun . . . overlooking the planets"[19] was much more than an image or a gesture, was in fact an indication of the astounding human capacity to think in terms of the universe while remaining on the earth, and the perhaps even more astounding human ability to use cosmic laws as guiding principles for terrestrial action. Compared with the earth alienation underlying the whole development of natural science in the modern age, the withdrawal from terrestrial proximity contained in the discovery of the globe as a whole and the world alienation produced in the twofold process of expropriation and wealth accumulation are of minor significance.

At any event, while world alienation determined the course and the development of modern society, earth alienation became and has remained the hallmark of modern science. Under the sign of earth alienation, every science, not only physical and natural science, so radically changed its innermost content that one may doubt whether prior to the modern age anything like science existed at all. This is perhaps clearest in the development of the new science's most important mental instrument, the devices of modern algebra, by which mathematics "succeeded in freeing itself from

18. Ernst Cassirer's early essay, *Einstein's Theory of Relativity* (Dover Publications, 1953), strongly emphasizes this continuity between twentieth-century and seventeenth-century science.

19. J. Bronowski, in an article "Science and Human Values," points out the great role the metaphor played in the mind of important scientists (see *Nation*, December 29, 1956).

the shackles of spatiality,"[20] that is, from geometry, which, as the name indicates, depends on terrestrial measures and measurements. Modern mathematics freed man from the shackles of earth-bound experience and his power of cognition from the shackles of finitude.

The decisive point here is not that men at the beginning of the modern age still believed with Plato in the mathematical structure of the universe nor that, one generation later, they believed with Descartes that certain knowledge is possible only where the mind plays with its own forms and formulas. What is decisive is the entirely un-Platonic subjection of geometry to algebraic treatment, which discloses the modern ideal of reducing terrestrial sense data and movements to mathematical symbols. Without this non-spatial symbolic language Newton would not have been able to unite astronomy and physics into a single science or, to put it another way, to formulate a law of gravitation where the same equation will cover the movements of heavenly bodies in the sky and the motion of terrestrial bodies on earth. Even then it was clear that modern mathematics, in an already breathtaking development, had discovered the amazing human faculty to grasp in symbols those dimensions and concepts which at most had been thought of as negations and hence limitations of the mind, because their immensity seemed to transcend the minds of mere mortals, whose existence lasts an insignificant time and remains bound to a not too important corner of the universe. Yet even more significant than this possibility—to reckon with entities which could not be "seen" by the eye of the mind—was the fact that the new mental instrument, in this respect even newer and more significant than all the scientific tools it helped to devise, opened the way for an altogether novel mode of meeting and approaching nature in the experiment. In the experiment man realized his newly won freedom from the shackles of earth-bound experience; instead of observing natural phenomena as they were given to him, he placed nature under the conditions of his own mind, that is, under conditions won from a universal, astrophysical viewpoint, a cosmic standpoint outside nature itself.

It is for this reason that mathematics became the leading science of the modern age, and this elevation has nothing to do with Plato,

20. Burtt, *op. cit.*, p. 44.

who deemed mathematics to be the noblest of all sciences, second only to philosophy, which he thought nobody should be permitted to approach without having become familiar first with the mathematical world of ideal forms. For mathematics (that is, geometry) was the proper introduction to that sky of ideas where no mere images (*eidōla*) and shadows, no perishable matter, could any longer interfere with the appearing of eternal being, where these appearances are saved (*sōzein ta phainomena*) and safe, as purified of human sensuality and mortality as of material perishability. Yet mathematical and ideal forms were not the products of the intellect, but given to the eyes of the mind as sense data were given to the organs of the senses; and those who were trained to perceive what was hidden from the eyes of bodily vision and the untrained mind of the many perceived true being, or rather being in its true appearance. With the rise of modernity, mathematics does not simply enlarge its content or reach out into the infinite to become applicable to the immensity of an infinite and infinitely growing, expanding universe, but ceases to be concerned with appearances at all. It is no longer the beginning of philosophy, of the "science" of Being in its true appearance, but becomes instead the science of the structure of the human mind.

When Descartes' analytical geometry treated space and extension, the *res extensa* of nature and the world, so "that its relations, however complicated, must always be expressible in algebraic formulae," mathematics succeeded in reducing and translating all that man is not into patterns which are identical with human, mental structures. When, moreover, the same analytical geometry proved "conversely that numerical truths . . . can be fully represented spatially," a physical science had been evolved which required no principles for its completion beyond those of pure mathematics, and in this science man could move, risk himself into space and be certain that he would not encounter anything but himself, nothing that could not be reduced to patterns present in him.[21] Now the phenomena could be saved only in so far as they could be reduced to a mathematical order, and this mathematical operation does not serve to prepare man's mind for the revelation of true being by directing it to the ideal measures that appear in the

21. *Ibid.*, p. 106.

sensually given data, but serves, on the contrary, to reduce these data to the measure of the human mind, which, given enough distance, being sufficiently remote and uninvolved, can look upon and handle the multitude and variety of the concrete in accordance with its own patterns and symbols. These are no longer ideal forms disclosed to the eye of the mind, but are the results of removing the eyes of the mind, no less than the eyes of the body, from the phenomena, of reducing all appearances through the force inherent in distance.

Under this condition of remoteness, every assemblage of things is transformed into a mere multitude, and every multitude, no matter how disordered, incoherent, and confused, will fall into certain patterns and configurations possessing the same validity and no more significance than the mathematical curve, which, as Leibniz once remarked, can always be found between points thrown at random on a piece of paper. For if "it can be shown that a mathematical web of some kind can be woven about any universe containing several objects . . . then the fact that our universe lends itself to mathematical treatment is not a fact of any great philosophic significance."[22] It certainly is neither a demonstration of an inherent and inherently beautiful order of nature nor does it offer a confirmation of the human mind, of its capacity to surpass the senses in perceptivity or of its adequateness as an organ for the reception of truth.

The modern *reductio scientiae ad mathematicam* has overruled the testimony of nature as witnessed at close range by human senses in the same way that Leibniz overruled the knowledge of the haphazard origin and the chaotic nature of the dot-covered piece of paper. And the feeling of suspicion, outrage, and despair, which was the first, and spiritually is still the most lasting consequence of the discovery that the Archimedean point was no vain dream of idle speculation, is not unlike the helpless outrage of a man who,

22. Bertrand Russell, as quoted by J. W. N. Sullivan, *op. cit.*, p. 144. See also Whitehead's distinction between the traditional scientific method of classification and the modern approach of measurement: the former follows objective realities whose principle is found in the otherness of nature; the latter is entirely subjective, independent of qualities, and requires not more than that a multitude of objects be given.

having watched with his own eyes how these dots were thrown arbitrarily and without foresight onto the paper, is shown and forced to admit that all his senses and all his powers of judgment have betrayed him and that what he saw was the evolution of a "geometrical line whose direction is constantly and uniformly defined by one rule."[23]

37

UNIVERSAL VERSUS NATURAL SCIENCE

It took many generations and quite a few centuries before the true meaning of the Copernican revolution and the discovery of the Archimedean point came to light. Only we, and we only for hardly more than a few decades, have come to live in a world thoroughly determined by a science and a technology whose objective truth and practical know-how are derived from cosmic and universal, as distinguished from terrestrial and "natural," laws, and in which a knowledge acquired by selecting a point of reference outside the earth is applied to earthly nature and the human artifice. There is a deep gulf between those before us who knew that the earth revolves around the sun, that neither the one nor the other is the center of the universe, and who concluded that man had lost his home as well as his privileged position in creation, and ourselves, who still and probably forever are earth-bound creatures, dependent upon metabolism with a terrestrial nature, and who have found the means to bring about processes of cosmic origin and possibly cosmic dimension. If one wishes to draw a distinctive line between the modern age and the world we have come to live in, he may well find it in the difference between a science which looks upon nature from a universal standpoint and thus acquires complete mastery over her, on one hand, and a truly "universal" science, on the other, which imports cosmic processes into nature even at the obvious risk of destroying her and, with her, man's mastership over her.

Foremost in our minds at this moment is of course the enormously increased human power of destruction, that we are able to

23. Leibniz, *Discours de métaphysique*, No. 6.

destroy all organic life on earth and shall probably be able one day to destroy even the earth itself. However, no less awesome and no less difficult to come to terms with is the corresponding new creative power, that we can produce new elements never found in nature, that we are able not only to speculate about the relationships between mass and energy and their innermost identity but actually to transform mass into energy or to transform radiation into matter. At the same time, we have begun to populate the space surrounding the earth with man-made stars, creating as it were, in the form of satellites, new heavenly bodies, and we hope that in a not very distant future we shall be able to perform what times before us regarded as the greatest, the deepest, and holiest secret of nature, to create or re-create the miracle of life. I use the word "create" deliberately, to indicate that we are actually doing what all ages before ours thought to be the exclusive prerogative of divine action.

This thought strikes us as blasphemous, and though it is blasphemous in every traditional Western or Eastern philosophic or theological frame of reference, it is no more blasphemous than what we have been doing and what we are aspiring to do. The thought loses its blasphemous character, however, as soon as we understand what Archimedes understood so well, even though he did not know how to reach his point outside the earth, namely, that no matter how we explain the evolution of the earth and nature and man, they must have come into being by some transmundane, "universal" force, whose work must be comprehensible to the point of imitation by somebody who is able to occupy the same location. It is ultimately nothing but this assumed location in the universe outside the earth that enables us to produce processes which do not occur on the earth and play no role in stable matter but are decisive for the coming into being of matter. It is indeed in the very nature of the thing that astrophysics and not geophysics, that "universal" science and not "natural" science, should have been able to penetrate the last secrets of the earth and of nature. From the viewpoint of the universe, the earth is but a special case and can be understood as such, just as in this view there cannot be a decisive distinc-

tion between matter and energy, both being "only different forms of the selfsame basic substance."[24]

With Galileo already, certainly since Newton, the word "universal" has begun to acquire a very specific meaning indeed; it means "valid beyond our solar system." And something quite similar has happened to another word of philosophic origin, the word "absolute," which is applied to "absolute time," "absolute space," "absolute motion," or "absolute speed," in each usage meaning a time, a space, a movement, a velocity which is present in the universe and compared to which earth-bound time or space or movement or speed are only "relative." Everything happening on earth has become relative since the earth's relatedness to the universe became the point of reference for all measurements.

Philosophically, it seems that man's ability to take this cosmic, universal standpoint without changing his location is the clearest possible indication of his universal origin, as it were. It is as though we no longer needed theology to tell us that man is not, cannot possibly be, of this world even though he spends his life here; and we may one day be able to look upon the age-old enthusiasm of philosophers for the universal as the first indication, as though they alone possessed a foreboding, that the time would come when men would have to live under the earth's conditions and at the same time be able to look upon and act on her from a point outside. (The trouble is only—or so it seems now—that while man can *do* things from a "universal," absolute standpoint, what the philosophers had never deemed possible, he has lost his capacity to *think* in universal, absolute terms, thus realizing and defeating at the same time the standards and ideals of traditional philosophy. Instead of the old dichotomy between earth and sky we have a new one between man and the universe, or between the capacities of the human mind for understanding and the universal laws which man can discover and handle without true comprehension.) Whatever the rewards and the burdens of this yet uncertain future may turn out to be, one thing is sure: while it may affect greatly, perhaps even radically, the vocabulary and metaphoric content of existing religions, it

24. I follow the presentation given by Werner Heisenberg, "Elementarteile der Materie," in *Vom Atom zum Weltsystem* (1954).

neither abolishes nor removes nor even shifts the unknown that is the region of faith.

While the new science, the science of the Archimedean point, needed centuries and generations to develop its full potentialities, taking roughly two hundred years before it even began to change the world and to establish new conditions for the life of man, it took no more than a few decades, hardly one generation, for the human mind to draw certain conclusions from Galileo's discoveries and the methods and assumption by which they had been accomplished. The human mind changed in a matter of years or decades as radically as the human world in a matter of centuries; and while this change naturally remained restricted to the few who belonged to that strangest of all modern societies, the society of scientists and the republic of letters (the only society which has survived all changes of conviction and conflict without a revolution and without ever forgetting to "honor the man whose beliefs it no longer shares"),[25] this society anticipated in many respects, by sheer force of trained and controlled imagination, the radical change of mind of all modern men which became a politically demonstrable reality only in our own time.[26] Descartes is no less the father of modern

25. Bronowski, *op. cit.*

26. The foundation and early history of the Royal Society is quite suggestive. When it was founded, members had to agree to take no part in matters outside the terms of reference given it by the King, especially to take no part in political or religious strife. One is tempted to conclude that the modern scientific ideal of "objectivity" was born here, which would suggest that its origin is political and not scientific. Furthermore, it seems noteworthy that the scientists found it necessary from the beginning to organize themselves into a society, and the fact that the work done inside the Royal Society turned out to be vastly more important than work done outside it demonstrated how right they were. An organization, whether of scientists who have abjured politics or of politicians, is always a political institution; where men organize they intend to act and to acquire power. No scientific teamwork is pure science, whether its aim is to act upon society and secure its members a certain position within it or—as was and still is to a large extent the case of organized research in the natural sciences—to act together and in concert in order to conquer nature. It is indeed, as Whitehead once remarked, "no accident that an age of science has developed into an age of organisation. Organised thought is the basis of organised action," not, one is tempted to add, because thought is the basis of action but rather because modern science as "the organisation of thought" introduced an element of action into thinking. (See *The Aims of Education* [Mentor ed.], pp. 106–7.)

philosophy than Galileo is the ancestor of modern science, and while it is true that after the seventeenth century, and chiefly because of the development of modern philosophy, science and philosophy parted company more radically than ever before[27]—Newton was almost the last to consider his own endeavors as "experimental philosophy" and to offer his discoveries to the reflection of "astronomers and philosophers,"[28] as Kant was the last philosopher who was also a kind of astronomer and natural scientist[29]—modern philosophy owes its origin and its course more exclusively to specific scientific discoveries than any previous philosophy. That this philosophy, the exact counterpart of a scientific world view long since discarded, has not become obsolete today is not only due to the nature of philosophy, which, wherever it is authentic, possesses the same permanence and durability as art works, but is in this particular case closely related to the eventual evolution of a world where truths for many centuries accessible only to the few have become realities for everybody.

