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7

The Motor Cause and the Modern Mind

A SCIENCE MUST BE CAUSAL

Thinking, especially with a scientific rigor, would have no permanent address in an indeterminate universe. When a car is in neutral, it can be pushed and pulled in any direction and at any speed, and if the universe were equally indifferent, man could make of it what he wishes.

Without extrinsic causes, the world would be indeterminate, and all science would drown in the flux. If a motor cause were not needed for every motion, a moving thing could pop up out of nowhere at any time and any place. A similar spree of chance would unsteady a non-final universe, where moving things were not angled to given ends and hence could do any kind of maneuvering when set in motion.

A genuine science has both the courage and also the courtesy to weigh any objections against its statements, and the doctrine of causality, introduced in Chapter 3, bears a comparison with its substitutes. This chapter will sift the more important ideas on the motor causes of nature, while final causality will be the burden of Chapter 8.

Broadly, the present chapter falls into three parts: a glance at the notion of causes introduced by Hume; a survey of opinions that make cause and effect too extrinsic to each other, too intrinsic, or equal; and a summary of opinions that would counter-

act mechanism, like Hegelianism on the one hand and emergent evolutionism on the other.

The first of these three parts is subdivided into an outline of Hume, a rejection of him, a sketch of his applications in empiriological physics, and a brief discussion of Kant, who was Hume's descendant.

The second large theme will show first that a motor cause is not absolutely extrinsic to the effect, nor absolutely intrinsic, but moves its effect by contact, which is a medium position between the extremes. But this contact is not an identity, as the law of action and reaction would have it, and entropy does not resolve the dilemma to which scientism is forced by the spirit of Newton's third law. Only nature and only a distinction of action and passion can account for innovation.

The final broad division of this chapter will discuss Hegel, Marxism, and emergent evolutionism, and show at last that dualism accounts for the truth in both modern dynamism and modern inertialism.

HUME VIEWED CAUSALITY AS SUCCESSION

Causality has been one of the big battlefields of modern thought. If empiriological physics as a science still survives the denial of motor causality, it is only because the haze of the battle has not yet cleared enough to let the corpses be counted. Hume rejected a motor cause as really influencing an effect and affirmed instead a causality that is simply temporal succession. One thing follows another as the light goes on after the throwing of a switch. But the switching is simply prior to the lighting, Hume would say; it does not influence it.

So far this idea to a mind meeting it for the first time seems as wrong as, in genuine science, it is naive. But it is a conclusion, rather than a starting point in Hume's philosophy, which is as a whole more critical than positive in nature and has won the plaudits of modern sensate man. Hume came upon the world through Cartesianism. In him was fulfilled the seed of skepticism

which Descartes had planted and especially a denial of all natures and substances which are stabilities in the real world and the anchors of our certitude about it.

Instead of interacting natures and substances, the Humean world is speckled only by phenomena, appearances, brute sense data. Instead of grasping causes by intelligence, Hume stubbornly refused to go beyond sensations and took the simple successions of things which the senses present as the farthest fling of human knowledge.

In psychology, having fastened upon his universal denial of substance, Hume reduced mind to a series of mental states, not united intrinsically to each other but merely heaped together like flakes in a snow drift. According to Hume, the recurrence of a sequence like the moistening of the earth during a rain generates a mental association, or in a more modern terminology, grooves a reflex, which leads man to expect a moistening of the earth after the rainfalls in the future. But men are not aware, Hume goes on, that the rigor they ascribe to causality is only this rut in the mind. They dupe themselves into thinking that the rain causes the moistening whereas in reality, according to Hume, the two events have nothing more than a temporal regularity which our habits of association misread into a causal interplay. According to Humean views, the alarm clock would not awaken man in the morning; it goes off at one moment, and uninfluenced by it, man gets up in the next.

Hume's ideas are continued in John Stuart Mill, and the reader may verify the fact by a glance at Mill's canons of induction, especially the method of concomitant variations.

HUME CONTRADICTS REASON

But if causality is nothing but temporal sequence which leads the mind to associate two states so that the second member of the sequence will always be expected whenever the first occurs, man ought to say that every example of succession is causal. In point of fact, man does not say so or think so or act as if Hume were

right. Shine a flashlight in a man's eye, in an example from Whitehead, and the man will not say that his blinking merely followed the light. He knows that the light made him blink. Thomas Reid refuted Hume with his classic example that night follows day and day the night, but no one says that one is the cause of the other. If Hume were right, this conclusion ought to have been reached and reached long ago since nothing is more regular and rutlike in the sense world than this procession of day and night.

Reason does not agree with Chanticleer that his crowing causes the sunrise. Why do men say that the engine pulls the caboose rather than the caboose pushes the engine? Because they clearly distinguish between successions that are merely temporal and those which are causal. By intelligence, they are able to examine the motions of nature, defining them and tracing out their relations until, with self-motion impossible, a mover is known to operate and to exist whenever and wherever motion occurs. Deny the power of intelligence and Hume is *almost* right—almost, it should be stressed, for the skepticism which follows upon the denial of intelligence would not allow a man to expound a philosophy, as Hume has done, and to discover and discuss such things as succession and association which are known by intelligence.

