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THE SCIENCE OF BODIES

and

THE APPEAL TO SOMEBODY

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THE SCIENCE OF BODIES AND THE APPEAL TO SOMEBODY.

1. PRIMARY AND SECONDARY LIFE.

Physics is losing its centennial rank in the hierarchy of our scientific universe. Physics ceases to be the spearhead of the marching army of thought. It will, of course, continue to work and to function. But it will not revolutionize the man who is not a physicist. The last three centuries had one main 'Leitmotiv', one melody: mechanics and that meant: physics. Now, we hear the swelling of a new melody. And physics, although still with us, is denied its primary place by the physicists themselves. They hasten to disclaim any special leadership among all of us. This is the achievement of Albert Einstein. He removes his own science to a secondary plane. He cuts the umbilical cord that kept the growing body of science connected with its mother: natural philosophy, science of nature. Einstein says that physics produces its own concept of nature; it no longer owes it to any universal science. From its place as the first born of a numerous family of natural sciences, Einstein removes physics. He says that it is one science, without any authority for its use of the term 'nature' over any other science.

He says that the 'true' meaning of the physicists' conventions differs from the meaning generally implied. Now, before we ask more definitely what The Luther of physics has done to our colleges, let us ask what his removal of physics to another place proves, in itself, about our mental life. This question is of concern to educators. Because it tells us something about the rules for mental development in a living society.

Two methods of thinking delineate themselves: primary inspiration articulates meaning never before articulated, knowing that it has to be articulated for the first time. Secondary inspiration means re-inspiration by giving up deserted shells and going back to the 'true' spirit of a dying incarnation.

The distinction between primary and secondary inspiration is of importance because it applies to any diagnosis of living processes. In the science of life, the distinction of primary and secondary processes is coming to the foreground in our days. Some biologists begin to think that the embryo and the mature man are not related as a mechanistic preparation=embryo to an adult=final form but as the free, original erection of a form to its later permanent functioning. Rudolf Ehrenberg compares embryology to the understanding of the artistic process of creation. The embryo is what the artist is in the realm of civilization. The embryo sifts, in a really more vital process, an infinite number of potentialities. His risks, his exposure, his originality is greater than those of the grown up.

2. THE LUTHER OF PHYSICS: ALBERT EINSTEIN.

This is of some interest when we apply this to physics. Physics is not much more than 400 years old. It has been in the making in its artistic and embryonic phase. It seems to become a secondary racial process today.

Einstein is the Luther of modern physics because like Luther he sticks to the Bible of physics, mathematical language. One may

think, as we shall see soon, of a science of physics which does not use mathematics. Faraday was not well trained in mathematics. With Einstein, however, we are in the great tradition of physics which was formulated beautifully by Leonardo da Vinci: "No human inquiry can be called science unless it pursues its path through mathematical exposition and demonstration." ** Einstein still talks the language of the physicist's Canaan. In mathematical language, he tries to speak the Truth about the physical universe. Also, he keeps certain naive basic dogmas of the old faith: there is one universe. This universe is a unity. This unity is a unity of recurrent possibilities, usually called laws of nature. It follows the line of least resistance. And the simpler solution is the more probable. Finally, the closed system of nature follows one course, towards entropy. That is to say, free energy is at the beginning, tied up; fixed energy prevails at the end. Less free energy is available all the time. All this is the universe of physics of the last 400 years. Nature is one system. In order to achieve the oneness, it is put between zero and infinity so that any experienced part of the universe is neither zero nor infinity. It is a directed system, running down like a clock which cannot be wound up a second time. It obeys the laws of probabilities.

Into this system, Einstein introduces the observer in his human time. The observer ceases to be a subject, a mastermind outside the space observed by him. He is made a part of it. Time is labelled the fourth dimension of space. This, although it has interested us before as poor logic, and will have to be discussed in the second lecture again, is of less significance at this juncture than the way in which Einstein deals with the observer. The objective world of physics, as objective as the visible church of 1500, is put on the stage of the observing individual. This individual however, is a very purified individual, baptised with the baptism of science as much as Luther's individual. For, all these scientifically baptised individuals are completely equal: the difference between all observers in time and space may be neglected just as the multitude of Christian souls for Luther could be treated like one single soul. Luther simply took for granted that the differences of countries and centuries did not need to be overcome by any organic unity. And similarly, the body of scientists that has educated their disciples from generation to generation, this whole transcendent idealism and faith in physics, in objective space and in objective nature, is turned, by Einstein, into a convention. This agreement is said to be at the bottom of the whole scientific building.