It would be folly indeed to overlook the almost too precise congruity of modern man's world alienation with the subjectivism of modern philosophy, from Descartes and Hobbes to English sensualism, empiricism, and pragmatism, as well as German idealism and materialism up to the recent phenomenological existentialism and logical or epistemological positivism. But it would be equally foolish to believe that what turned the philosopher's mind away from the old metaphysical questions toward a great variety of introspections—introspection into his sensual or cognitive apparatus, into his consciousness, into psychological and logical processes—was an impetus that grew out of an autonomous development of ideas, or, in a variation of the same approach, to believe that our world would have become different if only philosophy had held

27. Karl Jaspers, in his masterful interpretation of Cartesian philosophy, insists on the strange ineptitude of Descartes' "scientific" ideas, his lack of understanding for the spirit of modern science, and his inclination to accept theories uncritically without tangible evidence, which had already surprised Spinoza (*op. cit.*, esp. pp. 50 ff. and 93 ff.).

28. See Newton's *Mathematical Principles of Natural Philosophy*, trans. Motte (1803), II, 314.

29. Among Kant's early publications was an *Allgemeine Naturgeschichte und Theorie des Himmels.*

fast to tradition. As we said before, not ideas but events change the world—the heliocentric system as an idea is as old as Pythagorean speculation and as persistent in our history as Neo-Platonic traditions, without, for that matter, ever having changed the world or the human mind—and the author of the decisive event of the modern age is Galileo rather than Descartes. Descartes himself was quite aware of this, and when he heard of Galileo's trial and his recantation, he was tempted for a moment to burn all his papers, because "if the movement of the earth is false, all the foundations of my philosophy are also false."[30] But Descartes and the philosophers, since they elevated what had happened to the level of uncompromising thought, registered with unequaled precision the enormous shock of the event; they anticipated, at least partially, the very perplexities inherent in the new standpoint of man with which the scientists were too busy to bother until, in our own time, they began to appear in their own work and to interfere with their own inquiries. Since then, the curious discrepancy between the mood of modern philosophy, which from the beginning had been predominantly pessimistic, and the mood of modern science, which until very recently had been so buoyantly optimistic, has been bridged. There seems to be little cheerfulness left in either of them.

38

THE RISE OF THE CARTESIAN DOUBT

Modern philosophy began with Descartes' *de omnibus dubitandum est*, with doubt, but with doubt not as an inherent control of the human mind to guard against deceptions of thought and illusions of sense, not as skepticism against the morals and prejudices of men and times, not even as a critical method in scientific inquiry and philosophic speculation. Cartesian doubt is much more far-reaching in scope and too fundamental in intent to be determined by such concrete contents. In modern philosophy and thought, doubt occupies much the same central position as that occupied for all the centuries before by the Greek *thaumazein*, the wonder at everything that is as it is. Descartes was the first to conceptualize this modern doubting, which after him became the self-evident, in-

30. See Descartes' letter to Mersenne of November, 1633.

audible motor which has moved all thought, the invisible axis around which all thinking has been centered. Just as from Plato and Aristotle to the modern age conceptual philosophy, in its greatest and most authentic representatives, had been the articulation of wonder, so modern philosophy since Descartes has consisted in the articulations and ramifications of doubting.

Cartesian doubt, in its radical and universal significance, was originally the response to a new reality, a reality no less real for its being restricted for centuries to the small and politically insignificant circle of scholars and learned men. The philosophers understood at once that Galileo's discoveries implied no mere challenge to the testimony of the senses and that it was no longer reason, as in Aristarchus and Copernicus, that had "committed such a rape on their senses," in which case men indeed would have needed only to choose between their faculties and to let innate reason become "the mistress of their credulity."[31] It was not reason but a man-made instrument, the telescope, which actually changed the physical world view; it was not contemplation, observation, and speculation which led to the new knowledge, but the active stepping in of *homo faber*, of making and fabricating. In other words, man had been deceived so long as he trusted that reality and truth would reveal themselves to his senses and to his reason if only he remained true to what he saw with the eyes of body and mind. The old opposition of sensual and rational truth, of the inferior truth capacity of the senses and the superior truth capacity of reason, paled beside this challenge, beside the obvious implication that neither truth nor reality is given, that neither of them appears as it is, and that only interference with appearance, doing away with appearances, can hold out a hope for true knowledge.

The extent to which reason and faith in reason depend not upon single sense perceptions, each of which may be an illusion, but upon the unquestioned assumption that the senses as a whole—kept together and ruled over by common sense, the sixth and the highest sense—fit man into the reality which surrounds him, was only now

31. In these words, Galileo expresses his admiration for Copernicus and Aristarchus, whose reason "was able . . . to commit such a rape on their senses, as in despite thereof to make herself mistress of their credulity" (*Dialogues concerning the Two Great Systems of the World*, trans. Salusbury [1661], p. 301).

discovered. If the human eye can betray man to the extent that so many generations of men were deceived into believing that the sun turns around the earth, then the metaphor of the eyes of the mind cannot possibly hold any longer; it was based, albeit implicitly and even when it was used in opposition to the senses, on an ultimate trust in bodily vision. If Being and Appearance part company forever, and this—as Marx once remarked—is indeed the basic assumption of all modern science, then there is nothing left to be taken upon faith; everything must be doubted. It was as though Democritus' early prediction that a victory of the mind over the senses could end only in the mind's defeat had come true, except that now the reading of an instrument seemed to have won a victory over both the mind and the senses.[31a]

The outstanding characteristic of Cartesian doubt is its universality, that nothing, no thought and no experience, can escape it. No one perhaps explored its true dimensions more honestly than Kierkegaard when he leaped—not from reason, as he thought, but from doubt—into belief, thereby carrying doubt into the very heart of modern religion.[32] Its universality spreads from the testimony of the senses to the testimony of reason to the testimony of faith because this doubt resides ultimately in the loss of self-evidence, and all thought had always started from what is evident in and by itself—evident not only for the thinker but for everybody. Cartesian doubt did not simply doubt that human understanding may not be open to every truth or that human vision may not be able to see everything, but that intelligibility to human understanding does not at all constitute a demonstration of truth, just as visibility did not at all constitute proof of reality. This doubt doubts

31a. Democritus, after having stated that "in reality there is no white, or black, or bitter, or sweet," added: "Poor mind, from the senses you take your arguments, and then want to defeat them? Your victory is your defeat" (Diels, *Fragmente der Vorsokratiker* [4th ed., 1922], frag. B125).

32. See *Johannes Climacus oder De omnibus dubitandum est*, one of the earliest manuscripts of Kierkegaard and perhaps still the deepest interpretation of Cartesian doubt. It tells in the form of a spiritual autobiography how he learned about Descartes from Hegel and then regretted not having started his philosophical studies with his works. This little treatise, the Danish edition of the *Collected Works* (Copenhagen, 1909), Vol. IV, is available in a German translation (Darmstadt, 1948).

that such a thing as truth exists at all, and discovers thereby that the traditional concept of truth, whether based on sense perception or on reason or on belief in divine revelation, had rested on the twofold assumption that what truly is will appear of its own accord and that human capabilities are adequate to receive it.[33] That truth reveals itself was the common creed of pagan and Hebrew antiquity, of Christian and secular philosophy. This is the reason why the new, modern philosophy turned with such vehemence—in fact with a violence bordering on hatred—against tradition, making short shrift of the enthusiastic Renaissance revival and rediscovery of antiquity.

The poignancy of Descartes' doubt is fully realized only if one understands that the new discoveries dealt an even more disastrous blow to human confidence in the world and in the universe than is indicated by a clear-cut separation of being and appearance. For here the relationship between these two is no longer static as it was in traditional skepticism, as though appearances simply hide and cover a true being which forever escapes the notice of man. This Being, on the contrary, is tremendously active and energetic: it creates its own appearances, except that these appearances are delusions. Whatever human senses perceive is brought about by invisible, secret forces, and if through certain devices, ingenious instruments, these forces are caught in the act rather than discovered —as an animal is trapped or a thief is caught much against their own will and intentions—it turns out that this tremendously effec-

33. The close relatedness of confidence in the senses and confidence in reason in the traditional concept of truth was clearly recognized by Pascal. According to him: "Ces deux principes de vérité, la raison et les sens, outre qu'ils manquent chacun de sincérité, s'abusent réciproquement l'un et l'autre. Les sens abusent la raison par de fausses apparences; et cette même piperie qu'ils apportent à la raison, ils la reçoivent d'elle à leur tour: elle s'en revanche. Les passions de l'âme troublent les sens, et leur font des impressions fausses. Ils mentent et se trompent à l'envi" (*Pensées* [Pléiades ed., 1950], No. 92, p. 849). Pascal's famous wager that he certainly would risk less by believing what Christianity has to teach about a hereafter than by disbelieving it is sufficient demonstration of the interrelatedness of rational and sensory truth with the truth of divine revelation. To Pascal, as to Descartes, God is *un Dieu caché* (*ibid.*, No. 366, p. 923) who does not reveal himself, but whose existence and even goodness is the only hypothetical guaranty that human life is not a dream (the Cartesian nightmare recurs in Pascal, *ibid.*, No. 380, p. 928) and human knowledge not a divine fraud.

tive Being is of such a nature that its disclosures must be illusions and that conclusions drawn from its appearances must be delusions.

Descartes' philosophy is haunted by two nightmares which in a sense became the nightmares of the whole modern age, not because this age was so deeply influenced by Cartesian philosophy, but because their emergence was almost inescapable once the true implications of the modern world view were understood. These nightmares are very simple and very well known. In the one, reality, the reality of the world as well as of human life, is doubted; if neither the senses nor common sense nor reason can be trusted, then it may well be that all that we take for reality is only a dream. The other concerns the general human condition as it was revealed by the new discoveries and the impossibility for man to trust his senses and his reason; under these circumstances it seems, indeed, much more likely that an evil spirit, a *Dieu trompeur*, wilfully and spitefully betrays man than that God is the ruler of the universe. The consummate devilry of this evil spirit would consist in having created a creature which harbors a notion of truth only to bestow on it such other faculties that it will never be able to reach any truth, never be able to be certain of anything.

Indeed, this last point, the question of certainty, was to become decisive for the whole development of modern morality. What was lost in the modern age, of course, was not the capacity for truth or reality or faith nor the concomitant inevitable acceptance of the testimony of the senses and of reason, but the certainty that formerly went with it. In religion it was not belief in salvation or a hereafter that was immediately lost, but the *certitudo salutis*—and this happened in all Protestant countries where the downfall of the Catholic Church had eliminated the last tradition-bound institution which, wherever its authority remained unchallenged, stood between the impact of modernity and the masses of believers. Just as the immediate consequence of this loss of certainty was a new zeal for making good in this life as though it were only an overlong period of probation,[34] so the loss of certainty of truth ended in a

34. Max Weber, who, despite some errors in detail which by now have been corrected, is still the only historian who raised the question of the modern age with the depth and relevance corresponding to its importance, was also aware that it was not a simple loss of faith that caused the reversal in the estimate of

new, entirely unprecedented zeal for truthfulness—as though man could afford to be a liar only so long as he was certain of the unchallengeable existence of truth and objective reality, which surely would survive and defeat all his lies.[35] The radical change in moral standards occurring in the first century of the modern age was inspired by the needs and ideals of its most important group of men, the new scientists; and the modern cardinal virtues—success, industry, and truthfulness—are at the same time the greatest virtues of modern science.[36]

The learned societies and Royal Academies became the morally influential centers where scientists were organized to find ways and means by which nature could be trapped by experiments and instruments so that she would be forced to yield her secrets. And this gigantic task, to which no single man but only the collective effort of the best minds of mankind could possibly be adequate, prescribed the rules of behavior and the new standards of judgment. Where formerly truth had resided in the kind of "theory" that since the Greeks had meant the contemplative glance of the beholder who was concerned with, and received, the reality opening up before him, the question of success took over and the test of theory became a "practical" one—whether or not it will work. Theory became hypothesis, and the success of the hypothesis became truth. This all-important standard of success, however, does not depend upon practical considerations or the technical developments which may or may not accompany specific scientific discoveries. The criterion of success is inherent in the very essence and progress of modern science quite apart from its applicability. Success here is not at all the empty idol to which it degenerated in

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work and labor, but the loss of the *certitudo salutis*, of the certainty of salvation. In our context, it would appear that this certainty was only one among the many certainties lost with the arrival of the modern age.

35. It certainly is quite striking that not one of the major religions, with the exception of Zoroastrianism, has ever included lying as such among the mortal sins. Not only is there no commandment: Thou shalt not lie (for the commandment: Thou shalt not bear false witness against thy neighbor, is of course of a different nature), but it seems as though prior to puritan morality nobody ever considered lies to be serious offenses.

36. This is the chief point of Bronowski's article quoted above.

bourgeois society; it was, and in the sciences has been ever since, a veritable triumph of human ingenuity against overwhelming odds.

The Cartesian solution of universal doubt or its salvation from the two interconnected nightmares—that everything is a dream and there is no reality and that not God but an evil spirit rules the world and mocks man—was similar in method and content to the turning away from truth to truthfulness and from reality to reliability. Descartes' conviction that "though our mind is not the measure of things or of truth, it must assuredly be the measure of things that we affirm or deny"[37] echoes what scientists in general and without explicit articulation had discovered: that even if there is no truth, man can be truthful, and even if there is no reliable certainty, man can be reliable. If there was salvation, it had to lie in man himself, and if there was a solution to the questions raised by doubting, it had to come from doubting. If everything has become doubtful, then doubting at least is certain and real. Whatever may be the state of reality and of truth as they are given to the senses and to reason, "nobody can doubt of his doubt and remain uncertain whether he doubts or does not doubt."[38] The famous *cogito ergo sum* ("I think, hence I am") did not spring for Descartes from any self-certainty of thought as such—in which case, indeed, thought would have acquired a new dignity and significance for man—but was a mere generalization of a *dubito ergo sum.*[39] In

37. From a letter of Descartes to Henry More, quoted from Koyré, *op. cit.*, p. 117.

38. In the dialogue *La recherche de la vérité par la lumière naturelle*, where Descartes exposes his fundamental insights without technical formality, the central position of doubting is even more in evidence than in his other works. Thus Eudoxe, who stands for Descartes, explains: "Vous pouvez douter avec raison de toutes les choses dont la connaissance ne vous vient que par l'office des sens; mais pouvez-vous douter de votre doute et rester incertain si vous doutez ou non? . . . vous qui doutez vous êtes, et cela est si vrai que vous n'en pouvez douter davantage" (Pléiade ed., p. 680).