Hume's idea finds a counterpart in the modern reduction of causality to a functional relationship, under the powerful dynasty of Newton and Leibniz, fathers of the calculus. Functionality exists where one thing varies as another thing varies without the necessity of a causal intercourse between them (Chapter 1). That in less precise form is what Hume said two centuries ago and what Mill says in his method of concomitant variations.

But though valid at the empiriological level, functionality does not substitute for the necessity of causal knowledge. If functionality were adequate to a truly scientific system, one could say, to use Russell's language (though not his philosophy), "The barometer has ceased to have any effect upon the weather." For the barometer varies when the weather varies, and since barometric fluctuations forecast the weather and hence precede it, Hume, if

not sheer functionality, ought to compel us to say that the barometer is the cause of the subsequent weather rather than just an index of what it will be.

EMPIRIOLOGICAL PHYSICS FINDS A PLACE FOR HUME

There is of course, something to be said for Hume in the territory of empiriological physics which, in its pure form, cannot mount outside the sense world and is descriptive, rather than causal and explanatory, in nature. Einstein, who admits the influence of Hume, purified empiriological physics in accordance with Hume's counsel.

The use of functions to express law in empiriological physics shows that Hume, if a dwarf in genuine philosophy, was a goad to the maturing empiriological methods.

Empiriological physics is more loyal to itself by ignoring causes. Causality is not measurable, and when the empiriological extremist denies true causality, it is to be remembered that he is less prejudiced against causes than obsessed by measurement which alone has meaning in his precinct. For empiriological physics, causality obtains where events can be predicted in time, an analogue of Hume's doctrine on expectation. What is predictable is causal, for the empiriologist, and what is causal is predictable. This is not true causality, however adequate it may be in a merely descriptive enterprise.

True causality implies a break between cause and effect; the two are not identical because the effect is distinct from the cause. The hiatus puts causality in its genuine sense beyond the pale of empiriological physics which prospers best on a subject matter that is a continuum (and is treated by continuous functions).

For empiriological physics, then, the temporal continuum is fruitful as a substitute for causality since it eliminates the breaks in being, the hierarchies, natures, interiorities, and originalities in the objective world which experiment can neither detect nor manipulate. Hence, Hume was a stimulus to sheer empiriological physics by mooring it to "the observable," by furthering its views

of the world as continuous, and by emphasizing the successive continuum which is time. But his skeptical sensism, if allowed to carry weight outside of the purest empiriological method, would break the back of all thinking.

KANT MADE CAUSALITY AN APRIORISM

Another rather unhappy warrior against the traditional notion of motor causality was Kant. In many respects, his notion of a cause is simply a plagiarism of Hume's. Where Hume reduced the causal relation to mere succession, so did Kant. Where Hume shrank the idea of cause to the association of mental states, Kant painted it as an *a priori* category. The chief difference between the two is that Hume held the association of so-called causal events to be a product of habit, while Kant, rejoining Leibniz, enthroned the idea of cause as *a priori*, hence innate.

As in the case of Hume, the burden of refuting Kant belongs to the metaphysics of knowledge. But though fatally inadequate in philosophy, Kant, an empiriological physicist himself, paved the way, as Hume did, for the greater purity in empiriological methods. Such consciousness of itself has given empiriological physics a mastery over matter in proportion as it has retreated from the realities that can be probed and proved only in a speculative science of nature.

But Kant had the effect of saying that because the empiriological physicist cannot recognize causality, therefore causality cannot be recognized at all. It is as though a carpenter should decide that there are no other tools but his own type. Kant thus seared into the modern mind the impression that ontological realities are simply anthropomorphisms, projected by man's mind, and that the real world is that of the empiriological disciplines. He helped to isolate empiriological from philosophical physics, but he inflated the first into a true science and deflated the second so that it could not survive.

From at least one viewpoint, there is today a general alarm in the empiriological physics that tried to get along on Humean and

Kantian premises, turning them into a philosophy. Quantum mechanics has urged upon the empiriological physicist that there is no such thing as the determined regularity and sequence in nature which Hume and Kant took blissfully for granted; the uncertainty principle declares that the universe is not ordered but random, if many of its interpreters are to be believed. Relativity theory, by denying that absolute motion and absolute time and absolute space can be detected and by suggesting reversibility in the temporal order, would likewise have to challenge the dogma of Hume and Kant.

But it is a matter of historical fact that Hume and Kant removed causality from philosophy and persuaded scientism to confine itself to a purely descriptive analysis of temporal order instead of searching after causes.