This one convention, however, is only one out of many presuppositions in the science of nature. It is a much more complex historical heritage to believe in nature than to believe in God or to speak to man. There is, for instance, the presupposition of nothing. "Nothing" is the only unproved contention which makes all our positive statements possible. This is a bold assumption. Perhaps the idea of "Nothing" is the boldest assumption man can make. "Nothing" is not given in experience. Zero is a pure abstraction

** Trattato della Pittura, Parte Prima

without concrete substratum from which it is abstracted. A line, a point, a circle in geometry are abstractions the concrete stimulus of which can be remembered. But zero? Yet, higher mathematics and physics could not exist without it. And infinity is also an irrational and amazing abstraction.

Both are imported into natural science and mathematics from quite external fields of thought. Zero is ultimately derived from man's experience of death. For the first Greeks on whom this notion dawned, it still seemed as if it ought not to be. They did not wish to call it 'nothing', but 'what ought not to be'. Like the English word 'lest', it deprecates. We build on 'nothing' because nothingness must not exist; it stimulates us to transcend itself, to move away from it, to fill the vacant space. And Infinity also was a notion which the majority of the Greeks refused to accept. The Greeks did attribute Infinity to their gods. The Heimarmene, fate, hung over the Gods as over man. Infinity entered our thinking from theology. Theology learned nothingness as man's mortality, and infinity as God's immortality.

That it actually penetrated into mathematics from man and God, is useful to remember. This fact explains, why at the moment when man's faith in God vanishes, physics require a new basis. It has borrowed, from theology and Humanism, the two notions which distinguish the concept of nature during the last four hundred years. The concept of nature as used by physics is untenable today, because the loan is withdrawn. The bank of theology and Humanism is bankrupt. The centres which made the notions of infinity and zero look "natural", can no longer give credit to physics. And we suddenly hear of limited space, of a finite universe as the last word of physics. Zero, now, is a convention based on neglecting the velocity of light. Zero is no longer real.

And so, Einstein, the Luther of modern physics, retreats into a building in which physicists dwell alone. More classic than the classical founders of his science, he cuts the tribe of scientists off from the common-sense tribe of man, son of man, child of nature, and child of god, all in one. Einstein restores physics by separating the axioms of physics from the rest of man. His science is a convention between experts, so benevolent and condescending logicians, physicists, and mathematicians tell us. They assume an air of disgust when laymen get excited over this principle of relativity. R. von Mises, in reviewing Einstein and Ilfeld's, "The Evolution of Physics", bristles with understatement: "Science is common-sense, used for remoter and rarer experiences. Physics has meaning for those experiences outside our daily horizon, etc., etc."¹ My dear and over-modest friends, your utterances reveal a deplorable lack of dignity. Formerly, infinity was true, and finiteness was untrue. Mind was absolutely stable; matter absolutely unstable. Copernicus was right and Ptolemy was wrong. Why was this so? Because the basis of your physics was laid, outside your department,

1. 'Mass und Wert' 11, Zurich, 1938, 274.

by a general science called philosophy, the science of nature in general. And the clergy of this philosophy intended to deal, not with one special field of appearances, but with appearance. They never thought of these conventions as being conventions but as binding conventions. They deemed these conventions necessary and totalitarian. And they struggled violently to put them in the centre of every man's consciousness, as the leading principle of consciousness, of reason. Only yesterday, a colleague of mine wrote, in a book on God, that since the physicists had proved entropy, God vanished also in death through cold. Without exception, every field was subject to your conventions, because they were binding for physicists and everybody else, even a man investigating God Almighty.

As soon as you are just one group conforming to a standard, like cooks, shepherds, politicians, your science ceases to be of primary importance. It may drop out of our consciously cultivated horizon of first principles which we keep in store for unprecedented thinking. With the Reformation, religion ceased to lend itself to unprecedented problems. New problems then were tackled with non-religious tools of thought. For instance, natural law, mathematical jurisprudence, ethics more geometrico, replaced canon law, Roman jurisprudence and Christian ethics. The general public is excited now by the principle of relativity, not because it is understandable, but because it frees us from the "general store" of natural science; we can't buy there any longer when we wish to deal with unprecedented problems in the future.

Unprecedented problems must be tackled by tools of primary vitality. Only the life-giving general ideas of an era have that character. Like the embryo, these ideas live exposed to myriads of potentialities; they are undetermined. For the living substance of humanity, a first principle like the Church in 1100, like Nature in 1500, has the same value that the plastic character of cells and tissue has for the embryo. These formative ideas can still respond to any unprecedented situation. And we re-establish our unity only when we are plunged into an unprecedented situation. It is then that we reclaim one tongue.