39. "Je doute, donc je suis, ou bien ce qui est la même chose: je pense, donc je suis" (*ibid.*, p. 687). Thought in Descartes has indeed a mere derivative character: "Car s'il est vrai que je doute, comme je n'en puis douter, il est également vrai que je pense; en effet douter est-il autre chose que penser d'une certaine manière?" (*ibid.*, p. 686). The leading idea of this philosophy is by no means that I would not be able to think without being, but that "nous ne saurions douter sans être, et que cela est la première connaissance certaine qu'on peut acquérir" (*Prin-*

other words, from the mere logical certainty that in doubting something I remain aware of a process of doubting in my consciousness, Descartes concluded that those processes which go on in the mind of man himself have a certainty of their own, that they can become the object of investigation in introspection.

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INTROSPECTION AND THE LOSS OF COMMON SENSE

Introspection, as a matter of fact, not the reflection of man's mind on the state of his soul or body but the sheer cognitive concern of consciousness with its own content (and this is the essence of the Cartesian *cogitatio*, where *cogito* always means *cogito me cogitare*) must yield certainty, because here nothing is involved except what the mind has produced itself; nobody is interfering but the producer of the product, man is confronted with nothing and nobody but himself. Long before the natural and physical sciences began to wonder if man is capable of encountering, knowing, and comprehending anything except himself, modern philosophy had made sure in introspection that man concerns himself only with himself. Descartes believed that the certainty yielded by his new method of introspection is the certainty of the I-am.[40] Man, in other words, carries his certainty, the certainty of his existence, within himself; the sheer functioning of consciousness, though it cannot possibly assure a worldly reality given to the senses and to reason, confirms beyond doubt the reality of sensations and of reasoning, that is, the reality of processes which go on in the mind. These are not unlike

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cipes [Pléiade ed.], Part I, sec. 7). The argument itself is of course not new. One finds it, for instance, almost word for word in Augustine's *De libero arbitrio* (ch. 3), but without the implication that this is the only certainty against the possibility of a *Dieu trompeur* and, generally, without being the very fundament of a philosophical system.

40. That the *cogito ergo sum* contains a logical error, that, as Nietzsche pointed out, it should read: *cogito, ergo cogitationes sunt*, and that therefore the mental awareness expressed in the *cogito* does not prove that I am, but only that consciousness is, is another matter and need not interest us here (see Nietzsche, *Wille zur Macht*, No. 484).

the biological processes that go on in the body and which, when one becomes aware of them, can also convince one of its working reality. In so far as even dreams are real, since they presuppose a dreamer and a dream, the world of consciousness is real enough. The trouble is only that just as it would be impossible to infer from the awareness of bodily processes the actual shape of any body, including one's own, so it is impossible to reach out from the mere consciousness of sensations, in which one senses his senses and in which even the sensed object becomes part of sensation, into reality with its shapes, forms, colors, and constellations. The seen tree may be real enough for the sensation of vision, just as the dreamed tree is real enough for the dreamer as long as the dream lasts, but neither can ever become a real tree.

It is out of these perplexities that Descartes and Leibniz needed to prove, not the existence of God, but his goodness, the one demonstrating that no evil spirit rules the world and mocks man and the other that this world, including man, is the best of all possible worlds. The point about these exclusively modern justifications, known since Leibniz as theodicies, is that the doubt does not concern the existence of a highest being, which, on the contrary, is taken for granted, but concerns his revelation, as given in biblical tradition, and his intentions with respect to man and world, or rather the adequateness of the relationship between man and world. Of these two, the doubt that the Bible or nature contains divine revelation is a matter of course, once it has been shown that revelation as such, the disclosure of reality to the senses and of truth to reason, is no guaranty for either. Doubt of the goodness of God, however, the notion of a *Dieu trompeur*, arose out of the very experience of deception inherent in the acceptance of the new world view, a deception whose poignancy lies in its irremediable repetitiveness, for no knowledge about the heliocentric nature of our planetary system can change the fact that every day the sun is seen circling the earth, rising and setting at its preordained location. Only now, when it appeared as though man, if it had not been for the accident of the telescope, might have been deceived forever, did the ways of God really become wholly inscrutable; the more man learned about the universe, the less he could understand the intentions and purposes for which he should have been created.

The goodness of the God of the theodicies, therefore, is strictly the quality of a *deus ex machina;* inexplicable goodness is ultimately the only thing that saves reality in Descartes' philosophy (the co-existence of mind and extension, *res cogitans* and *res extensa*), as it saves the prestabilized harmony between man and world in Leibniz.[41]

The very ingenuity of Cartesian introspection, and hence the reason why this philosophy became so all-important to the spiritual and intellectual development of the modern age, lies first in that it had used the nightmare of non-reality as a means of submerging all worldly objects into the stream of consciousness and its processes. The "seen tree" found in consciousness through introspection is no longer the tree given in sight and touch, an entity in itself with an unalterable identical shape of its own. By being processed into an object of consciousness on the same level with a merely remembered or entirely imaginary thing, it becomes part and parcel of this process itself, of that consciousness, that is, which one knows only as an ever-moving stream. Nothing perhaps could prepare our minds better for the eventual dissolution of matter into energy, of objects into a whirl of atomic occurrences, than this dissolution of objective reality into subjective states of mind or, rather, into subjective mental processes. Second, and this was of even greater relevance to the initial stages of the modern age, the Cartesian method of securing certainty against universal doubt corresponded most precisely to the most obvious conclusion to be drawn from the new physical science: though one cannot know truth as something given and disclosed, man can at least know what he makes himself. This, indeed, became the most general and most generally accepted attitude of the modern age, and it is this conviction, rather

41. This quality of God as a *deus ex machina*, as the only possible solution to universal doubt, is especially manifest in Descartes' *Méditations.* Thus, he says in the third meditation: In order to eliminate the cause of doubting, "je dois examiner s'il y a un Dieu . . . ; et si je trouve qu'il y en ait un, je dois aussi examiner s'il peut être trompeur: car sans la connaissance de ces deux vérités, je ne vois pas que je puisse jamais être certain d'aucune chose." And he concludes at the end of the fifth meditation: "Ainsi je reconnais très clairement que la certitude et la vérité de toute science dépend de la seule connaissance du vrai Dieu: en sorte qu'avant que je le connusse, je ne pouvais savoir parfaitement aucune autre chose" (Pléiade ed., pp. 177, 208).

than the doubt underlying it, that propelled one generation after another for more than three hundred years into an ever-quickening pace of discovery and development.

Cartesian reason is entirely based "on the implicit assumption that the mind can only know that which it has itself produced and retains in some sense within itself."[42] Its highest ideal must therefore be mathematical knowledge as the modern age understands it, that is, not the knowledge of ideal forms given outside the mind but of forms produced by a mind which in this particular instance does not even need the stimulation—or, rather, the irritation—of the senses by objects other than itself. This theory is certainly what Whitehead calls it, "the outcome of common-sense in retreat."[43] For common sense, which once had been the one by which all other senses, with their intimately private sensations, were fitted into the common world, just as vision fitted man into the visible world, now became an inner faculty without any world relationship. This sense now was called common merely because it happened to be common to all. What men now have in common is not the world but the structure of their minds, and this they cannot have in common, strictly speaking; their faculty of reasoning can only happen to be the same in everybody.[44] The fact that, given the problem of two plus two we all will come out with the same answer, four, is henceforth the very model of common-sense reasoning.

Reason, in Descartes no less than in Hobbes, becomes "reckoning with consequences," the faculty of deducing and concluding, that is, of a process which man at any moment can let loose within himself. The mind of this man—to remain in the sphere of mathematics—no longer looks upon "two-and-two-are-four" as an equation in which two sides balance in a self-evident harmony, but understands the equation as the expression of a process in which two and two *become* four in order to generate further processes of addi-

42. A. N. Whitehead, *The Concept of Nature* (Ann Arbor ed.), p. 32.

43. *Ibid.*, p. 43. The first to comment on and criticize the absence of common sense in Descartes was Vico (see *De nostri temporis studiorum ratione*, ch. 3).

44. This transformation of common sense into an inner sense is characteristic of the whole modern age; in the German language it is indicated by the difference between the older German word *Gemeinsinn* and the more recent expression *gesunder Menschenverstand* which replaced it.

tion which eventually will lead into the infinite. This faculty the modern age calls common-sense reasoning; it is the playing of the mind with itself, which comes to pass when the mind is shut off from all reality and "senses" only itself. The results of this play are compelling "truths" because the structure of one man's mind is supposed to differ no more from that of another than the shape of his body. Whatever difference there may be is a difference of mental power, which can be tested and measured like horsepower. Here the old definition of man as an *animal rationale* acquires a terrible precision: deprived of the sense through which man's five animal senses are fitted into a world common to all men, human beings are indeed no more than animals who are able to reason, "to reckon with consequences."

The perplexity inherent in the discovery of the Archimedean point was and still is that the point outside the earth was found by an earth-bound creature, who found that he himself lived not only in a different but in a topsy-turvy world the moment he tried to apply his universal world view to his actual surroundings. The Cartesian solution of this perplexity was to move the Archimedean point into man himself,[45] to choose as ultimate point of reference the pattern of the human mind itself, which assures itself of reality and certainty within a framework of mathematical formulas which are its own products. Here the famous *reductio scientiae ad mathematicam* permits replacement of what is sensuously given by a system of mathematical equations where all real relationships are dissolved into logical relations between man-made symbols. It is this replacement which permits modern science to fulfil its "task of *producing*" the phenomena and objects it wishes to observe.[46] And the assumption is that neither God nor an evil spirit can change the fact that two and two equal four.

45. This removal of the Archimedean point into man himself was a conscious operation of Descartes: "Car à partir de ce doute universel, comme à partir d'un point fixe et immobile, je me suis proposé de faire dériver la connaissance de Dieu, de vous-mêmes et de toutes les choses qui existent dans le monde" (*Recherche de la vérité*, p. 680).

46. Frank, *op. cit.*, defines science by its "task of producing desired observable phenomena."

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THOUGHT AND THE MODERN WORLD VIEW

The Cartesian removal of the Archimedean point into the mind of man, while it enabled man to carry it, as it were, within himself wherever he went and thus freed him from given reality altogether —that is, from the human condition of being an inhabitant of the earth—has perhaps never been as convincing as the universal doubt from which it sprang and which it was supposed to dispel.[47] Today, at any rate, we find in the perplexities confronting natural scientists in the midst of their greatest triumphs the same nightmares which have haunted the philosophers from the beginning of the modern age. This nightmare is present in the fact that a mathematical equation, such as of mass and energy—which originally was destined only to save the phenomena, to be in agreement with observable facts that could also be explained differently, just as the Ptolemaic and Copernican systems originally differed only in simplicity and harmony—actually lends itself to a very real conversion of mass into energy and vice versa, so that the mathematical "conversion" implicit in every equation corresponds to convertibility in reality; it is present in the weird phenomenon that the systems of non-Euclidean mathematics were found without any forethought of applicability or even empirical meaning before they gained their surprising validity in Einstein's theory; and it is even more troubling in the inevitable conclusion that "the possibility of such an application must be held open for all, even the most remote constructions of pure mathematics."[48] If it should be true that a whole universe, or rather any number of utterly different universes will spring into existence and "prove" whatever over-all pattern the

47. Ernst Cassirer's hope that "doubt is overcome by being outdone" and that the theory of relativity would free the human mind from its last "earthly remainder," namely, the anthropomorphism inherent in "the manner in which we make empirical measurements of space and time" (*op. cit.*, pp. 389, 382), has not been fulfilled; on the contrary, doubt not of the validity of scientific statements but of the intelligibility of scientific data has increased during the last decades.

48. *Ibid.*, p. 443.

human mind has constructed, then man may indeed, for a moment, rejoice in a reassertion of the "pre-established harmony between pure mathematics and physics,"[49] between mind and matter, between man and the universe. But it will be difficult to ward off the suspicion that this mathematically preconceived world may be a dream world where every dreamed vision man himself produces has the character of reality only as long as the dream lasts. And his suspicions will be enforced when he must discover that the events and occurrences in the infinitely small, the atom, follow the same laws and regularities as in the infinitely large, the planetary systems.[50] What this seems to indicate is that if we inquire into nature from the standpoint of astronomy we receive planetary systems, while if we carry out our astronomical inquiries from the standpoint of the earth we receive geocentric, terrestrial systems.

In any event, wherever we try to transcend appearance beyond all sensual experience, even instrument-aided, in order to catch the ultimate secrets of Being, which according to our physical world view is so secretive that it never appears and still so tremendously powerful that it produces all appearance, we find that the same patterns rule the macrocosm and the microcosm alike, that we receive the same instrument readings. Here again, we may for a moment rejoice in a refound unity of the universe, only to fall prey to the suspicion that what we have found may have nothing to do with either the macrocosmos or the microcosmos, that we deal only with the patterns of our own mind, the mind which designed the instruments and put nature under its conditions in the experiment—prescribed its laws to nature, in Kant's phrase—in which case it is really as though we were in the hands of an evil spirit who

49. Hermann Minkowski, "Raum und Zeit," in Lorentz, Einstein, and Minkowski, *Das Relativitätsprinzip* (1913); quoted from Cassirer, *op. cit.*, p. 419.

50. And this doubt is not assuaged if another coincidence is added, the coincidence between logic and reality. Logically, it seems evident indeed that "the electrons if they were to explain the sensory qualities of matter could not very well possess these sensory qualities, since in that case the question for the cause of these qualities would simply have been removed one step farther, but not solved" (Heisenberg, *Wandlungen in den Grundlagen der Naturwissenschaft*, p. 66). The reason why we become suspicious is that only when "in the course of time" the scientists became aware of this logical necessity did they discover that "matter" had no qualities and therefore could no longer be called matter.

mocks us and frustrates our thirst for knowledge, so that wherever we search for that which we are not, we encounter only the patterns of our own minds.