A CAUSE IS NOT ABSOLUTELY EXTRINSIC

Hume shades off into another problem. Motor causality implies a contact between the mover and the moved. It also requires a relation between them that is not simply equalitarian. A discussion of these two principles will lead into a more precise knowledge of what a mover is and does. It will show how philosophical—not empiriological—physics yields the only true science of motion.

By definition, the Humean notion of a cause denies a causal influx into the effect while sound reason affirms it. Now if Hume is right and if the parade of events is simply a matter of serial order with no causal interlocks, every moment gives birth to events that are rankly spontaneous and irrelational. If posterior events are undetermined from the causal viewpoint, then every event is a creature of chance and even an order in time would be impossible. Uncaused by a prior reality, every event would simply burst out of nothingness in an unpredictable fashion, self-caused and self-moved and abandoned to itself.

Forced to its logical doom, the Humean philosophy which wants only prediction out of empiriological physics melts away

the axis of predictability by constructing a universe where all is self-motion and chance, hence unpredictable. The indeterminists in the empiriological physics of today have realized this philosophical conclusion in the concrete. All thinking would suffocate if there were no other atmosphere than this.

A realistic analysis of motion (Chapter 3) has shown that self-motion is impossible. In the foregoing remarks, there is a kind of confirmatory argument for this truth in the fact that the radical self-motion, a way of defining chance and the logical exodus of Humeanism, would devastate all thinking about the material world by reducing that world to an utter disorder. Somehow, the modern mind in its acceptance of Hume has been holding a candle that turns out to be a firecracker, and the explosions are beginning to be heard. If this self-motion, the issue of Hume's thought, is impossible because it would deny order and plow the world into chaos, there is additional proof that whatever is moved is moved by another. Order requires it, and order exists.

The cause exerts an influence upon the effect, and influx which means an inflow ought to be taken in a stricter sense than is sometimes accorded it. Self-motion having been rejected by the rigor of traditional scientific reasoning and by the absurdities of following Hume, there must be an outside motor for every movement and something more than an extrinsic juxtaposition between them. To put it crudely, it is not enough for a mover merely to touch the surface of the mobile, as though a tree could be felled by tapping its bark or as though a piano key would move downward by a light touch rather than by pressure. Such a picture of causality would be one of juxtaposition, and the Humean impasse shows that juxtaposition is not enough.

Motion implies a type of inner penetration by the motor into its subject. The whole mobile being, rather than merely its outer skin, is set in motion by the motor cause which must somehow spill over into the inner reality of what it moves.

This does not mean, of course, that motion involves physical compenetration, the presence of two bodies in the same place

(Chapter 12). What it does mean is that there is something more than a mere extrinsic presence of a motor when a thing is moved. The motor contributes something to the effect. There is thus ruled out the famous Leibnizian view that *A*, a mover, and *B*, the mobile, act without an interflow and by the preestablished harmony of the universe. Much more realistic was Aquinas when he wrote: "The mover and the mobile are together" (*Motus et movens sunt simul*). Leibniz, like Hume, would make *A* extrinsic to *B*, for his monadic units of the world have no windows or doors and not even keyholes to relate them to each other. His philosophy, like that of Hume, leads to functionality rather than causality as an approach to nature. Leibniz' view denies the originality of creatures and prompts a pantheistic view of the universe.

A CAUSE IS NOT ABSOLUTELY INTRINSIC

So far, it has been said that the mover contributes something intrinsically to the mobile rather than stands off, extrinsically, to witness a motion that it did not produce. But this view raises a question about the other extreme: Does the motor contribute something of its own being to the effect, imparting an electron for instance, if it is an atom moving through a positive field, or a photon if it is a source of radiation?

In this context, there arises another key figure in modern thought, Descartes, and his curious doctrine of cosmic change. For Descartes, local motion is the sole kind of movement in the universe, and such motion together with quantity which is taken as the essence of matter forms the only real dualism in the Cartesian system of physics. When modern empiriological physics explains the smashing of atoms by the motion of its component parts (quantities) to other regions of the universe and when Einstein reduces matter to mere space-time (quantity-local movement), there is evidence that Descartes is not dead, but, like Hume, more alive than ever. Whitehead also makes the cause too intrinsic to the effect in his "causal efficacy."

Nothing really occurs in the universe, Cartesian physics says,

except rearrangements, so that motion becomes not the product of a motor outside the mobile but a merely physical transfer of parts. When motion is completed, the part of the mover that accomplished the motion is physically inside the thing moved.

Though differing in temperament, Descartes and Hume are very much alike in their outlook on nature, and their linkage affords a deeper view of the empiriological mentality, especially how it parts company with philosophy. Where Descartes reduced structure to quantity, Hume saw only phenomena. And quantity and phenomena, taken alone, mean basically the same thing—an indeterminate and featureless universe with neither substance nor causes. Cartesian physics denied final causality, as the next chapter will show, and Hume carried on by rejecting even motor causes.