As a matter of course, such plasticity gets used up and lost. The infinity of potential responses is replaced by a circular response to those stimuli which have actually left their track on the plastic body during its growth. The repetitive response to relatively identical stimuli, we may call "functioning". In this sense, then, the concept of nature, in physics, begins to "function" after Einstein. My friend, the professor with his finite God, is obsolete after Einstein. He no longer has to take orders from physicists any more than from cooks. In our fairy tales, we hear of a time when cooking was so all important that the whole nation used the principles of cooking for every unprecedented event. Perhaps this is the reason why people began to cook their prisoners of war, too. A mathematical jurisprudence, or an ethics more geometrico strikes me as quite as absurd as cooking prisoners. Spinoza, to me, is a superstitious primitive, carrying over a first principle into an

unprecedented problem, and worshipped for that reason, by all his contemporaries. And to borrow the motive of progress from nature and to speak of God's progress, compares to Spinoza's more geometrical.

Now, that all this should have happened, first the primary and universal significance of Nature in the Center of human conscience, and then its relegation, as a functioning partial thing, into the background, is inevitable. Like any living substance, a body of science uses up its potentialities; and that is its glory.

A science is a body of men sustaining the constant burden of doubt, halfway between ignorance and knowledge. A science is not the state of knowing. It is a perpetual restitution of an equilibrium between ignorance and knowledge. This is the reason why infinite progress in science is possible. A science must keep open toward ignorance and toward knowledge. It is an organized doubt; and the restitution of this doubt can go on as long as neither the unknown or the known part of the world is exactly the same in any given phase of the science.

3. PROGRESS OR VICIOUS CIRCLE?

If the research workers in any science should ever ask exactly the same question, and reject the same answer as they did once before, the progress of science would be imperilled. Since science aims not at isolated fact or data but at an attitude of people living between ignorance and knowledge, that attitude must be always new, otherwise life would go out of that science. We shall see that Einstein saved physics from this danger; and that other sciences are in the same danger now, only without a Luther to save them.

Before doing this, let us stop for a minute and weigh the physicists' assertions that nothing has changed, against our assertion that everything has changed. They can prove, by their publications that they always have said that two and two make four, and that they never allowed witches or ghosts to take part in their procedures. And yet, the physicists' good conscience has completely different content from their good conscience in 1500. Then, their good conscience consisted in having one word in common with all mankind. That word was nature. It is gone. The life-stream of humanity is feverishly searching for a new bed and groove in which to start for a new plastic and embryonic evolution of primary life and unprecedented experiences. And it is thrusting its consciousness forward in this new direction. And physicists now have a good conscience because they no longer have this common denominator with the primary intuitions of humanity. The sciences share the destiny of all organic life. You all know, from your personal experiences, of this transition from a formative stage to routine. We call routine what no longer occupies our imagination; it is so completely incorporated in us that our imagination is left free. We might describe

this inner experience, with Rudolf Ehrenberg, as a retreat into a more remote interior of our own being. The part which was all and everything a year ago, and filled us completely, now dwells on the outskirts of our existence, while our heart and mind move elsewhere. Einstein restates physics, rejecting that universal philosophy of "a nature outside the observer" which had called physics, among other sciences, into being. I think of Einstein, as much as Luther, as a reactionary, or a last classic. Luther has no drop of secular in thought in him although he prepared the world for it. Einstein has not one concept of a non-mathematical or non-physical character. This seems to be different in the case of other modern physicists. Planck testifies to a definite intrusion of thoughts which could not be thought under the government of that idea, so intimately connected with "Nature" with a capital N, the idea of a continuum. The adage "Natura non facit saltus" is well known. Planck abandons it. Similarly, we do find new ideas when physicists begin to transfer certain notions of living matter to dead matter. Certain scientists begin to talk of crystals, of electrons, as though they were organic substances. In other words: though Einstein still maintains the rigid notion of nature, (bodies as mere matter and forces) the influence of biology begins to make itself felt in physics. This, to be sure, is only a dim foreshadowing of what will happen. The process will be reversed. More and more notions applying to living matter will be thrown into the gap opened by the fact that physics can no longer live on its analogy to God's infinity and man's mortality. Physics, in due time, will come under the protectorate of sociology, just as theology today is the handmaid of philosophy and science. That will take centuries, of course. At this point, I might interpret the place of mathematics as a social phenomenon. I might suggest that mathematics deals with those truths in which the time-difference between the teacher's and the pupil's existence may be neglected safely. That explains why scientific education is relatively simple, the main crux, Time, making no trouble, here.