Cartesian doubt, logically the most plausible and chronologically the most immediate consequence of Galileo's discovery, was assuaged for centuries through the ingenious removal of the Archimedean point into man himself, at least so far as natural science was concerned. But the mathematization of physics, by which the absolute renunciation of the senses for the purpose of knowing was carried through, had in its last stages the unexpected and yet plausible consequence that every question man puts to nature is answered in terms of mathematical patterns to which no model can ever be adequate, since one would have to be shaped after our sense experiences.[51] At this point, the connection between thought and sense experience, inherent in the human condition, seems to take its revenge: while technology demonstrates the "truth" of modern science's most abstract concepts, it demonstrates no more than that man can always apply the results of his mind, that no matter which system he uses for the explanation of natural phenomena he will always be able to adopt it as a guiding principle for making and acting. This possibility was latent even in the beginnings of modern mathematics, when it turned out that numerical truths can be fully translated into spatial relationships. If, therefore, present-day science in its perplexity points to technical achievements to "prove" that we deal with an "authentic order" given in nature,[52] it seems it has fallen into a vicious circle, which can be formulated as follows: scientists formulate their hypotheses to arrange their experiments and then use these experiments to verify their hypotheses; during this whole enterprise, they obviously deal with a hypothetical nature.[53]

51. In the words of Erwin Schrödinger: "As our mental eye penetrates into smaller and smaller distances and shorter and shorter times, we find nature behaving so entirely differently from what we observe in visible and palpable bodies of our surrounding that *no* model shaped after our large-scale experiences can ever be 'true' " (*Science and Humanism* [1952], p. 25).

52. Heisenberg, *Wandlungen in den Grundlagen*, p. 64.

53. This point is best illustrated by a statement of Planck, quoted in a very illuminating article by Simone Weil (published under the pseudonym "Emil Novis" and entitled "Réflexions à propos de la théorie des quanta," in *Cahiers du*

In other words, the world of the experiment seems always capable of becoming a man-made reality, and this, while it may increase man's power of making and acting, even of creating a world, far beyond what any previous age dared to imagine in dream and phantasy, unfortunately puts man back once more—and now even more forcefully—into the prison of his own mind, into the limitations of patterns he himself created. The moment he wants what all ages before him were capable of achieving, that is, to experience the reality of what he himself is not, he will find that nature and the universe "escape him" and that a universe construed according to the behavior of nature in the experiment and in accordance with the very principles which man can translate technically into a working reality lacks all possible representation. What is new here is not that things exist of which we cannot form an image—such "things" were always known and among them, for instance, belonged the "soul"—but that the material things we see and represent and against which we had measured immaterial things for which we can form no images should likewise be "unimaginable." With the disappearance of the sensually given world, the transcendent world disappears as well, and with it the possibility of transcending the material world in concept and thought. It is therefore not surprising that the new universe is not only "practically inaccessible but not even thinkable," for "however we think it, it is wrong; not perhaps quite as meaningless as a 'triangular circle,' but much more so than a 'winged lion.' "[54]

Cartesian universal doubt has now reached the heart of physical

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Sud [December, 1942]), which in the French translation runs as follows: "Le créateur d'une hypothèse dispose de possibilités pratiquement illimitées, il est aussi peu lié par le fonctionnement des organes de ses sens qu'il ne l'est par celui des instruments dont il se sert. . . . On peut même dire qu'il se crée une géométrie à sa fantasie. . . . C'est pourquoi aussi jamais des mesures ne pourront confirmer ni infirmer directement une hypothèse; elles pourront seulement en faire ressortir la convenance plus ou moins grande." Simone Weil points out at length how something "infiniment plus précieux" than science is compromised in this crisis, namely, the notion of truth; she fails, however, to see that the greatest perplexity in this state of affairs arises from the undeniable fact that these hypotheses "work." (I owe the reference to this little known article to Miss Beverly Woodward, a former student of mine.)

54. Schrödinger, *op. cit.*, p. 26.

science itself; for the escape into the mind of man himself is closed if it turns out that the modern physical universe is not only beyond presentation, which is a matter of course under the assumption that nature and Being do not reveal themselves to the senses, but is inconceivable, unthinkable in terms of pure reasoning as well.

41

THE REVERSAL OF CONTEMPLATION AND ACTION

Perhaps the most momentous of the spiritual consequences of the discoveries of the modern age and, at the same time, the only one that could not have been avoided, since it followed closely upon the discovery of the Archimedean point and the concomitant rise of Cartesian doubt, has been the reversal of the hierarchical order between the *vita contemplativa* and the *vita activa.*

In order to understand how compelling the motives for this reversal were, it is first of all necessary to rid ourselves of the current prejudice which ascribes the development of modern science, because of its applicability, to a pragmatic desire to improve conditions and better human life on earth. It is a matter of historical record that modern technology has its origins not in the evolution of those tools man had always devised for the twofold purpose of easing his labors and erecting the human artifice, but exclusively in an altogether non-practical search for useless knowledge. Thus, the watch, one of the first modern instruments, was not invented for purposes of practical life, but exclusively for the highly "theoretical" purpose of conducting certain experiments with nature. This invention, to be sure, once its practical usefulness became apparent, changed the whole rhythm and the very physiognomy of human life; but from the standpoint of the inventors, this was a mere incident. If we had to rely only on men's so-called practical instincts, there would never have been any technology to speak of, and although today the already existing technical inventions carry a certain momentum which will probably generate improvements up to a certain point, it is not likely that our technically conditioned world could survive, let alone develop further, if we ever succeeded in convincing ourselves that man is primarily a practical being.

However that may be, the fundamental experience behind the reversal of contemplation and action was precisely that man's thirst for knowledge could be assuaged only after he had put his trust into the ingenuity of his hands. The point was not that truth and knowledge were no longer important, but that they could be won only by "action" and not by contemplation. It was an instrument, the telescope, a work of man's hands, which finally forced nature, or rather the universe, to yield its secrets. The reasons for trusting *doing* and for distrusting *contemplation* or *observation* became even more cogent after the results of the first active inquiries. After being and appearance had parted company and truth was no longer supposed to appear, to reveal and disclose itself to the mental eye of a beholder, there arose a veritable necessity to hunt for truth behind deceptive appearances. Nothing indeed could be less trustworthy for acquiring knowledge and approaching truth than passive observation or mere contemplation. In order to be certain one had to *make sure*, and in order to know one had to do. Certainty of knowledge could be reached only under a twofold condition: first, that knowledge concerned only what one had done himself—so that its ideal became mathematical knowledge, where we deal only with self-made entities of the mind—and second, that knowledge was of such a nature that it could be tested only through more doing.

Since then, scientific and philosophic truth have parted company; scientific truth not only need not be eternal, it need not even be comprehensible or adequate to human reason. It took many generations of scientists before the human mind grew bold enough to fully face this implication of modernity. If nature and the universe are products of a divine maker, and if the human mind is incapable of understanding what man has not made himself, then man cannot possibly expect to learn anything about nature that he can understand. He may be able, through ingenuity, to find out and even to imitate the devices of natural processes, but that does not mean these devices will ever make sense to him—they do not have to be intelligible. As a matter of fact, no supposedly suprarational divine revelation and no supposedly abstruse philosophic truth has ever offended human reason so glaringly as certain results of modern science. One can indeed say with Whitehead: "Heaven knows

what seeming nonsense may not to-morrow be demonstrated truth."[55]

Actually, the change that took place in the seventeenth century was more radical than what a simple reversal of the established traditional order between contemplation and doing is apt to indicate. The reversal, strictly speaking, concerned only the relationship between thinking and doing, whereas contemplation, in the original sense of beholding the truth, was altogether eliminated. For thought and contemplation are not the same. Traditionally, thought was conceived as the most direct and important way to lead to the contemplation of truth. Since Plato, and probably since Socrates, thinking was understood as the inner dialogue in which one speaks with himself (*eme emautō*, to recall the idiom current in Plato's dialogues); and although this dialogue lacks all outward manifestation and even requires a more or less complete cessation of all other activities, it constitutes in itself a highly active state. Its outward inactivity is clearly separated from the passivity, the complete stillness, in which truth is finally revealed to man. If medieval scholasticism looked upon philosophy as the handmaiden of theology, it could very well have appealed to Plato and Aristotle themselves; both, albeit in a very different context, considered this dialogical thought process to be the way to prepare the soul and lead the mind to a beholding of truth beyond thought and beyond speech—a truth that is *arrhēton*, incapable of being communicated through words, as Plato put it,[56] or beyond speech, as in Aristotle.[57]

The reversal of the modern age consisted then not in raising doing to the rank of contemplating as the highest state of which human beings are capable, as though henceforth doing was the ultimate meaning for the sake of which contemplation was to be performed, just as, up to that time, all activities of the *vita activa* had been judged and justified to the extent that they made the *vita con-*

55. *Science and the Modern World*, p. 116.

56. In the *Seventh Letter* 341C: *rhēton gar oudamōs estin hōs alla mathēmata* ("for it is never to be expressed by words like other things we learn").

57. See esp. *Nicomachean Ethics* 1142a25 ff. and 1143a36 ff. The current English translation distorts the meaning because it renders *logos* as "reason" or "argument."

templativa possible. The reversal concerned only thinking, which from then on was the handmaiden of doing as it had been the *ancilla theologiae*, the handmaiden of contemplating divine truth in medieval philosophy and the handmaiden of contemplating the truth of Being in ancient philosophy. Contemplation itself became altogether meaningless.

The radicality of this reversal is somehow obscured by another kind of reversal, with which it is frequently identified and which, since Plato, has dominated the history of Western thought. Whoever reads the Cave allegory in Plato's *Republic* in the light of Greek history will soon be aware that the *periagōgē*, the turning-about that Plato demands of the philosopher, actually amounts to a reversal of the Homeric world order. Not life after death, as in the Homeric Hades, but ordinary life on earth, is located in a "cave," in an underworld; the soul is not the shadow of the body, but the body the shadow of the soul; and the senseless, ghostlike motion ascribed by Homer to the lifeless existence of the soul after death in Hades is now ascribed to the senseless doings of men who do not leave the cave of human existence to behold the eternal ideas visible in the sky.[58]

In this context, I am concerned only with the fact that the Platonic tradition of philosophical as well as political thought started with a reversal, and that this original reversal determined to a large extent the thought patterns into which Western philosophy almost automatically fell wherever it was not animated by a great and original philosophical impetus. Academic philosophy, as a matter of fact, has ever since been dominated by the never-ending reversals of idealism and materialism, of transcendentalism and immanentism, of realism and nominalism, of hedonism and asceticism, and so on. What matters here is the reversibility of all these systems, that they can be turned "upside down" or "downside up" at any moment in history without requiring for such reversal either historical events or changes in the structural elements involved. The concepts themselves remain the same no matter where they

58. It is particularly Plato's use of the words *eidōlon* and *skia* in the story of the Cave which makes the whole account read like a reversal of and a reply to Homer; for these are the key words in Homer's description of Hades in the *Odyssey*.

are placed in the various systematic orders. Once Plato had succeeded in making these structural elements and concepts reversible, reversals within the course of intellectual history no longer needed more than purely intellectual experience, an experience within the framework of conceptual thinking itself. These reversals already began with the philosophical schools in late antiquity and have remained part of the Western tradition. It is still the same tradition, the same intellectual game with paired antitheses that rules, to an extent, the famous modern reversals of spiritual hierarchies, such as Marx's turning Hegelian dialectic upside down or Nietzsche's revaluation of the sensual and natural as against the supersensual and supernatural.

The reversal we deal with here, the spiritual consequence of Galileo's discoveries, although it has frequently been interpreted in terms of the traditional reversals and hence as integral to the Western history of ideas, is of an altogether different nature. The conviction that objective truth is not given to man but that he can know only what he makes himself is not the result of skepticism but of a demonstrable discovery, and therefore does not lead to resignation but either to redoubled activity or to despair. The world loss of modern philosophy, whose introspection discovered consciousness as the inner sense with which one senses his senses and found it to be the only guaranty of reality, is different not only in degree from the age-old suspicion of the philosophers toward the world and toward the others with whom they shared the world; the philosopher no longer turns from the world of deceptive perishability to another world of eternal truth, but turns away from both and withdraws into himself. What he discovers in the region of the inner self is, again, not an image whose permanence can be beheld and contemplated, but, on the contrary, the constant movement of sensual perceptions and the no less constantly moving activity of the mind. Since the seventeenth century, philosophy has produced the best and least disputed results when it has investigated, through a supreme effort of self-inspection, the processes of the senses and of the mind. In this aspect, most of modern philosophy is indeed theory of cognition and psychology, and in the few instances where the potentialities of the Cartesian method of introspection were fully realized by men like Pascal, Kierkegaard, and Nietzsche, one

is tempted to say that philosophers have experimented with their own selves no less radically and perhaps even more fearlessly than the scientists experimented with nature.

Much as we may admire the courage and respect the extraordinary ingenuity of philosophers throughout the modern age, it can hardly be denied that their influence and importance decreased as never before. It was not in the Middle Ages but in modern thinking that philosophy came to play second and even third fiddle. After Descartes based his own philosophy upon the discoveries of Galileo, philosophy has seemed condemned to be always one step behind the scientists and their ever more amazing discoveries, whose principles it has strived arduously to discover *ex post facto* and to fit into some over-all interpretation of the nature of human knowledge. As such, however, philosophy was not needed by the scientists, who—up to our time, at least—believed that they had no use for a handmaiden, let alone one who would "carry the torch in front of her gracious lady" (Kant). The philosophers became either epistemologists, worrying about an over-all theory of science which the scientists did not need, or they became, indeed, what Hegel wanted them to be, the organs of the *Zeitgeist*, the mouthpieces in which the general mood of the time was expressed with conceptual clarity. In both instances, whether they looked upon nature or upon history, they tried to understand and come to terms with what happened without them. Obviously, philosophy suffered more from modernity than any other field of human endeavor; and it is difficult to say whether it suffered more from the almost automatic rise of activity to an altogether unexpected and unprecedented dignity or from the loss of traditional truth, that is, of the concept of truth underlying our whole tradition.