If all cosmic motion is of the local type, a shift of position rather than an affecting of things, there is no relation between mover and moved like that which experience and reason demand. In Cartesianism, the motor would not be outside the mobile as an extrinsic cause. A physical change like those, for example, in a radioactive series would be simply a migration of particles from the nucleus. Radium, when it emits an alpha particle, becomes radon.

But is an ejection of such a particle the cause or effect of the radioactivity? Empiriological physics equates cause and effect and calls their whole pattern of action spontaneous. Moved and mover become physically the same thing. There is a preference for the chance universe which Hume's system also inspires. The actual transfer of parts as an account of motion, where moved and mover are the same, turns nature into a chaos of self-moving and hence utterly spontaneous things. Such a view cannot differentiate between cause and effect. It must reduce empiriological physics, in its strict sense, to the problem of describing successions, which is exactly what Hume would want it to be. The meanings of Descartes, the rationalist, and Hume, the sensist,

meet in the contemporary view of nature and have been married after several centuries of courtship.

The physical identity of the motor and the mobile which Cartesianism ultimately requires is as mistaken as their physical isolation from each other which Humean premises suggest. One makes the mover too extrinsic, and the other too intrinsic, with respect to the moved. If they eventually intersect, where extremes meet, it is only because true causality alone can account for order, and without such a causality the world plunges into a chaos, a self-moving and chance universe which is the issue of Hume and Descartes alike.

CAUSES MOVE BY CONTACT

From what has thus far been said on the relation of the mover to the moved, the following conclusion can be authorized; the mover and moved can neither be absolutely distant or absolutely identified with each other. There is a middle course which is called movement by contact. Moved and mover are together but not the same, different but not distant. Motion requires an extrinsic mover, but this mover, because it affects the thing moved, must somehow be united with it without that physical transfer of itself that Descartes' physics demands. The motor must remain itself, extrinsic to the moving thing, even during the motion which it is causing. The agent does not destroy itself by acting; the patient does not absorb the agent, like a sponge taking in water. The agent remains even after the process, and as the next chapter will argue, it exists even more fully and perfectly in this aftertime than if it had not acted.

Though the realistic mean, of movement by contact, can be guaranteed by the rejection of the two extremes, a positive analogy might be helpful. The point at issue can be illustrated by the nature of knowledge which is not something preternatural in the universe but the highest form of action. Knowledge cannot change the subject, like food that is digested or like acid poured

on a metal. It involves that the subject, remaining itself, become the object in that intentional way which psychology more fully depicts. Knowledge, be it repeated, is simply the highest type of action, and the becoming of other as other which it implies is weakly whispered even on the inorganic level since action, like being, is not equivocal. There is of course a great danger of forcing the analogy too far. But somehow it does serve to suggest that the motor and the moving thing can, in a sense, be one and together without the absurdities of the Cartesian and Humean universe of modern thought.

The Neoplatonic idea of emanation yields another analogy that helps to hint at the important unity between mover and moved. Motor causality is a communication of form, where the agent, without destroying itself, confers something of its own inner being upon the subject moved. This is the only way in which the gain of a new form can be explained, if the mobile reality cannot account for its own form by moving itself. The poet leaves something of himself in his poetry. A good leader impresses something of his own mettle upon his subordinates. Floods leave their watermarks, and forest fires their trail of destruction. The motor communicates something to the moved. It is one with it, moving every part of it that moves and somehow showing that it penetrates to interiority in the effect.

The philosophical science of nature must leave the further development of this subject to the science of being which shows how an effect can participate in its cause without being physically and Cartesianly identified with it. In the metaphysical account, immanence and transcendence, the intrinsic penetration of an effect by a cause that yet remains extrinsic to it are reconciled in a way that leads to neither pluralism nor monism.

EMPIRIOLOGICAL PHYSICS EQUATES CAUSE AND EFFECT

Motion has two poles which have forced philosophy to distinguish between action and passion and have given rise to delicate problems in both traditional and modern thought. What the

agent does is characterized by Aristotle as action. It is a kind of making, a doing of something to something else. The yielding in the subject acted upon is called passion or patience, which both indicate passivity and reception. Passion is the receipt of something from something else.

But if the motor and moved are one, how can action and passion be called different? So impressed with this intimacy between the agent and patient, Suarez held that action is formally in the patient. But this would tend to deny the extrinsic character of the extrinsic cause and lead to a mobile universe of self-motion. It is realism to affirm with Aristotle and Aquinas that action is in the agent and passion is in the patient but that they somehow communicate in the unity of motion—a dim analogy to the unity between subject and object in knowledge. Proof of all this can be made even more pointed if it is prefaced by the empiriological solution of the problem which emphasizes even more the need for the answer of Aristotle.