We may now understand better the history of philosophy during the last four hundred years. Physics and mathematics were at the bottom of the unrest and movement from Leonardo to Descartes,--to Leibnitz and Spinoza,--to Hume and Kant,--to Bertrand Russell and Whitehead.

The truth of any living body of science is kept alive by struggle. The struggle by which physics came into being, was carried on in philosophy. Struggle in the schools of philosophy begot and fostered physics. In this sense, it may be said that physics has only just come of age, in that it is fully emancipated from its parents, the two decisive schools of philosophy. Any surprise caused by this claim of philosophy to have begotten physics, will subside when we remember that only fifty years ago, in every American college, the apparatus of physics,--as well as the globe used in geography, the ruler used in mathematics, and the microscope,--were labelled the apparatus of philosophy. Philosophy, during the last 400 years meant to think in the light of nature. Philosophy was the wisdom of this world, with the word "This" as much capitalized as "the Other World" had been capitalized in theology. The two main forces in this science

of "this" world, then, were the empiricists and the system-builders. The empiricists, largely British, stressed the details to be discovered within the new frame which held up, before the detached eye of reason, the material world of space. The system-builders constantly repaired this frame; they reworded again and again the implications of Nature with a capital N. This school was mainly, but not altogether, represented by continental philosophers.

We have here a significant division of labour within a living body. It is not produced by "convention" as long as it is vital; it produces itself, by moving thinkers to this front or to that with unconscious passion. The word, division of labour, implies rational organization; somebody divides the labour. In the life of philosophy, although labour was divided, nobody divided it among the mortal philosophers. They found themselves challenged, every one of them, to take sides. The risks, the exposure, the unprotectedness of the whole movement seems to have invited champions, as knights in the Middle Ages took up the cause of the unprotected orphan or bride. Only when we compare the process of philosophy to such immediately vital responses, is it possible to understand the duel between the two European schools of thought. You will remember our definition of a university as the co-existence of different schools of thought in the same place at the same time and in dealing with the same problem. Remember Paris, Bologna, Salerno in their dualistic composition. We find here, in the production of modern natural science, the same principle at work. Instead of one city, all Europe is the scene of this struggle and dialogue. Europe is one city, so to speak, in which two schools of thought, system-builders and empiricists, correspond by letters and academic proceedings, and in corresponding among themselves, they really respond to and represent the process of taking possession of this world for the humanity in which they live and think and write. A third tradition, Jesuits and Lutherans, challenged the two schools as to their indebtedness to theology. It tried to admonish both Descartes and Bacon that their notion of Nature with a capital N was a historical creation, arrived at by an abstraction from man's state of nature as fallen, as complete nothingness. This third school was on the defensive. All other tones, like history and art, are merely overtones on this basic foundation of physics and mechanics. Today, Alfred Whitehead tries to persuade his fellow scientists that their concept of nature is so void of reality that the old Greek cosmos, with its gods and men inside it, should replace it once more. Whitehead, as a restorer of a concept of nature (in the sense of cosmos) rightly comes at a moment when the delicate bonds between science and the "nature" of man and God in theology are finally used up and destroyed. His attempt to go back, is significant as a symptom. We are approaching the phase where science may lead to a circular movement.

For, if Whitehead could get us back to the monistic idea of a cosmos in which we should suddenly have to face not only physics but beauty, love, god, speech, all as elements of this world, then, indeed, the whole effort of the past 400 years would be partially cancelled out. Think, however, of our going back to the idea of a finite universe today: another danger of moving in a circle. About 1900, classical mechanics was in a dilemma which might have

landed it in a blind alley or a circular movement: the fight between wave and atom, between matter and force, ceased to give results. As one physicist said: "Matter is victorious on Monday, Wednesday and Friday, and motion on Tuesday, Thursday, and Saturday." I think that, probably, Einstein has removed this danger of sterile repetition, by clamping the paradox of matter and motion in his "fourth" dimension of time.