42

THE REVERSAL WITHIN THE *Vita Activa* AND THE VICTORY OF *Homo Faber*

First among the activities within the *vita activa* to rise to the position formerly occupied by contemplation were the activities of making and fabricating—the prerogatives of *homo faber*. This was

natural enough, since it had been an instrument and therefore man in so far as he is a toolmaker that led to the modern revolution. From then on, all scientific progress has been most intimately tied up with the ever more refined development in the manufacture of new tools and instruments. While, for instance, Galileo's experiments with the fall of heavy bodies could have been made at any time in history if men had been inclined to seek truth through experiments, Michelson's experiment with the interferometer at the end of the nineteenth century relied not merely on his "experimental genius" but "required the general advance in technology," and therefore "could not have been made earlier than it was."[59]

It is not only the paraphernalia of instruments and hence the help man had to enlist from *homo faber* to acquire knowledge that caused these activities to rise from their former humble place in the hierarchy of human capacities. Even more decisive was the element of making and fabricating present in the experiment itself, which produces its own phenomena of observation and therefore depends from the very outset upon man's productive capacities. The use of the experiment for the purpose of knowledge was already the consequence of the conviction that one can know only what he has made himself, for this conviction meant that one might learn about those things man did not make by figuring out and imitating the processes through which they had come into being. The much discussed shift of emphasis in the history of science from the old questions of "what" or "why" something is to the new question of "how" it came into being is a direct consequence of this conviction, and its answer can only be found in the experiment. The experiment repeats the natural process as though man himself were about to make nature's objects, and although in the early stages of the modern age no responsible scientist would have dreamt of the extent to which man actually is capable of "making" nature, he nevertheless from the onset approached it from the standpoint of the One who made it, and this not for practical reasons of technical applicability but exclusively for the "theoretical" reason that certainty in knowledge could not be gained otherwise: "Give me matter and I will build a world from it, that is, give me matter and

59. Whitehead, *Science and the Modern World*, pp. 116–17.

I will show you how a world developed from it."[60] These words of Kant show in a nutshell the modern blending of making and knowing, whereby it is as though a few centuries of knowing in the mode of making were needed as the apprenticeship to prepare modern man for making what he wanted to know.

Productivity and creativity, which were to become the highest ideals and even the idols of the modern age in its initial stages, are inherent standards of *homo faber*, of man as a builder and fabricator. However, there is another and perhaps even more significant element noticeable in the modern version of these faculties. The shift from the "why" and "what" to the "how" implies that the actual objects of knowledge can no longer be things or eternal motions but must be processes, and that the object of science therefore is no longer nature or the universe but the history, the story of the coming into being, of nature or life or the universe. Long before the modern age developed its unprecedented historical consciousness and the concept of history became dominant in modern philosophy, the natural sciences had developed into historical disciplines, until in the nineteenth century they added to the older disciplines of physics and chemistry, of zoology and botany, the new natural sciences of geology or history of the earth, biology or the history of life, anthropology or the history of human life, and, generally, natural history. In all these instances, development, the key concept of the historical sciences, became the central concept of the physical sciences as well. Nature, because it could be known only in processes which human ingenuity, the ingeniousness of *homo faber*, could repeat and remake in the experiment, became a process,[61] and all particular natural things derived their significance and meaning solely from their functions in the over-all process. In the place of the concept of Being we now find the concept of Process. And whereas it is in the nature of Being to appear and thus disclose

60. "Gebet mir Materie, ich will eine Welt daraus bauen! das ist, gebet mir Materie, ich will euch zeigen, wie eine Welt daraus entstehen soll" (see Kant's Preface to his *Allgemeine Naturgeschichte und Theorie des Himmels*).

61. That "nature is a process," that therefore "the ultimate fact for sense-awareness is an event," that natural science deals only with occurrences, happenings, or events, but not with things and that "apart from happenings there is nothing" (see Whitehead, *The Concept of Nature*, pp. 53, 15, 66), belongs among the axioms of modern natural science in all its branches.

itself, it is in the nature of Process to remain invisible, to be something whose existence can only be inferred from the presence of certain phenomena. This process was originally the fabrication process which "disappears in the product," and it was based on the experience of *homo faber*, who knew that a production process necessarily precedes the actual existence of every object.

Yet while this insistence on the process of making or the insistence upon considering every thing as the result of a fabrication process is highly characteristic of *homo faber* and his sphere of experience, the exclusive emphasis the modern age placed on it at the expense of all interest in the things, the products themselves, is quite new. It actually transcends the mentality of man as a toolmaker and fabricator, for whom, on the contrary, the production process was a mere means to an end. Here, from the standpoint of *homo faber*, it was as though the means, the production process or development, was more important than the end, the finished product. The reason for this shift of emphasis is obvious: the scientist made only in order to know, not in order to produce things, and the product was a mere by-product, a side effect. Even today all true scientists will agree that the technical applicability of what they are doing is a mere by-product of their endeavor.

The full significance of this reversal of means and ends remained latent as long as the mechanistic world view, the world view of *homo faber* par excellence, was predominant. This view found its most plausible theory in the famous analogy of the relationship between nature and God with the relationship between the watch and the watchmaker. The point in our context is not so much that the eighteenth-century idea of God was obviously formed in the image of *homo faber* as that in this instance the process character of nature was still limited. Although all particular natural things had already been engulfed in the process from which they had come into being, nature as a whole was not yet a process but the more or less stable end product of a divine maker. The image of watch and watchmaker is so strikingly apposite precisely because it contains both the notion of a process character of nature in the image of the movements of the watch and the notion of its still intact object character in the image of the watch itself and its maker.

It is important at this point to remember that the specifically

modern suspicion toward man's truth-receiving capacities, the mistrust of the given, and hence the new confidence in making and introspection which was inspired by the hope that in human consciousness there was a realm where knowing and producing would coincide, did not arise directly from the discovery of the Archimedean point outside the earth in the universe. They were, rather, the necessary consequences of this discovery for the discoverer himself, in so far as he was and remained an earth-bound creature. This close relationship of the modern mentality with philosophical reflection naturally implies that the victory of *homo faber* could not remain restricted to the employment of new methods in the natural sciences, the experiment and the mathematization of scientific inquiry. One of the most plausible consequences to be drawn from Cartesian doubt was to abandon the attempt to understand nature and generally to know about things not produced by man, and to turn instead exclusively to things that owed their existence to man. This kind of argument, in fact, made Vico turn his attention from natural science to history, which he thought to be the only sphere where man could obtain certain knowledge, precisely because he dealt here only with the products of human activity.[62] The modern discovery of history and historical consciousness owed one of its greatest impulses neither to a new enthusiasm for the greatness of man, his doings and sufferings, nor to the belief that the meaning of human existence can be found in the story of mankind, but to the

62. Vico (*op. cit.*, ch. 4) states explicitly why he turned away from natural science. True knowledge of nature is impossible, because not man but God made it; God can know nature with the same certainty man knows geometry: *Geometrica demonstramus quia facimus; si physica demonstrare possemus, faceremus* ("We can prove geometry because we make it; to prove the physical we would have to make it"). This little treatise, written more than fifteen years before the first edition of the *Scienza Nuova* (1725), is interesting in more than one respect. Vico criticizes all existing sciences, but not yet for the sake of his new science of history; what he recommends is the study of moral and political science, which he finds unduly neglected. It must have been much later that the idea occurred to him that history is made by man as nature is made by God. This biographical development, though quite extraordinary in the early eighteenth century, became the rule approximately one hundred years later: each time the modern age had reason to hope for a new political philosophy, it received a philosophy of history instead.

despair of human reason, which seemed adequate only when confronted with man-made objects.

Prior to the modern discovery of history but closely connected with it in its impulses are the seventeenth-century attempts to formulate new political philosophies or, rather, to invent the means and instruments with which to "make an artificial animal . . . called a Commonwealth, or State."[63] With Hobbes as with Descartes "the prime mover was doubt,"[64] and the chosen method to establish the "art of man," by which he would make and rule his own world as "God hath made and governs the world" by the art of nature, is also introspection, "to read in himself," since this reading will show him "the similitude of the thoughts and passions of one man to the thoughts and passions of another." Here, too, the rules and standards by which to build and judge this most human of human "works of art"[65] do not lie outside of men, are not something men have in common in a worldly reality perceived by the senses or by the mind. They are, rather, inclosed in the inwardness of man, open only to introspection, so that their very validity rests on the assumption that "not . . . the objects of the passions" but the passions themselves are the same in every specimen of the species man-kind Here again we find the image of the watch, this time applied to the human body and then used for the movements of the passions. The establishment of the Commonwealth, the human creation of "an artificial man," amounts to the building of an "automaton [an engine] that moves [itself] by springs and wheels as doth a watch."

In other words, the process which, as we saw, invaded the natural sciences through the experiment, through the attempt to imitate under artificial conditions the process of "making" by which a natural thing came into existence, serves as well or even better as the principle for doing in the realm of human affairs. For here the processes of inner life, found in the passions through introspection, can become the standards and rules for the creation of the "auto-

63. Hobbes's Introduction to the *Leviathan.*

64. See Michael Oakeshott's excellent Introduction to the *Leviathan* (Blackwell's Political Texts), p. xiv.

65. *Ibid.*, p. lxiv.

matic" life of that "artificial man" who is "the great Leviathan." The results yielded by introspection, the only method likely to deliver certain knowledge, are in the nature of movements: only the objects of the senses remain as they are and endure, precede and survive, the act of sensation; only the objects of the passions are permanent and fixed to the extent that they are not devoured by the attainment of some passionate desire; only the objects of thoughts, but never thinking itself, are beyond motion and perishability. Processes, therefore, and not ideas, the models and shapes of the things to be, become the guide for the making and fabricating activities of *homo faber* in the modern age.

Hobbes's attempt to introduce the new concepts of making and reckoning into political philosophy—or, rather, his attempt to apply the newly discovered aptitudes of making to the realm of human affairs—was of the greatest importance; modern rationalism as it is currently known, with the assumed antagonism of reason and passion as its stock-in-trade, has never found a clearer and more uncompromising representative. Yet it was precisely the realm of human affairs where the new philosophy was first found wanting, because by its very nature it could not understand or even believe in reality. The idea that only what I am going to make will be real—perfectly true and legitimate in the realm of fabrication—is forever defeated by the actual course of events, where nothing happens more frequently than the totally unexpected. To act in the form of making, to reason in the form of "reckoning with consequences," means to leave out the unexpected, the event itself, since it would be unreasonable or irrational to expect what is no more than an "infinite improbability." Since, however, the event constitutes the very texture of reality within the realm of human affairs, where the "wholly improbable happens regularly," it is highly unrealistic not to reckon with it, that is, not to reckon with something with which nobody can safely reckon. The political philosophy of the modern age, whose greatest representative is still Hobbes, founders on the perplexity that modern rationalism is unreal and modern realism is irrational—which is only another way of saying that reality and human reason have parted company. Hegel's gigantic enterprise to reconcile spirit with reality (*den Geist mit der Wirklichkeit zu versöhnen*), a reconciliation that is the

deepest concern of all modern theories of history, rested on the insight that modern reason foundered on the rock of reality.

The fact that modern world alienation was radical enough to extend even to the most worldly of human activities, to work and reification, the making of things and the building of a world, distinguishes modern attitudes and evaluations even more sharply from those of tradition than a mere reversal of contemplation and action, of thinking and doing, would indicate. The break with contemplation was consummated not with the elevation of man the maker to the position formerly held by man the contemplator, but with the introduction of the concept of process into making. Compared with this, the striking new arrangement of hierarchical order within the *vita activa*, where fabrication now came to occupy a rank formerly held by political action, is of minor importance. We saw before that this hierarchy had in fact, though not expressly, already been overruled in the very beginnings of political philosophy by the philosophers' deep-rooted suspicion of politics in general and action in particular.

The matter is somewhat confused because Greek political philosophy still follows the order laid down by the *polis* even when it turns against it; but in their strictly philosophical writings (to which, of course, one must turn if he wants to know their innermost thoughts), Plato as well as Aristotle tends to invert the relationship between work and action in favor of work. Thus Aristotle, in a discussion of the different kinds of cognition in his *Metaphysics*, places *dianoia* and *epistēmē praktikē*, practical insight and political science, at the lowest rank of his order, and puts above them the science of fabrication, *epistēmē poiētikē*, which immediately precedes and leads to *theōria*, the contemplation of truth.[66] And the reason for this predilection in philosophy is by no means the politically inspired suspicion of action which we mentioned before, but the philosophically much more compelling one that contemplation and fabrication (*theōria* and *poiēsis*) have an inner affinity and do not stand in the same unequivocal opposition to each other as contemplation and action. The decisive point of similarity, at least in Greek philosophy, was that contemplation, the beholding of something, was considered to be an inherent ele-

66. *Metaphysics* 1025b25 ff., 1064a17 ff.

ment in fabrication as well, inasmuch as the work of the craftsman was guided by the "idea," the model beheld by him before the fabrication process had started as well as after it had ended, first to tell him what to make and then to enable him to judge the finished product.

Historically, the source of this contemplation, which we find for the first time described in the Socratic school, is at least twofold. On one hand, it stands in obvious and consistent connection with the famous contention of Plato, quoted by Aristotle, that *thaumazein*, the shocked wonder at the miracle of Being, is the beginning of all philosophy.[67] It seems to me highly probable that this Platonic contention is the immediate result of an experience, perhaps the most striking one, that Socrates offered his disciples: the sight of him time and again suddenly overcome by his thoughts and thrown into a state of absorption to the point of perfect motionlessness for many hours. It seems no less plausible that this shocked wonder should be essentially speechless, that is, that its actual content should be untranslatable into words. This, at least, would explain why Plato and Aristotle, who held *thaumazein* to be the beginning of philosophy, should also agree—despite so many and such decisive disagreements—that some state of speechlessness, the essentially speechless state of contemplation, was the end of philosophy. *Theōria*, in fact, is only another word for *thaumazein;* the contemplation of truth at which the philosopher ultimately arrives is the philosophically purified speechless wonder with which he began.