In a wide way, action and passion in their traditional meanings are mated by the pair, action and reaction, in the modern empiriological vocabulary. A more minute account of this parallelism would have to show that reaction, in its Aristotelian sense, is not the same as passion but involves a type of rebound from the patient into the original agent itself, with the patient being itself an agent when actualized. An axe that cuts is also dulled in the process. The modern view puts the reaction into the effect and makes it akin to what Aristotle meant by passion. In the following broad discussion, passion and reaction can temporarily be taken as the same, and reaction, in its Aristotelian sense, will be by-passed. Action will mean what happens in the cause and passion or reaction what happens in the effect. For after showing that the cause is neither completely transcendent to the effect as Humeanism would say or completely immanent as Cartesian physics says, the following discussion will use a more empiriological backdrop to show that they are not equal.

The equivalence of action and reaction was stated actually by

Galileo (in his parallelogram law) and formulated by Newton into one of his three principles that classical physics turned into its charter. Action and reaction are equal, says the Galilean-Newtonian methodology, where equality is taken of course in its mathematical sense. Ernst Mach brings out the full force of this equivalence:

A body that presses or pulls another body is, according to Newton, pressed or pulled in exactly the same degree by that other body. Pressure and counter-pressure, force and counter-force, are always equal to each other.¹

The law of equivalence here can be described as the principle of conservation of momentum.

This equating of action and reaction is perhaps the central peak of seventeenth-century method from which the whole of modern empiriological physics has descended. When Newton was abandoned, his basic principle remained as the aim of empiriological research and as the norm for deciding when a statement is meaningful. What acts and what reacts and the manner of measuring each, true enough, no longer loom the same today as on the horizons of Galileo and Newton. But relativity and quantum mechanics are still bent on equating things, with all else deemed indeterminate and unmeaning. Equalities or equations form the only language that the strict empiriological physicist will bother to learn.

In the effect, Newton's third law amplifies his first one, which is the well-known law of inertia. Conveyed to its ultimate destiny, this law, as these pages have frequently inferred, requires empiriological method to view all reality as completely determined from the outside. It implies the equivalence of cause and effect which the law of action and reaction simply files into pointed form.

It has already been shown in the discussion of Descartes and Hume that the modern idea of cause tends to equate mover and

¹ *The Science of Mechanics*, 3d ed. (Chicago, 1902), p. 199.

moved and to make for a world of self-motion. Descartes' quantitative world easily submits to the mathematics of equality. Hume's world is the continuum. Alexander, in the progeny of Hume, could write: "Causality is thus the relation of continuity between one substance and another . . ."² This notion of continuity, drawn from Hume, means identity or equivalence and rejoins the Cartesian effort. Descartes and Hume plowed the philosophical soil that modern empiriological physics has planted.

THE CAUSE-EFFECT EQUATION FAILS TO EXPLAIN NOVELTY

The equivalence of action and reaction is loaded with vast problems that empiriological physics must pass unanswered or, if they are to be faced at all, appeal for their solutions to the philosophical science of nature. If this equivalence holds, then how can there be any motion at all? The Galilean-Newtonian equivalence, which empiriological physics still adopts as the test of meaning and determinacy, implies the well-known case of an irresistible force meeting up with an immovable object. From such a clash, no motion could result.

Suppose a horse were attempting to pull a wagon up a hill (action) but that the opposing forces (reaction) were just sufficient to balance out the pull on the horse. The wagon and the horse would never move.

This is of course, a familiar freshman difficulty, and empiriological physics answers it by holding that the reaction is the motion. But this is really not an answer. For if the motion, as a reaction, is equated to the motor forces, there is no difference between them, and without that element of difference, the mover is the same as the moved; no effect has occurred at all. On the premises of empiriological physics which denies everything but quantity and local motion, this ought to be a static universe, with empiriological method prospering in the logical order only by ignoring the data of experience which discloses cosmic motion

² *Space, Time, and Deity*, I, 281.

at every turn. There is no true hierarchy in formal logic and there is none on the flatlands of empiriological methods.

Another way of expressing that important fact of difference between the motor and the moved, a difference that the law of action and reaction sweeps to equivalence, is the element of novelty which motions breeds. Motion delivers to the universe something more than was there before. There is no static tug of war between the acting and reacting things of experience. As Aquinas says, "every new reality needs an innovating principle." There is progress in nature, states that characterize its today that were not in existence yesterday.

This element of novelty cannot be wholly explained by equating action and reaction or by equating anything else. The propulsive forces in nature, what Boodin calls the plus factors, somehow win out over the contrary powers which tend to cancel them. In human life, for instance, if each man gave back to the world only what he got out of it, there would be no progress in philosophy, science, politics, economics, industry, farming, in fact, in the whole of individual and social life. Progress depends on man's giving to the world more than he finds when he comes into it. If an incipient mover in nature were immediately stalemated by forces opposing it, nothing would ever occur. There is something more in nature than a mere mathematical balance.