4. THE CYCLE OF CLASSIC PHILOLOGY: WILAMOWITZ-MÖLLENDORF

The fact that a science may derail is new to many. Let me show the danger of merely circular motion in another case. Physics has escaped the circular motion which would make progress impossible; philology as literary criticism of the classics finds itself in exactly the same danger at this moment. As you know, the Humanists, in strict parallelism to natural philosophy, discovered the natural world, which preceded Christianity. The 'Nature' of science was paralleled by the 'Nature' of antiquity. The natural world was infinite like God and the nature of the Greeks and Romans was perfect like Christianity. The yardstick for all human nature was recognized in 'Classic Civilization' from 1450 to our days. Erasmus von Rotterdam exclaimed: sancte Socrates! And Socrates and Jesus were identified for the following centuries. Nietzsche embraced Socrates with his hatred because he hated Jesus. In murdering Socrates he killed the natural counterpart to Jesus. Modern college professors lecture on Socrates and Jesus in one breath. It is a mystery to me how they can do it. Plato takes the place of St. Paul in their scheme. As early as 1527, I find Erasmus saying that the fathers of the church were interesting only in so far as they repeated certain doctrines of Greek philosophy. In this way, the "Christian" texts were reduced to classical origins and sources. Physics traces everything to causes; it reduces. Literary criticism did exactly the same in the field of texts. From Erasmus, through Bentley and Wolff, to Gilbert Murray and Wilamowitz-Möllandorff and Werner Jaeger, philologists exercised the art of reducing texts to their origins. "Not Augustine first, but Plato already said; --not Shakespeare, but Montaigne or Castiglione said", is the typical form of this science. The dissection of Homer is another famous case of reductionism. In vain that such a great mind as Ridgeway protested. When one reads Wilamowitz' last work on the Odyssey, with its violent destructionism, one rightly shudders at the tremendous powers of obsession. This great philologist had three chances to regain his freedom from circular psychosis during his youth. Three great men who withstood the temptation of mere reductionism, crossed his path. All three felt the European catastrophe of the World War nearing; and they knew that the whole game of Humanism which replaced Jesus by Socrates, and Paul by Plato, was up. The first was Nietzsche who resolutely turned to the Pre-Socratics and Dionysos, to the matrices and womb of Greek thought. Wilamowitz wrote a venomous pamphlet against him. The second was Erwin Rhode, the greatest philologist of his time, who probed into the religion of the Greeks (without the Erasmus-obsession of finding the purer and more natural Christianity among them). But Wilamowitz who (by the act of superposition), read into Plato the belief in God, Freedom, and Immortality, withstood

Rhode's "Psyche" which investigated the lack of freedom, the ineluctable recurrence, the mythological bias of the Ancients. Finally, the great historian of antiquity, Jacob Burckhardt, tormented by the vision of the approaching downfall of the West, published his books on Constantine and on Greek civilization. Wilamowitz, this time, simply sneered. And after having denied the Lord three times, he went on for the rest of his life, as though driven by a demon, to reduce Homer. And with Gilbert Murray, he dominates the sunset of our era of a 'classical' civilization.

5. THE CYCLE OF BIBLICAL CRITICISM: ALBERT SCHWEITZER

In secular philology he did only what was done, with even greater zest, in the field of Biblical criticism. And here, the circular movement in the sense of a vicious circle, has been formulated by an insider thirty years ago. You all may have heard of Albert Schweitzer whose humanity led him to the Congo as a doctor who preached the Gospel to his patients on Sundays, but declined to be called a missionary. We, and the world, owe this new form of Albert Schweitzer to the crisis in Biblical criticism. Biblical criticism applied the methods used against the Fathers of the Church, to the New and Old Testament after 1770. It largely began with Reimarus.

In 1906, Albert Schweitzer wrote his "Von Reimarus bis Wrede, Geschichte der Leben Jesu Forschung". In this book, he showed that the circle was closed. Wrede, the last critic of the tradition on the life of Jesus, again asked the same questions of Reimarus. Research had moved in a complete cycle. Every gospel, every letter of Paul, had come under scrutiny. A lost source, P. had replaced the authority of the gospels. The gospels had been moved into the second century of our era. The authors Luke and Matthew and Mark and, of course, poor John, had been stripped of their authorship. But one of these hypotheses contradicted the other. And in 1906 a great mind like Schweitzer could see that Christianity could not expect any light on the life of Christ from continuing this research. He studied Bach and medicine, and instead of studying the Life of Jesus, re-discovered the death of Christ, and went to the Congo. In him, you may assess the significance of the decision: progress or vicious circle. A human being that finds his mental activities enmeshed in a pagan rotation or the revolution of a cycle, will react by a violent jump. Our colleges cannot afford to let any science fall into the rut of circular movement, because that would destroy all loyalties in the students. Cynicism, violence, exodus, must be the soul's answer to the chances of such a silly game. Cycles are just beneath our humanity. They all belong to secondary and tertiary forms of life. Our mind was given us for keeping in touch with primary life, to reach out for the improvable (to use an important phrase of the biologist Rudolf Ehrenberg). All pre-scientific thought indeed, moves in cycles. Biblical criticism ceased to be a science when it went cyclical. I could show the same vicious cycle as the downfall of economics. I shall, however, stop here and not divulge the astrology of the business-cycle.