There is, however, another side to this matter, which shows itself most articulately in Plato's doctrine of ideas, in its content as well as in its terminology and exemplifications. These reside in the experiences of the craftsman, who sees before his inner eye the shape of the model according to which he fabricates his object. To

67. For Plato see *Theaetetus* 155: *Mala gar philosophou touto to pathos, to thaumazein; ou gar allē archē philosophias ē hautē* ("For wonder is what the philosopher endures most; for there is no other beginning of philosophy than this"). Aristotle, who at the beginning of the *Metaphysics* (982b12 ff.) seems to repeat Plato almost verbatim—"For it is owing to their wonder that men both now begin and at first began to philosophize"—actually uses this wonder in an altogether different way; to him, the actual impulse to philosophize lies in the desire "to escape ignorance."

Plato, this model, which craftsmanship can only imitate but not create, is no product of the human mind but given to it. As such it possesses a degree of permanence and excellence which is not actualized but on the contrary spoiled in its materialization through the work of human hands. Work makes perishable and spoils the excellence of what remained eternal so long as it was the object of mere contemplation. Therefore, the proper attitude toward the models which guide work and fabrication, that is, toward Platonic ideas, is to leave them as they are and appear to the inner eye of the mind. If man only renounces his capacity for work and does not do anything, he can behold them and thus participate in their eternity. Contemplation, in this respect, is quite unlike the enraptured state of wonder with which man responds to the miracle of Being as a whole. It is and remains part and parcel of a fabrication process even though it has divorced itself from all work and all doing; in it, the beholding of the model, which now no longer is to guide any doing, is prolonged and enjoyed for its own sake.

In the tradition of philosophy, it is this second kind of contemplation that became the predominant one. Therefore the motionlessness which in the state of speechless wonder is no more than an incidental, unintended result of absorption, becomes now the condition and hence the outstanding characteristic of the *vita contemplativa.* It is not wonder that overcomes and throws man into motionlessness, but it is through the conscious cessation of activity, the activity of making, that the contemplative state is reached. If one reads medieval sources on the joys and delights of contemplation, it is as though the philosophers wanted to make sure that *homo faber* would heed the call and let his arms drop, finally realizing that his greatest desire, the desire for permanence and immortality, cannot be fulfilled by his doings, but only when he realizes that the beautiful and eternal cannot be made. In Plato's philosophy, speechless wonder, the beginning and the end of philosophy, together with the philosopher's love for the eternal and the craftsman's desire for permanence and immortality, permeate each other until they are almost indistinguishable. Yet the very fact that the philosophers' speechless wonder seemed to be an experience reserved for the few, while the craftsmen's contemplative glance was

known by many, weighed heavily in favor of a contemplation primarily derived from the experiences of *homo faber*. It already weighed heavily with Plato, who drew his examples from the realm of making because they were closer to a more general human experience, and it weighed even more heavily where some kind of contemplation and meditation was required of everybody, as in medieval Christianity.

Thus it was not primarily the philosopher and philosophic speechless wonder that molded the concept and practice of contemplation and the *vita contemplativa*, but rather *homo faber* in disguise; it was man the maker and fabricator, whose job it is to do violence to nature in order to build a permanent home for himself, and who now was persuaded to renounce violence together with all activity, to leave things as they are, and to find his home in the contemplative dwelling in the neighborhood of the imperishable and eternal. *Homo faber* could be persuaded to this change of attitude because he knew contemplation and some of its delights from his own experience; he did not need a complete change of heart, a true *periagōgē*, a radical turnabout. All he had to do was let his arms drop and prolong indefinitely the act of beholding the *eidos*, the eternal shape and model he had formerly wanted to imitate and whose excellence and beauty he now knew he could only spoil through any attempt at reification.

If, therefore, the modern challenge to the priority of contemplation over every kind of activity had done no more than turn upside down the established order between making and beholding, it would still have remained in the traditional framework. This framework was forced wide open, however, when in the understanding of fabrication itself the emphasis shifted entirely away from the product and from the permanent, guiding model to the fabrication process, away from the question of what a thing is and what kind of thing was to be produced to the question of how and through which means and processes it had come into being and could be reproduced. For this implied both that contemplation was no longer believed to yield truth and that it had lost its position in the *vita activa* itself and hence within the range of ordinary human experience.

43

THE DEFEAT OF *Homo Faber* AND THE PRINCIPLE OF HAPPINESS

If one considers only the events that led into the modern age and reflects solely upon the immediate consequences of Galileo's discovery, which must have struck the great minds of the seventeenth century with the compelling force of self-evident truth, the reversal of contemplation and fabrication, or rather the elimination of contemplation from the range of meaningful human capacities, is almost a matter of course. It seems equally plausible that this reversal should have elevated *homo faber*, the maker and fabricator, rather than man the actor or man as *animal laborans*, to the highest range of human possibilities.

And, indeed, among the outstanding characteristics of the modern age from its beginning to our own time we find the typical attitudes of *homo faber:* his instrumentalization of the world, his confidence in tools and in the productivity of the maker of artificial objects; his trust in the all-comprehensive range of the means-end category, his conviction that every issue can be solved and every human motivation reduced to the principle of utility; his sovereignty, which regards everything given as material and thinks of the whole of nature as of "an immense fabric from which we can cut out whatever we want to resew it however we like";[68] his equation of intelligence with ingenuity, that is, his contempt for all

68. Henri Bergson, *Évolution créatrice* (1948), p. 157. An analysis of Bergson's position in modern philosophy would lead us too far afield. But his insistence on the priority of *homo faber* over *homo sapiens* and on fabrication as the source of human intelligence, as well as his emphatic opposition of life to intelligence, is very suggestive. Bergson's philosophy could easily be read like a case study of how the modern age's earlier conviction of the relative superiority of making over thinking was then superseded and annihilated by its more recent conviction of an absolute superiority of life over everything else. It is because Bergson himself still united both of these elements that he could exert such a decisive influence on the beginnings of labor theories in France. Not only the earlier works of Édouard Berth and Georges Sorel, but also Adriano Tilgher's *Homo faber* (1929), owe their terminology chiefly to Bergson; this is still true of Jules Vuillemin's *L'Être et le travail* (1949), although Vuillemin, like almost every present-day French writer, thinks primarily in Hegelian terms.

thought which cannot be considered to be "the first step . . . for the fabrication of artificial objects, particularly of tools to make tools, and to vary their fabrication indefinitely";[69] finally, his matter-of-course identification of fabrication with action.

It would lead us too far afield to follow the ramifications of this mentality, and it is not necessary, for they are easily detected in the natural sciences, where the purely theoretical effort is understood to spring from the desire to create order out of "mere disorder," the "wild variety of nature,"[70] and where therefore *homo faber*'s predilection for patterns for things to be produced replaces the older notions of harmony and simplicity. It can be found in classical economics, whose highest standard is productivity and whose prejudice against non-productive activities is so strong that even Marx could justify his plea for justice for laborers only by misrepresenting the laboring, non-productive activity in terms of work and fabrication. It is most articulate, of course, in the pragmatic trends of modern philosophy, which are not only characterized by Cartesian world alienation but also by the unanimity with which English philosophy from the seventeenth century onward and French philosophy in the eighteenth century adopted the principle of utility as the key which would open all doors to the explanation of human motivation and behavior. Generally speaking, the oldest conviction of *homo faber*—that "man is the measure of all things"—advanced to the rank of a universally accepted commonplace.

What needs explanation is not the modern esteem of *homo faber* but the fact that this esteem was so quickly followed by the elevation of laboring to the highest position in the hierarchical order of the *vita activa*. This second reversal of hierarchy within the *vita activa* came about more gradually and less dramatically than either the reversal of contemplation and action in general or the reversal of action and fabrication in particular. The elevation of laboring was preceded by certain deviations and variations from the traditional mentality of *homo faber* which were highly characteristic of the modern age and which, indeed, arose almost automatically from the very nature of the events that ushered it in. What changed

69. Bergson, *op. cit.*, p. 140.

70. Bronowski, *op. cit.*

the mentality of *homo faber* was the central position of the concept of process in modernity. As far as *homo faber* was concerned, the modern shift of emphasis from the "what" to the "how," from the thing itself to its fabrication process, was by no means an unmixed blessing. It deprived man as maker and builder of those fixed and permanent standards and measurements which, prior to the modern age, have always served him as guides for his doing and criteria for his judgment. It is not only and perhaps not even primarily the development of commercial society that, with the triumphal victory of exchange value over use value, first introduced the principle of interchangeability, then the relativization, and finally the devaluation, of all values. For the mentality of modern man, as it was determined by the development of modern science and the concomitant unfolding of modern philosophy, it was at least as decisive that man began to consider himself part and parcel of the two superhuman, all-encompassing processes of nature and history, both of which seemed doomed to an infinite progress without ever reaching any inherent *telos* or approaching any preordained idea.

Homo faber, in other words, as he arose from the great revolution of modernity, though he was to acquire an undreamed-of ingenuity in devising instruments to measure the infinitely large and the infinitely small, was deprived of those permanent measures that precede and outlast the fabrication process and form an authentic and reliable absolute with respect to the fabricating activity. Certainly, none of the activities of the *vita activa* stood to lose as much through the elimination of contemplation from the range of meaningful human capacities as fabrication. For unlike action, which partly consists in the unchaining of processes, and unlike laboring, which follows closely the metabolic process of biological life, fabrication experiences processes, if it is aware of them at all, as mere means toward an end, that is, as something secondary and derivative. No other capacity, moreover, stood to lose as much through modern world alienation and the elevation of introspection into an omnipotent device to conquer nature as those faculties which are primarily directed toward the building of the world and the production of worldly things.

Nothing perhaps indicates clearer the ultimate failure of *homo faber* to assert himself than the rapidity with which the principle of

utility, the very quintessence of his world view, was found wanting and was superseded by the principle of "the greatest happiness of the greatest number."[71] When this happened it was manifest that the conviction of the age that man can know only what he makes himself—which seemingly was so eminently propitious to a full victory of *homo faber*—would be overruled and eventually destroyed by the even more modern principle of process, whose concepts and categories are altogether alien to the needs and ideals of *homo faber*. For the principle of utility, though its point of reference is clearly man, who uses matter to produce things, still presupposes a world of use objects by which man is surrounded and in which he moves. If this relationship between man and world is no longer secure, if worldly things are no longer primarily considered in their usefulness but as more or less incidental results of the production process which brought them into being, so that the end product of the production process is no longer a true end and the produced thing is valued not for the sake of its predetermined usage but "for its production of something else," then, obviously, the objection can be "raised that . . . its value is secondary only, and a world that contains no primary values can contain no secondary ones either."[72] This radical loss of values within the restricted

71. Jeremy Bentham's formula in *An Introduction to the Principles of Morals and Legislation* (1789) was "suggested to him by Joseph Priestley and closely resembled Beccaria's *la massima felicità divisa nel maggior numero*" (Introduction to the Hafner edition by Laurence J. Lafleur). According to Élie Halévy (*The Growth of Philosophic Radicalism* [Beacon Press, 1955]), both Beccaria and Bentham were indebted to Helvétius' *De l'esprit*.

72. Lafleur, *op. cit.*, p. xi. Bentham himself expresses his dissatisfaction with a merely utilitarian philosophy in the note added to a late edition of his work (Hafner ed., p. 1): "The word *utility* does not so clearly point to the ideas of *pleasure* and *pain* as the words *happiness* and *felicity* do." His chief objection is that utility is not measurable and therefore does not "lead us to the consideration of the *number*," without which a "formation of the standard of right and wrong" would not be possible. Bentham derives his happiness principle from the utility principle by divorcing the concept of utility from the notion of usage (see ch. 1, par. 3). This separation marks a turning point in the history of utilitarianism. For while it is true that the utility principle had been related primarily to the ego prior to Bentham, it is only Bentham who radically emptied the idea of utility of all reference to an independent world of use things and thus transformed utilitarianism into a truly "universalized egoism" (Halévy).

frame of reference of *homo faber* himself occurs almost automatically as soon as he defines himself not as the maker of objects and the builder of the human artifice who incidentally invents tools, but considers himself primarily a toolmaker and "particularly [a maker] of tools to make tools" who only incidentally also produces things. If one applies the principle of utility in this context at all, then it refers primarily not to use objects and not to usage but to the production process. Now what helps stimulate productivity and lessens pain and effort is useful. In other words, the ultimate standard of measurement is not utility and usage at all, but "happiness," that is, the amount of pain and pleasure experienced in the production or in the consumption of things.

Bentham's invention of the "pain and pleasure calculus" combined the advantage of seemingly introducing the mathematical method into the moral sciences with the even greater attraction of having found a principle which resided entirely on introspection. His "happiness," the sum total of pleasures minus pains, is as much an inner sense which senses sensations and remains unrelated to worldly objects as the Cartesian consciousness that is conscious of its own activity. Moreover, Bentham's basic assumption that what all men have in common is not the world but the sameness of their own nature, which manifests itself in the sameness of calculation and the sameness of being affected by pain and pleasure, is directly derived from the earlier philosophers of the modern age. For this philosophy, "hedonism" is even more of a misnomer than for the epicureanism of late antiquity, to which modern hedonism is only superficially related. The principle of all hedonism, as we saw before, is not pleasure but avoidance of pain, and Hume, who in contradistinction to Bentham was still a philosopher, knew quite well that he who wants to make pleasure the ultimate end of all human action is driven to admit that not pleasure but pain, not desire but fear, are his true guides. "If you . . . inquire, why [somebody] desires health, he will readily reply, because sickness is painful. If you push your inquiries further and desire a reason why he hates pain, it is impossible he can ever give any. This is an ultimate end, and is never referred to by any other object."[73] The reason for this impossibility is that only pain is completely inde-

73. Quoted from Halévy, *op. cit.*, p. 13.

pendent of any object, that only one who is in pain really senses nothing but himself; pleasure does not enjoy itself but something besides itself. Pain is the only inner sense found by introspection which can rival in independence from experienced objects the self-evident certainty of logical and arithmetical reasoning.