ENTROPY FAILS TO EXPLAIN CAUSATION

Empiriological physics, of course, would attempt to explain motion as the result of entropy, pounding the universe on to death by tending to balance kinetic and potential energies or, more precisely, by a slow exhaustion of usable energy: some day the temperature of the universe will be so uniform, its motions so balanced among themselves, that the thermal equality of all bodies and hence their motions would forbid further exchange of energy.

The inadequacies of this law, as a philosophical conclusion, will be examined in the following chapter on finality and chance.

But for present purposes, it may simply be stated that if all bodies are subject to the law of entropy and there are no canceling antientropic forces even in the mineral world, the equalization of energies and the cessation of motion should be accomplished with an infinite speed and in an instant.

Entropy still leaves the novel element in experience unaccounted for. It leaves unrepealed the law of action and reaction by which the constant and finite character of energy is established and entropy is made meaningful. For entropy would have no meaning in an infinite universe or, if the supply of energy in the world were not constant but augmented by new creations.

Entropy alone would imply the downhill infinity of the universe, but the infinity of the universe would imply the unmeaning of entropy. So with entropy ruled out as a means of explaining the fertility of matter and with the law of action and reaction ruled in as basic to the idea of entropy at the empiriological level, the element of novelty in motion still remains empiriologically unexplained and on empiriological premises even impossible.

Because the universe is in constant motion, it is moving unceasingly from a potential to an actual state. There is a hierarchy between potency and act which cannot be explained by an equality sign and becomes in fact a focal point for showing that action and passion are really different. A pile of potencies is no more actual than the weakest of them. There must be more to act than there is to potency in order to avoid the embarrassment of the equational universe of empiriological physics and to account for the fact that there is something new in the universe today that yesterday was not here.

NATURE IS AN INNOVATING PRINCIPLE

To understand all this, it is imperative to return to the concept of nature which is the only subject of philosophical physics. Nature is an intrinsic source and principle in things, unexplained by, because unequated to, the transeunt forces and inertial factors acting from without. Every nature bears something original

within its bosom. As a source and principle, it is a kind of spontaneity; it is fertile, as the original etymological notion of nature even suggests. It is not a featureless puff of inertia. Aquinas, it may be repeated, referred to any nature as a prime mover, and it is nature, as a source and principle rather than as a hollow inertia, that again melts away the icy formalism of empiriological physics and illuminates experience like the sun.

Nature spills out over the constraining forces that would dam it up. Movement is not the result of equality but of the originality of the nature that moves and the nature that is moved. Truly enough, a nature acts when acted upon and only to that extent. Its motions all trace their origins to an absolute Prime Mover. But when it acts, in that chain of movers where it is a link, it acts in an original way. It is an inner principle of original tendencies. Spontaneity that it is, it explains why motion is not forever fettered by cancelling forces and why reactions in matter are different from the actions which touch them off. It requires a discussion of final causality to round out this science of cosmic reaction. Hence the present theme must be interrupted until the following chapter.

This outline has established the difference between mover and moved, action and, in the wide sense, passion, action and reaction, cause and effect. Movement always involves a spontaneity, or it would be stopped by the veto of an equalitarian universe. Things that are moved transform the motion that they receive before passing it along to another recipient, and they thus give the transmitted motion something of their own originality. They do not simply pipe on a mathematical equivalence. Form is a principle of motion. If this principle were itself only pure motion, the motion which it imparts would not bear its own specific seal but would be general or indifferenced, the continuum of Heraclitus and Hume and Descartes. The recipient also received according to its own mode of being, as salt and pepper present different colors when illuminated by the same light.

Making a distinction between action and passion, action and

reaction, can be cast into the general difference between what a thing has from within itself and what it has from the outside. Both internal and external causal influences are at work in mobile beings. But in their relations to each other the intrinsic does not explain the extrinsic, for in that case matter would be perfectly immanent. Neither does the extrinsic explain the intrinsic for in that case matter would be perfectly passive and wholly plural. In the middle lies the dualism of differentiating cause and effect.

ACTION IS DIFFERENT FROM PASSION

Moreover, action and passion involve a difference in directionality within a movement. Action is an initiative, while passion is first and, in the strict philosophical sense, a receipt. And reaction, in the proper sense, is owed to the initiative of the receiver as an agent with its own nature. Action and passion are opposed like selling and buying, teaching and learning. Giving is not just a special kind of getting in the material world. Resistance is not the same as yielding.

Equating action and reaction or even action and passion would beckon on the self-moving universe of Descartes and Hume. If mover and moved were the same, self-motion and chance would ground our world.

If action and reaction (passion) were equal, then every nature could act on its own self. But nature is the cause and source of actions, not their end. Progress requires that things tend outside themselves. The equivalence of action and passion, of the extrinsic and the intrinsic, would yield complete self-motion where the end and agent are identified and where chance and degeneration would replace the progressive grounds of a universe that is progressing in fact.