Let me make two points about this development because they will help you to see certain parallels in your own field. One is that Schweitzer's insight came thirty years before it was generally verified and incorporated. This lag between a person and a science seems to me important. In 1932, Chapman, the learned abbot of Downside, England, published a big volume which restored wholesale the original chronology of our gospels. The lost source P., this ghost of a century, disappeared again. Mark grew out of Matthew, and Luke grew out of both. At the same time, the Roman tradition that Peter founded the bishopric of Rome and was crucified there, was reaccepted as genuine by the scientific world. In scores of essays and dissertations, men did this inch by inch. When one of these men, again, had given in to one other point in our original tradition, I wrote him a letter, and asked at what speed he intended to continue this circular process. And why it was so important to give in by tidbits of one doctor's thesis after another, when the general principle and trend was so obvious.

With Wilamowitz' death and with Nietzsche's devaluation of Socrates, the basis of our courses on "classical civilization" are gone. The idea of a purer "nature", of a humanity that is the true source and origin of Christianity, is gone for ever today, when the noble savage attacks the very values which humanism as well as Christianity were thought to embody. Nazism and Communism hurl their anathema against humanism and Christianity, and they quote the dark texts of Greece and Rome; they quote Frazer's Golden Bough, in their favour. The Humanists themselves cannot help falling in love with pre-socratic thought, pre-classic art like the Aeginetan reliefs, pre-platonic myth instead of Plato's ideas. The umbilical cord that connected classics and Christianity is cut. The very notion of the classic, then, is untenable as a general notion just as the notion of nature as a general hypothesis for our orientation is gone. The idea of classics and Nature gave our lives a clear place in the history of our race. They supplemented the existence of man in Church and State. To people who destroy Humanism and who don't even know of the Bible's existence, the alleged limbo of both, Plato, is uninteresting. And the same is true for Aristotle. In times of dogmatism and denominational precision, the father of definitions and of the syllogism was important. People today resent dogma and denominational precision. Why should they turn to their sponsor, Aristotle?

To sum up: Literature, literary criticism, linguistics, philology today lack their centennial fountainhead, shelter and roof. The world of classical nature in which the Renaissance believed as a kind of first edition of Christianity, collapses with "Nature".

The concomitants of a science of nature, in the sense of an uncorrupted lawful order, Greek and Latin and linguistic studies,-- must now look for a re-orientation. The study of Hebrew, Greek, and Latin will not keep their place unless they can find an absolutely new basis of existence. The classical world of an artistic 'nature' borrowed from natural science its timeless existence in abstract space. And since science now knows that this abstraction from time is a mere abstraction for the study of extraterrestrial processes, the

place of Greece and Rome in our college studies is unsettled. The philologists run around like mice seeking a loophole for protection and security in the new environment.

Mr. Einstein need not know what he has achieved. For, it was not he, indeed, who did it. He came when the times were fulfilled. However, the displacement of physics from its place as the first-born and very root of all the sciences cannot fail to involve all the departments which have lived on the assumption that Nature was a generality that reached from atom to Plato, from wave to music. That great Nature is gone which embraced everything except Revelation, and which came into being precisely with the purpose of rivaling Revelation.

Every normal American still holds this belief. And it is only among sober biologists that the downfall of the scientific hierarchy is seriously faced. I once more point to Bios I. (1934), by Adolf Meyer. As to the general lag and superstition of psychologists, historians, etc., I acutely remember James Breasted's last address, before the American Historical Association, on Social Idealism in Egypt and under F. D. Roosevelt. Finally, he said, the four thousand years of Revelation could be crossed out, and before and after that we might move in the refreshing air of purely natural idealism. This kindhearted anthropologist invited us to cancel out four thousand years of Jewish and Christian humbug. What can you expect of less kind hearted people? Breasted dogmatically believed that Nature was "better" than Revelation, and so he dismissed four thousand years of evolution, in search of his dogma.

The physicists themselves suddenly disclaim the idea that their concept of nature has a meaning for everybody. Their's is a nature for physicists only. And that means that it no longer includes the nature of man, or even of other living beings or of literature (as 'classical nature' did), or of language as the natural counterpart to revelation. Life is unnatural, language is unnatural, literature is unnatural, man is unnatural.