While this ultimate foundation of hedonism in the experience of pain is true for both its ancient and modern varieties, in the modern age it acquires an altogether different and much stronger emphasis. For here it is by no means the world, as in antiquity, that drives man into himself to escape the pains it may inflict, under which circumstance both pain and pleasure still retain a good deal of their worldly significance. Ancient world alienation in all its varieties—from stoicism to epicureanism down to hedonism and cynicism—had been inspired by a deep mistrust of the world and moved by a vehement impulse to withdraw from worldly involvement, from the trouble and pain it inflicts, into the security of an inward realm in which the self is exposed to nothing but itself. Their modern counterparts—puritanism, sensualism, and Bentham's hedonism—on the contrary, were inspired by an equally deep mistrust of man as such; they were moved by doubt of the adequacy of the human senses to receive reality, the adequacy of human reason to receive truth, and hence by the conviction of the deficiency or even depravity of human nature.

This depravity is not Christian or biblical either in origin or in content, although it was of course interpreted in terms of original sin, and it is difficult to say whether it is more harmful and repulsive when puritans denounce man's corruptness or when Benthamites brazenly hail as virtues what men always have known to be vices. While the ancients had relied upon imagination and memory, the imagination of pains from which they were free or the memory of past pleasures in situations of acute painfulness, to convince themselves of their happiness, the moderns needed the calculus of pleasure or the puritan moral bookkeeping of merits and transgressions to arrive at some illusory mathematical certainty of happiness or salvation. (These moral arithmetics are, of course, quite alien to the spirit pervading the philosophic schools of late antiquity. Moreover, one need only reflect on the rigidity of self-imposed discipline and the concomitant nobility of character, so manifest in

those who had been formed by ancient stoicism or epicureanism, to become aware of the gulf by which these versions of hedonism are separated from modern puritanism, sensualism, and hedonism. For this difference, it is almost irrelevant whether the modern character is still formed by the older narrow-minded, fanatic self-righteousness or has yielded to the more recent self-centered and self-indulgent egotism with its infinite variety of futile miseries.) It seems more than doubtful that the "greatest happiness principle" would have achieved its intellectual triumphs in the English-speaking world if no more had been involved than the questionable discovery that "nature has placed mankind under the governance of two sovereign masters, pain and pleasure,"[74] or the absurd idea of establishing morals as an exact science by isolating "in the human soul that feeling which seems to be the most easily measurable."[75]

Hidden behind this as behind other, less interesting variations of the sacredness of egoism and the all-pervasive power of self-interest, which were current to the point of being commonplace in the eighteenth and early nineteenth centuries, we find another point of reference which indeed forms a much more potent principle than any pain-pleasure calculus could ever offer, and that is the principle of life itself. What pain and pleasure, fear and desire, are actually supposed to achieve in all these systems is not happiness at all but the promotion of individual life or a guaranty of the survival of mankind. If modern egoism were the ruthless search for pleasure (called happiness) it pretends to be, it would not lack what in all truly hedonistic systems is an indispensable element of argumentation—a radical justification of suicide. This lack alone indicates that in fact we deal here with life philosophy in its most vulgar and least critical form. In the last resort, it is always life itself which is the supreme standard to which everything else is referred, and the

74. This, of course, is the first sentence of the *Principles of Morals and Legislation.* The famous sentence is "copied almost word for word from Helvétius" (Halévy, *op. cit.*, p. 26). Halévy rightly remarks that "it was natural that a current idea should on all sides rather tend to find expression in the same formulae" (p. 22). This fact, incidentally, clearly shows that the authors we deal with here are not philosophers; for no matter how current certain ideas might be during a given period, there never are two philosophers who could arrive at identical formulations without copying from each other.

75. *Ibid.*, p. 15.

interests of the individual as well as the interests of mankind are always equated with individual life or the life of the species as though it were a matter of course that life is the highest good.

The curious failure of *homo faber* to assert himself under conditions seemingly so extraordinarily propitious could also have been illustrated by another, philosophically even more relevant, revision of basic traditional beliefs. Hume's radical criticism of the causality principle, which prepared the way for the later adoption of the principle of evolution, has often been considered one of the origins of modern philosophy. The causality principle with its twofold central axiom—that everything that is must have a cause (*nihil sine causa*) and that the cause must be more perfect than its most perfect effect—obviously relies entirely on experiences in the realm of fabrication, where the maker is superior to his products. Seen in this context, the turning point in the intellectual history of the modern age came when the image of organic life development—where the evolution of a lower being, for instance the ape, can cause the appearance of a higher being, for instance man—appeared in the place of the image of the watchmaker who must be superior to all watches whose cause he is.

Much more is implied in this change than the mere denial of the lifeless rigidity of a mechanistic world view. It is as though in the latent seventeenth-century conflict between the two possible methods to be derived from the Galilean discovery, the method of the experiment and of making on one hand and the method of introspection on the other, the latter was to achieve a somewhat belated victory. For the only tangible object introspection yields, if it is to yield more than an entirely empty consciousness of itself, is indeed the biological process. And since this biological life, accessible in self-observation, is at the same time a metabolic process between man and nature, it is as though introspection no longer needs to get lost in the ramifications of a consciousness without reality, but has found within man—not in his mind but in his bodily processes—enough outside matter to connect him again with the outer world. The split between subject and object, inherent in human consciousness and irremediable in the Cartesian opposition of man as a *res cogitans* to a surrounding world of *res extensae*, disappears altogether in the case of a living organism, whose very survival depends upon

the incorporation, the consumption, of outside matter. Naturalism, the nineteenth-century version of materialism, seemed to find in life the way to solve the problems of Cartesian philosophy and at the same time to bridge the ever-widening chasm between philosophy and science.[76]

44

LIFE AS THE HIGHEST GOOD

Tempting as it may be for the sake of sheer consistency to derive the modern life concept from the self-inflicted perplexities of modern philosophy, it would be a delusion and a grave injustice to the seriousness of the problems of the modern age if one looked upon them merely from the viewpoint of the development of ideas. The defeat of *homo faber* may be explainable in terms of the initial transformation of physics into astrophysics, of natural sciences into a "universal" science. What still remains to be explained is why this defeat ended with a victory of the *animal laborans;* why, with the rise of the *vita activa*, it was precisely the laboring activity that was to be elevated to the highest rank of man's capacities or, to put it another way, why within the diversity of the human condition with its various human capacities it was precisely life that overruled all other considerations.

The reason why life asserted itself as the ultimate point of reference in the modern age and has remained the highest good of mod-

76. The greatest representatives of modern life philosophy are Marx, Nietzsche, and Bergson, inasmuch as all three equate Life and Being. For this equation, they rely on introspection, and life is indeed the only "being" man can possibly be aware of by looking merely into himself. The difference between these and the earlier philosophers of the modern age is that life appears to be more active and more productive than consciousness, which seems to be still too closely related to contemplation and the old ideal of truth. This last stage of modern philosophy is perhaps best described as the rebellion of the philosophers against philosophy, a rebellion which, beginning with Kierkegaard and ending in existentialism, appears at first glance to emphasize action as against contemplation. Upon closer inspection, however, none of these philosophers is actually concerned with action as such. We may leave aside here Kierkegaard and his non-worldly, inward-directed acting. Nietzsche and Bergson describe action in terms of fabrication—*homo faber* instead of *homo sapiens*—just as Marx thinks of acting in terms of making and describes labor in terms of work. But their ultimate point of reference is not work and worldliness any more than action; it is life and life's fertility.

ern society is that the modern reversal operated within the fabric of a Christian society whose fundamental belief in the sacredness of life has survived, and has even remained completely unshaken by, secularization and the general decline of the Christian faith. In other words, the modern reversal followed and left unchallenged the most important reversal with which Christianity had broken into the ancient world, a reversal that was politically even more far-reaching and, historically at any rate, more enduring than any specific dogmatic content or belief. For the Christian "glad tidings" of the immortality of individual human life had reversed the ancient relationship between man and world and promoted the most mortal thing, human life, to the position of immortality, which up to then the cosmos had held.

Historically, it is more than probable that the victory of the Christian faith in the ancient world was largely due to this reversal, which brought hope to those who knew that their world was doomed, indeed a hope beyond hope, since the new message promised an immortality they never had dared to hope for. This reversal could not but be disastrous for the esteem and the dignity of politics. Political activity, which up to then had derived its greatest inspiration from the aspiration toward worldly immortality, now sank to the low level of an activity subject to necessity, destined to remedy the consequences of human sinfulness on one hand and to cater to the legitimate wants and interests of earthly life on the other. Aspiration toward immortality could now only be equated with vainglory; such fame as the world could bestow upon man was an illusion, since the world was even more perishable than man, and a striving for worldly immortality was meaningless, since life itself was immortal.

It is precisely individual life which now came to occupy the position once held by the "life" of the body politic, and Paul's statement that "death is the wages of sin," since life is meant to last forever, echoes Cicero's statement that death is the reward of sins committed by political communities which were built to last for eternity.[77] It is as though the early Christians—at least Paul,

77. Cicero's remark: *Civitatibus autem mors ipsa poena est . . . debet enim constituta sic esse civitas ut aeterna sit* (*De republica* iii. 23). For the conviction in antiquity that a well-founded body politic should be immortal, see also Plato, *Laws* 713,

who after all was a Roman citizen—consciously shaped their concept of immortality after the Roman model, substituting individual life for the political life of the body politic. Just as the body politic possesses only a potential immortality which can be forfeited by political transgressions, individual life had once forfeited its guaranteed immortality in Adam's fall and now, through Christ, had regained a new, potentially everlasting life which, however, could again be lost in a second death through individual sin.

Certainly, Christian emphasis on the sacredness of life is part and parcel of the Hebrew heritage, which already presented a striking contrast to the attitudes of antiquity: the pagan contempt for the hardships which life imposes upon man in labor and giving birth, the envious picture of the "easy life" of the gods, the custom of exposing unwanted offspring, the conviction that life without health is not worth living (so that the physician, for instance, is held to have misunderstood his calling when he prolongs life where he cannot restore health)[78] and that suicide is a noble gesture to escape a life that has become burdensome. Still, one need only remember how the Decalogue enumerates the offense of murder, without any special emphasis, among a number of other transgressions—which to our way of thinking can hardly compete in gravity with this supreme crime—to realize that not even the Hebrew legal code, though much closer to our own than any pagan scale of offenses, made the preservation of life the cornerstone of the legal system of the Jewish people. This intermediary position which the Hebrew legal code occupies between pagan antiquity and all Christian or post-Christian legal systems may be explicable by the Hebrew creed which stresses the potential immortality of the people, as distinguished from the pagan immortality of the world on one side and the Christian immortality of individual life on the other. At any event, this Christian immortality that is bestowed upon the person, who in his uniqueness begins life by birth on earth, resulted not only in the more obvious increase of otherworldliness, but also in an enormously increased importance of life

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where the founders of a new *polis* are told to imitate the immortal part in man (*hoson en hēmin athanasias enest*).

78. See Plato *Republic* 405C.

on earth. The point is that Christianity—except for heretical and gnostic speculations—always insisted that life, though it had no longer a final end, still has a definite beginning. Life on earth may be only the first and the most miserable stage of eternal life; it still is life, and without this life that will be terminated in death, there cannot be eternal life. This may be the reason for the undisputable fact that only when the immortality of individual life became the central creed of Western mankind, that is, only with the rise of Christianity, did life on earth also become the highest good of man.

Christian emphasis on the sacredness of life tended to level out the ancient distinctions and articulations within the *vita activa;* it tended to view labor, work, and action as equally subject to the necessity of present life. At the same time it helped to free the laboring activity, that is, whatever is necessary to sustain the biological process itself, from some of the contempt in which antiquity had held it. The old contempt toward the slave, who had been despised because he served only life's necessities and submitted to the compulsion of his master because he wanted to stay alive at all costs, could not possibly survive in the Christian era. One could no longer with Plato despise the slave for not having committed suicide rather than submit to a master, for to stay alive under all circumstances had become a holy duty, and suicide was regarded as worse than murder. Not the murderer, but he who had put an end to his own life was refused a Christian burial.

Yet contrary to what some modern interpreters have tried to read into Christian sources, there are no indications of the modern glorification of laboring in the New Testament or in other premodern Christian writers. Paul, who has been called "the apostle of labor,"[79] was nothing of the sort, and the few passages on which

79. By the Dominican Bernard Allo, *Le travail d'après St. Paul* (1914). Among the defenders of the Christian origin of modern glorification of labor are: in France, Étienne Borne and François Henry, *Le travail et l'homme* (1937); in Germany, Karl Müller, *Die Arbeit: Nach moral-philosophischen Grundsätzen des heiligen Thomas von Aquino* (1912). More recently, Jacques Leclercq from Louvain, who has contributed one of the most valuable and interesting works to the philosophy of labor in the fourth book of his *Leçons de droit naturel*, entitled *Travail, propriété* (1946), has rectified this misinterpretation of the Christian sources: "Le christianisme n'a pas changé grand'chose à l'estime du travail";

this claim is based either are addressed to those who out of laziness "ate other men's bread" or they recommend labor as a good means to keep out of trouble, that is, they reinforce the general prescription of a strictly private life and warn of political activities.[80] It is even more relevant that in later Christian philosophy, and particularly in Thomas Aquinas, labor had become a duty for those who had no other means to keep alive, the duty consisting in keeping one's self alive and not in laboring; if one could provide for himself through beggary, so much the better. Whoever reads the sources without modern prolabor prejudices will be surprised at how little the church fathers availed themselves even of the obvious opportunity to justify labor as punishment for original sin. Thus Thomas does not hesitate to follow Aristotle rather than the Bible in this question and to assert that "only the necessity to keep alive compels to do manual labor."[81] Labor to him is nature's way of keeping the human species alive, and from this he concludes that it is by no means necessary that all men earn their bread by the sweat of their brows, but that this is rather a kind of last and desperate resort to solve the problem or fulfil the duty.[82] Not even the use of labor as a means with which to ward off the dangers of otiosity is a new Christian discovery, but was already a commonplace of Roman morality. In complete agreement with ancient convictions about the character of the laboring activity, finally, is the frequent Christian use for the mortification of the flesh, where labor, especially in the monasteries, sometimes played the same role as other painful exercises and forms of self-torture.[83]

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and in Aquinas' work "la notion du travail n'apparaît que fort accidentellement" (pp. 61–62).