Man of course can think about himself and determine himself. By this total reflection and by freedom, he makes himself in some way the subject and object, agent and patient of his own actions, weakly imitating that complete immanence which is found only in God. But the world below man progressively falls away from

this apex of immanence because the cleavage between action and passion becomes proportionately greater from man downward.

Furthermore, in the efficient order, the cause is always greater than the effect, though progress is made possible by final causality as the next chapter will show. Action is thus always higher than passion, at the level of motor causality. Otherwise, the greater would come from the less; or, in the event that action and passion were identified, there would be no sufficient reason why anything at all should follow from their union.

Motion cannot be the result of the mere algebraic sum of forces from without. If these forces are constant, they would tend to be indifferent to motion rather than to produce it, since the moved thing would give back exactly what it received. There would be an irresistible force versus an immovable object. The moving hand could never even write, let alone having writ, move on.

HEGEL DOES NOT LEAD TO TRUE HIERARCHY

There have been and there still are very definite reactions against the equalitarian account of motion which would really strangle the universe into a standstill.

The most striking example of this attempt to reconstruct a hierarchy of being is found in Hegel, who had the dubious honor of going astray on his fundamental principle but reasoning with a most acute logic thereafter. Hegel parted company with the algebraic constructions of Descartes and Kant by insisting that the universe is pure becoming. In this respect, a new Heraclitus was arising to oppose Parmenides, reborn into the static flesh of the empiriological enterprise. Though extremely critical of Heraclitus, Aristotle stood more with him in his *Physics* than he did with Parmenides and Plato. Hence, Hegelianism, with its emphasis on process, was a healthy thing by way of reaction toward a moderate and dualistic dynamism like that of Aristotle. But it lost its health by catching the same fatal germs that Aristotle

diagnosed in Heraclitus. Hegel not only saw process in the world; he saw nothing else.

To explain the dynamism of the universe, Hegel introduced the so-called dialectical triad. Whatever exists (thesis) calls its opposite into being (antithesis), and from the star-crossed tension between these foes, a third and higher thing is born (synthesis) which includes both of its elements by transcending them. If there is slavery in the social order, for instance, there must be a master; for otherwise slavery would be unmeaning. From the friction between these two classes, there arises a new man bearing something of the master and something of the slave within him but surpassing both in his higher unity. This famous master-slave dialectic is only one example of the fundamental mold of all cosmic process. There is a growth and a progress and a fertility about the Hegelian universe which is choked off by the equalitarian premises of empiriological physics.

But the price of progress in the Hegelian scheme is too great for realism to pay. It is pegged by denying the principle of non-contradiction. Instead of discerning the truth that a thing excludes its opposite, Hegel declared that a thing implied it. Instead of accepting the principle of non-contradiction which he had to use in order to think and to write, Hegel rejected it, equating being and non-being in a way that is even more serious than the empiriological equation of cause and effect. Though aware that a mere inertialism could not explain the real, Hegel affirmed that a thing is wholly determined from within and from without simultaneously—another concerto on the meeting of contradictions.

Yet there is a fertility about the universe that may be salvaged from the broader meanings of Hegel, and this mobility stands in contrast to the static death which scientism portrays. Hegel did not equate the effect, the synthesis, with the causes conspiring to produce it. Like Aristotle, he was aware that the effect is no mere mechanical sum of its causal elements. But Aristotle would ve-

hemently disagree with the character of the opposition that Hegel sees in matter. He would say that the basic principles of motion are not contradictories but contraries and that action and passion, which analogate in the accidental order of operation, the matter-form dualism in the order of substance, are likewise contrary rather than contradictory in character.

MARXIAN DYNAMISM IS IMPOSSIBLE

Marx and Engels took over the dialectical method of Hegel and poured material cement into its molds. They felt that the Hegelian contradictories, as principles of nature, enabled them to do away with the need for an extrinsic Prime Mover.

Hegel had always insisted on the Absolute. It exteriorized itself to start cosmic motion, he said, and the same motion is but a mirror of the tendencies in mobile beings to return to this Absolute as their ends. Hegel had inherited through Fichte the pantheistic view of nature which Spinoza had proposed, and far from accepting the purposeless, mechanical, and deistic universe which the scientism of his time was constructing, he went to the other extreme of absorbing the world into God.

This theocentric orientation of Hegelianism Marx and Engels flatly rejected. In accepting the dialectic of contradictories, they could, they felt, explain motion without recourse to a Prime Mover. Motion, they presumed, was the explosion of matter, set off by the inner tensions of its contradictory structures. It was viewed as lightning which results when two clouds collide or as the dynamism in a magnet because of its positive and negative poles. Obsessed likewise with the meeting of opposites, Lenin called the principle of identity, *A is A*, "an intolerable vacuity."

Matter according to Communism is self-moved and hence self-explanatory.