Our future line of demarcation will cut in between dead and living matter. And this is the decision, the cut which we have to make or to lose our mental life. It is a matter of life and death for any teaching and instructing and investigating mind, to know the new boundaries or to add to the powers of darkness and death in his own activities.

Man, having put his head and mind once out of this man-made prison "nature", may go further; he may pull his whole being, soul and body, out of it, too. The "denaturalization of the mind", (Jascalevich) must be followed up by the denaturalization of creation. We shall have to denaturalize man more completely, to save him from decay, to save his life, his society, his humanity. For, modern savagery comes directly in the wake of the domination of Nature with a capital N. It is a scientific attempt to plunge man head over heels into that heartless, lifeless nature of the last 400 years. It is the final victory of the witches. Burned 400 and 300 years ago, these

witches are unbridled victors today, with their black and white magic of the education racket, sterilization, drugs, surgical operations, Fascist-youth, guinea pigs, etc. etc. I am not speaking of the central scientific movement, but of the orgies performed in its suburbs, like psychology, or modern fiction, or Bolshevism or Naziism.

This conquest of man by his own idol, 'nature', is not a return to nature so much as an advance towards nature as an Englishman has termed it wittily. The great God Nature has grown to higher and higher stature. Now Nature has become so big that man humbly offers himself as a bloody sacrifice to this idol of his own making. It is the indescribable attraction of mere grandeur which probably produced the mass slaughter of human victims in honour of Quetzalcohuatl by so kind a nation as the old Mexicans. Nature, in the form of race and proletariat, is getting human sacrifices again. The nickname, advance towards Nature, may convey to you this irresistible attraction emanating from the man-made idol 'Nature' towards the modern masses. Our own make-shift, Nature with the capital N, is going to devour us, by denying us freedom, life, unity, creativity, peace.

By jumping onto the lap of his Buddha Nature, man is spell-bound by the big drum outside of him, and cuts his own throat. This drum of nationalism tells him that man has many natures, that you must eat others or be eaten by them. He is told that his heartbeat, his personal desire, his individual judgment, are nothing but blunders when compared to the nature of which he is a part. He is an artificially produced African. And he is all this as a direct result of the final triumph of natural science over its rival, theology. And the physicists who now are afraid of this end of an era, and discount their own responsibility, are in the minority among their own clan. The scientific Nature-clan is still numerous among the scientists themselves. Lawrence J. Henderson, because his mind belongs to 1700, is driven step by step to intrude on man's nature in every department of Harvard. He sponsored Pareto; he tried to have foreign Policy treated as the application of thermodynamic laws, he inspired an "anatomy" of revolutions. Please look around you, and you will see your world filled with pre-Einstein naturalists.

Man has fabricated the notion "nature" himself. Man always transcends man-made notions. Man cannot belong to nature since there is no nature except by man's command. To subjugate the maker of a notion to this notion always means to unmake him. Either we unmake man, or he has to be believed and accepted as extranatural and unnatural. The denaturalization of life is the great historical achievement of the last 2000 years.

Language, logic, literature are expressions of this lack of entropism and naturalism. On the other hand, let us continue, by all means, to speak of the nature of things.

And this reminds me that it should be possible to comprehend this whole diagnosis of the critical stage of many of our sciences in one person's grandiose attitude.

6. LEONARDO DA VINCI AND THE FIRST INDEPENDENT LANDSCAPE AUGUST 2, 1473.

The nature of things was perhaps never presented to us better than by Leonardo da Vinci. He exclaimed, in the face of Nature: "By your law, you compel all effects to proceed along the shortest path from their causes." Leonardo, in fact, is the best sponsor of this notion: the nature of things. We have already quoted his paean on mathematical science. With an exclusiveness and purity which even today takes our breath, he emerged from amalgamate false natures into the artist, technician, scientist, mathematician of modern times. Not swerving to the left or to the right, not arguing with priests or lovers - unmarried, untensored, unbound by anything else except his religious awe in the face of things - Leonardo, not Descartes, not Galileo, not Newton, and of course not that unspeakable featherweight Bacon, is himself the best man of the whole era. Truly, he is a child of nature. When he died, his pupil wrote: 'Tal uomo non e piu in podesta della natura.' It is not in the power of nature to produce such a man a second time.