80. See I Thess. 4:9–12 and II Thess. 3:8–12.

81. *Summa contra Gentiles* iii. 135: *Sola enim necessitas victus cogit manibus operari.*

82. *Summa theologica* ii. 2. 187. 3, 5.

83. In the monastic rules, particularly in the *ora et labora* of Benedict, labor is recommended against the temptations of an idle body (see ch. 48 of the rule). In the so-called rule of Augustine (*Epistolae* 211), labor is considered to be a law of nature, not a punishment for sin. Augustine recommends manual labor—he uses the words *opera* and *labor* synonymously as the opposite of *otium*—for three

The reason why Christianity, its insistence on the sacredness of life and on the duty to stay alive notwithstanding, never developed a positive labor philosophy lies in the unquestioned priority given to the *vita contemplativa* over all kinds of human activities. *Vita contemplativa simpliciter melior est quam vita activa* ("the life of contemplation is simply better than the life of action"), and whatever the merits of an active life might be, those of a life devoted to contemplation are "more effective and more powerful."[84] This conviction, it is true, can hardly be found in the preachings of Jesus of Nazareth, and it is certainly due to the influence of Greek philosophy; yet even if medieval philosophy had kept closer to the spirit of the Gospels, it could hardly have found there any reason for a glorification of laboring.[85] The only activity Jesus of Nazareth recommends in his preachings is action, and the only human capacity he stresses is the capacity "to perform miracles."

However that may be, the modern age continued to operate under the assumption that life, and not the world, is the highest good of man; in its boldest and most radical revisions and criticisms of traditional beliefs and concepts, it never even thought of challenging this fundamental reversal which Christianity had brought into

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reasons: it helps to fight the temptations of otiosity; it helps the monasteries to fulfil their duty of charity toward the poor; and it is favorable to contemplation because it does not engage the mind unduly like other occupations, for instance, the buying and selling of goods. For the role of labor in the monasteries, compare Étienne Delaruelle, "Le travail dans les règles monastiques occidentales du 4e au 9e siècle," *Journal de psychologie normale et pathologique*, Vol. XLI, No. 1 (1948). Apart from these formal considerations, it is quite characteristic that the Solitaires de Port-Royal, looking for some instrument of really effective punishment, thought immediately of labor (see Lucien Fèbre, "Travail: Évolution d'un mot et d'une idée," *Journal de psychologie normale et pathologique*, Vol. XLI, No. 1 [1948]).

84. Aquinas *Summa theologica* ii. 2. 182. 1, 2. In his insistence on the absolute superiority of the *vita contemplativa*, Thomas shows a characteristic difference from Augustine, who recommends the *inquisitio, aut inventio veritatis: ut in ea quisque proficiat*—"inquisition or discovery of truth so that somebody may profit from it" (*De civitate Dei* xix. 19). But this difference is hardly more than the difference between a Christian thinker formed by Greek, and another by Roman, philosophy.

85. The Gospels are concerned with the evil of earthly possessions, not with the praise of labor or laborers (see esp. Matt. 6:19–32, 19:21–24; Mark 4:19; Luke 6:20–34, 18:22–25; Acts 4:32–35).

the dying ancient world. No matter how articulate and how conscious the thinkers of modernity were in their attacks on tradition, the priority of life over everything else had acquired for them the status of a "self-evident truth," and as such it has survived even in our present world, which has begun already to leave the whole modern age behind and to substitute for a laboring society the society of jobholders. But while it is quite conceivable that the development following upon the discovery of the Archimedean point would have taken an altogether different direction if it had taken place seventeen hundred years earlier, when not life but the world was still the highest good of man, it by no means follows that we still live in a Christian world. For what matters today is not the immortality of life, but that life is the highest good. And while this assumption certainly is Christian in origin, it constitutes no more than an important attending circumstance for the Christian faith. Moreover, even if we disregard the details of Christian dogma and consider only the general mood of Christianity, which resides in the importance of faith, it is obvious that nothing could be more detrimental to this spirit than the spirit of distrust and suspicion of the modern age. Surely, Cartesian doubt has proved its efficiency nowhere more disastrously and irretrievably than in the realm of religious belief, where it was introduced by Pascal and Kierkegaard, the two greatest religious thinkers of modernity. (For what undermined the Christian faith was not the atheism of the eighteenth century or the materialism of the nineteenth—their arguments are frequently vulgar and, for the most part, easily refutable by traditional theology—but rather the doubting concern with salvation of genuinely religious men, in whose eyes the traditional Christian content and promise had become "absurd.")

Just as we do not know what would have happened if the Archimedean point had been discovered before the rise of Christianity, we are in no position to ascertain what the destiny of Christianity would have been if the great awakening of the Renaissance had not been interrupted by this event. Before Galileo, all paths still seemed to be open. If we think back to Leonardo, we may well imagine that a technical revolution would have overtaken the development of humanity in any case. This might well have led to flight, the realization of one of the oldest and most persistent

dreams of man, but it hardly would have led into the universe; it might well have brought about the unification of the earth, but it hardly would have brought about the transformation of matter into energy and the adventure into the microscopic universe. The only thing we can be sure of is that the coincidence of the reversal of doing and contemplating with the earlier reversal of life and world became the point of departure for the whole modern development. Only when the *vita activa* had lost its point of reference in the *vita contemplativa* could it become active life in the full sense of the word; and only because this active life remained bound to life as its only point of reference could life as such, the laboring metabolism of man with nature, become active and unfold its entire fertility.

45

THE VICTORY OF THE *Animal Laborans*

The victory of the *animal laborans* would never have been complete had not the process of secularization, the modern loss of faith inevitably arising from Cartesian doubt, deprived individual life of its immortality, or at least of the certainty of immortality. Individual life again became mortal, as mortal as it had been in antiquity, and the world was even less stable, less permanent, and hence less to be relied upon than it had been during the Christian era. Modern man, when he lost the certainty of a world to come, was thrown back upon himself and not upon this world; far from believing that the world might be potentially immortal, he was not even sure that it was real. And in so far as he was to assume that it was real in the uncritical and apparently unbothered optimism of a steadily progressing science, he had removed himself from the earth to a much more distant point than any Christian otherworldliness had ever removed him. Whatever the word "secular" is meant to signify in current usage, historically it cannot possibly be equated with worldliness; modern man at any rate did not gain this world when he lost the other world, and he did not gain life, strictly speaking, either; he was thrust back upon it, thrown into the closed inwardness of introspection, where the highest he could experience were the empty processes of reckoning of the mind, its play with itself. The only contents left were appetites and desires, the senseless

urges of his body which he mistook for passion and which he deemed to be "unreasonable" because he found he could not "reason," that is, not reckon with them. The only thing that could now be potentially immortal, as immortal as the body politic in antiquity and as individual life during the Middle Ages, was life itself, that is, the possibly everlasting life process of the species mankind.

We saw before that in the rise of society it was ultimately the life of the species which asserted itself. Theoretically, the turning point from the earlier modern age's insistence on the "egoistic" life of the individual to its later emphasis on "social" life and "socialized man" (Marx) came when Marx transformed the cruder notion of classical economy—that all men, in so far as they act at all, act for reasons of self-interest—into forces of interest which inform, move, and direct the classes of society, and through their conflicts direct society as a whole. Socialized mankind is that state of society where only one interest rules, and the subject of this interest is either classes or man-kind, but neither man nor men. The point is that now even the last trace of action in what men were doing, the motive implied in self-interest, disappeared. What was left was a "natural force," the force of the life process itself, to which all men and all human activities were equally submitted ("the thought process itself is a natural process")[86] and whose only aim, if it had an aim at all, was survival of the animal species man. None of the higher capacities of man was any longer necessary to connect individual life with the life of the species; individual life became part of the life process, and to labor, to assure the continuity of one's own life and the life of his family, was all that was needed. What was not needed, not necessitated by life's metabolism with nature, was either superfluous or could be justified only in terms of a peculiarity of human as distinguished from other animal life—so that Milton was considered to have written his *Paradise Lost* for the same reasons and out of similar urges that compel the silkworm to produce silk.

If we compare the modern world with that of the past, the loss of human experience involved in this development is extraordinarily striking. It is not only and not even primarily contemplation which

86. In a letter Marx wrote to Kugelmann in July, 1868.

has become an entirely meaningless experience. Thought itself, when it became "reckoning with consequences," became a function of the brain, with the result that electronic instruments are found to fulfil these functions much better than we ever could. Action was soon and still is almost exclusively understood in terms of making and fabricating, only that making, because of its worldliness and inherent indifference to life, was now regarded as but another form of laboring, a more complicated but not a more mysterious function of the life process.

Meanwhile, we have proved ingenious enough to find ways to ease the toil and trouble of living to the point where an elimination of laboring from the range of human activities can no longer be regarded as utopian. For even now, laboring is too lofty, too ambitious a word for what we are doing, or think we are doing, in the world we have come to live in. The last stage of the laboring society, the society of jobholders, demands of its members a sheer automatic functioning, as though individual life had actually been submerged in the over-all life process of the species and the only active decision still required of the individual were to let go, so to speak, to abandon his individuality, the still individually sensed pain and trouble of living, and acquiesce in a dazed, "tranquilized," functional type of behavior. The trouble with modern theories of behaviorism is not that they are wrong but that they could become true, that they actually are the best possible conceptualization of certain obvious trends in modern society. It is quite conceivable that the modern age—which began with such an unprecedented and promising outburst of human activity—may end in the deadliest, most sterile passivity history has ever known.

But there are other more serious danger signs that man may be willing and, indeed, is on the point of developing into that animal species from which, since Darwin, he imagines he has come. If, in concluding, we return once more to the discovery of the Archimedean point and apply it, as Kafka warned us not to do, to man himself and to what he is doing on this earth, it at once becomes manifest that all his activities, watched from a sufficiently removed vantage point in the universe, would appear not as activities of any kind but as processes, so that, as a scientist recently put it, modern motorization would appear like a process of biological mutation in

which human bodies gradually begin to be covered by shells of steel. For the watcher from the universe, this mutation would be no more or less mysterious than the mutation which now goes on before our eyes in those small living organisms which we fought with antibiotics and which mysteriously have developed new strains to resist us. How deep-rooted this usage of the Archimedean point against ourselves is can be seen in the very metaphors which dominate scientific thought today. The reason why scientists can tell us about the "life" in the atom—where apparently every particle is "free" to behave as it wants and the laws ruling these movements are the same statistical laws which, according to the social scientists, rule human behavior and make the multitude behave as it must, no matter how "free" the individual particle may appear to be in its choices—the reason, in other words, why the behavior of the infinitely small particle is not only similar in pattern to the planetary system as it appears to us but resembles the life and behavior patterns in human society is, of course, that we look and live in this society as though we were as far removed from our own human existence as we are from the infinitely small and the immensely large which, even if they could be perceived by the finest instruments, are too far away from us to be experienced.

Needless to say, this does not mean that modern man has lost his capacities or is on the point of losing them. No matter what sociology, psychology, and anthropology will tell us about the "social animal," men persist in making, fabricating, and building, although these faculties are more and more restricted to the abilities of the artist, so that the concomitant experiences of worldliness escape more and more the range of ordinary human experience.[87]

Similarly, the capacity for action, at least in the sense of the releasing of processes, is still with us, although it has become the exclusive prerogative of the scientists, who have enlarged the

87. This inherent worldliness of the artist is of course not changed if a "non-objective art" replaces the representation of things; to mistake this "non-objectivity" for subjectivity, where the artist feels called upon to "express himself," his subjective feelings, is the mark of charlatans, not of artists. The artist, whether painter or sculptor or poet or musician, produces worldly objects, and his reification has nothing in common with the highly questionable and, at any rate, wholly unartistic practice of expression. Expressionist art, but not abstract art, is a contradiction in terms.

realm of human affairs to the point of extinguishing the time-honored protective dividing line between nature and the human world. In view of such achievements, performed for centuries in the unseen quiet of the laboratories, it seems only proper that their deeds should eventually have turned out to have greater news value, to be of greater political significance, than the administrative and diplomatic doings of most so-called statesmen. It certainly is not without irony that those whom public opinion has persistently held to be the least practical and the least political members of society should have turned out to be the only ones left who still know how to act and how to act in concert. For their early organizations, which they founded in the seventeenth century for the conquest of nature and in which they developed their own moral standards and their own code of honor, have not only survived all vicissitudes of the modern age, but they have become one of the most potent power-generating groups in all history. But the action of the scientists, since it acts into nature from the standpoint of the universe and not into the web of human relationships, lacks the revelatory character of action as well as the ability to produce stories and become historical, which together form the very source from which meaningfulness springs into and illuminates human existence. In this existentially most important aspect, action, too, has become an experience for the privileged few, and these few who still know what it means to act may well be even fewer than the artists, their experience even rarer than the genuine experience of and love for the world.

Thought, finally—which we, following the premodern as well as the modern tradition, omitted from our reconsideration of the *vita activa*—is still possible, and no doubt actual, wherever men live under the conditions of political freedom. Unfortunately, and contrary to what is currently assumed about the proverbial ivory-tower independence of thinkers, no other human capacity is so vulnerable, and it is in fact far easier to act under conditions of tyranny than it is to think. As a living experience, thought has always been assumed, perhaps wrongly, to be known only to the few. It may not be presumptuous to believe that these few have not become fewer in our time. This may be irrelevant, or of restricted relevance, for the future of the world; it is not irrelevant

for the future of man. For if no other test but the experience of being active, no other measure but the extent of sheer activity were to be applied to the various activities within the *vita activa*, it might well be that thinking as such would surpass them all. Whoever has any experience in this matter will know how right Cato was when he said: *Numquam se plus agere quam nihil cum ageret, numquam minus solum esse quam cum solus esset*—"Never is he more active than when he does nothing, never is he less alone than when he is by himself."