Marx and Engels were not deep enough to discern that a thing which contradicted itself would result not in a mobile universe but would be precisely "an intolerable vacuity." Contradictories like a circle that is not a circle, a rose that is not a rose, an elec-

tron that is not an electron do not fertilize the universe by an intrinsic cross-pollination. They simply cancel each other out, leaving the zero of a vacuum rather than a moving world.

The Marxist arguments that matter is constituted of two contradictory principles turn out to be spurious when they are reasoned out. There is opposition in the universe truly enough. But one thing does not contain its contradictory at the same time as it is what it is. The opposition, which the Marxians emphasize, comes from outside the thing in question, like floor boards resisting weight or like contrary winds blowing into the sails. Negative electric particles are outside the positive ones; the two charges do not contain each other.

The Marxian oppositions in matter would tend to balance out each other, as in the equational universe of strict empiriological physics. The oppositions would not promote motion but rest and even vacuity.

EMERGENT EVOLUTION DENIES CAUSE-EFFECT EQUALITY

Another view of nature which in a way repeats scientism and in a way forsakes it is the emergent evolutionism of men like Santayana, Alexander, Whitehead, Bergson, Lloyd Morgan, MacDougall, Smuts, and Sellars. These men, despite differences of intellectual temperament and philosophical premises, all agree in rejecting the mechanical profile of matter and in holding to the spontaneous and even chancelike character of its development. They tend, overtly or not, to vitalize matter as in the case of Bergson's vital elan which affects not only organisms but the entire universe. They view the production of novelty as one of matter's essential characteristics that does not require further explanation. What is called chance is, in general, not a rarity but the law or rather lawlessness that matter follows.

Motion thus becomes unpredictable. It is uncaused by extrinsic agencies and is but the natural outbreak of matter itself. Pressed to explain what moves matter to act in the way it does, the typical emergent evolutionist would answer that it is matter

itself. Such is its nature. Matter requires no extrinsic mover. This is counter to orthodox empiriological physics and to strict empiriological method. But in a way, it is ultraempiriological since it forces the Cartesian and Humean premises until the self-motion of matter, already deduced in theory, is actually wrung out of them.

Emergent evolutionism is also accepted more or less by contemporary naturalism, floating today largely on the current which Dewey has stirred and accepting as gospel truth the fact of a thoroughgoing cosmic evolution. Such a group speaks of an "organic imbalance," produced by the developing tensions in matter, and naturalism as a philosophy is designed principally to help man counteract that disturbance by getting into stride with his environment. The naturalists of today adopt a dynamism wholly at variance with the empiriological method which they otherwise claim as the sole tool of knowledge and which in fact decrees not a moving but a static world.

Emergent evolutionism—and the phases of naturalism which imply it—requires the impossible premise of self-motion and stands condemned before the bar of reason for thus making matter potential and non-potential, actual and not-actual, under the same aspect. Most of its adherents are loose thinkers, drenched with Darwinism, prone to mistake mere theory for settled fact, misty with a sentimental faith about the dignity and future of man, and inclined to settle for descriptions of the world rather than causal inquests. The principle of non-contradiction which they apply in thinking, writing, living, and teaching they fail to recognize as perishing in their philosophies of self-motion.

DUALISM HARMONIZES MODERN OPPOSITIONS

But with all the criticism leveled at strict empiricism, when it poses as philosophy, and at emergent evolutionism, which exalts chance, there is something to be said for both of them. They lie at the extreme ends of a spectrum whose only full and reasonable light is in the brightness at the center. Philosophers, biased to-

ward the empiriological method, are right in their insistence that the cause determines the effect, the motor the moved, the agent the patient, but they make this determination so complete that cause and effect become synonyms. Emergent evolutionism is right in its thick accent on the spontaneity of nature and on the inequalities in motion that make for a universe, prospering and progressive. The error lies in twisting motion so far out of the equalitarian forms of classical determinism that the universe buckles into the self-motion of chance.

The full report on reality lies between these views with nature seen as an interior principle, and hence emerging source, while at the same time moved only by extrinsic agents and only as long as these agents act. Realism can live again in philosophy only when and if men, forsaking the limits of sensation which grasps only one thing at a time, recognize their intelligence which they use in practice to deny itself in theory. Until then, philosophy will oscillate between the extremisms that only a dualistic science can reconcile by transcending.

Motion is in many ways the leading problem in contemporary philosophy. Empiriological method tends to ignore it, and the philosophies of emergence incline to deny that there is anything else. Heraclitus is once again at odds with Parmenides, and a rethinking of Aristotle would help men to arbitrate the dispute.

Now as in the time of Aristotle and whenever there is motion, form and matter are its principles, and their union requires an extrinsic motor which is called an efficient cause.

Suggested Readings

de Finance, Joseph, *Être et agir* (Paris, 1945).
Garrigou-Lagrange, Reginald, *God, His Existence and Nature*, transl. B. Rose (London, 1934), Vol. I.