The pen of his disciple cannot help to form the word nature in this dirge. But what a strange phrase: 'It is not in the power of nature'..... In a way, we all know that this simply is true. As little as America can be discovered by a second Columbus, so little is it in the power of nature to produce another Leonardo. In a way, however, we know that it is in the power of Nature to mix the elements so that she might stand up and say to all the world: this was a man, again and again. If we can be made to understand the twofold truth that Nature has unlimited possibilities, and that it is not in the power of nature to produce a second Leonardo, we may have understood the place of nature. And I think, Leonardo himself may help us.

In the year of our Lord 1473, on August 2, the first landscape was drawn by a human being, which was nothing but a landscape. This landscape was drawn by Leonardo da Vinci at the age of twenty. It was his program, quite unknowingly. Before that, pictures used to go with poems (as in the East today), with legends and with narratives as symbols; and they were painted for their relation to man and God, to meaning and creed. This picture shows only valleys and hills, light and air, as a spacious sight. Nature is here, without supporting or decorating anything else. The background seems to exist for its own sake. These were the words that came to the lips of his last biographer, Antonina Vallentin: "The background seems to exist for its own sake." I do not know of any more precise definition of natural science.

7. BACKGROUND 'NATURE' VERSUS FOREGROUND

Nature is the eternal background. The background contains all the possibilities that may come out of it at any moment: Leonardos, Napoleons, Chamaeleons. In this sense, the background of nature will always be able to produce potential Leonardos. Now, the science of Nature is that bold enterprise of men during the last centuries to

entertain the vision of this background for its own sake. That this is true, you may prove to yourself when we speak of the nature of a person, of a civilization, or of a group of people towards their betters. Whenever we relapse into the background, when a person dies, when a civilization collapses, when a science begins to move in a vicious circle, they all return into this background. Then, and only then, do we speak of the nature of a civilization or of a person. So often, in life, the only person who does not know the truth about his nature, is the man himself. Everybody else talks to everybody else about his nature; he never is told, from piety and respect; and so he dies of his own nature. Enemies render man the great service of telling him; and so he can let his nature die and rise again. The people who say behind our backs: "Yes, he is funny, you can't change him," simply condemn us to die. They treat us as nature; they push us into the background. The foreground is filled only with the impossible, the surprises, the improbable. The background contains the probable, the possible, the predictable. Scientists strive to sustain this background. They succumb whenever they leave the corresponding foreground, progressing, surprising, and achieving the utterly improbable. When scientists themselves try to become nature, background, their science collapses in a vicious circle. In the form of background, science falls back into the pre-scientific state. Today, most sciences begin to move in a vicious circle; colleges begin to move in a vicious circle, on account of huge investment in buildings and machinery. The new million dollar machines in physics, easily may sound the death-knell of progress in physics. The background-science may exist for its own sake as long as something goes on in the foreground which is not for its own sake. As a product and child of nature, Leonardo is possible always. As a background, nature is inexhaustible. As the first painter of pure landscape for its own sake, Leonardo is the first man in history. Leonardo is the first citizen of the era of Nature. And this cannot be repeated. It is not in the power of Nature to send one of her children into our history at the same hour once more. We do not move in a circle. Life is open still. It has direction. It may push certain processes of secondary importance into circular motion, to get them out of our consciousness. But our consciousness must be filled with first rate ideas, with life-saving ideas which are still unexploited and unrefuted. Here, life must go on as in the embryo, risky, plastic, unpredicted. Science must be forced out of its ruts in every decade. Man must survive his routine daily. A civilization must survive its habits in every generation. Things have to be done here, once and forever.

Foreground exists for the sake of the whole background. All routine, all secondary forms of life, all the organs of our body, decay when they do not serve and are not keyed up again by the growth of new leaf, the bursting of one new blossom, by the one step into the unknown and into the improbable which we experience when we ask ourselves where our heart really is.

Einstein deprives the physicists of their privilege to move in the foreground of us all. The foreground, however, at this moment, is filled with an exanimate humanity which has been told to stare into the background only. This cult of the background of 400 years now asks its toll. The pedigree, the race, the environment, the laws of

nature, the cycle, the curve, the background in education, the anamnesia, analysis, psychoanalysis, sources, origins, causes, reduction, is the dictionary of the modern person. And so we see him relapse into the limbo of the background.

Then, of course, when two people of different race marry, it is not called the founding of a new nation - which it is - but bastardizing. The revolt of the free is called maladjustment to the environment. The creation of a poem is just a contamination of sources. In looking into the background, we all become Orestes and Oedipus and Electra. In the background, causation is almighty. We call nature just one attitude of ours in which we forbid ourselves and the things of the background to have intercourse with each other. The background is the realm of objects. Anything put in the background ceases to have the right to talk to us, or to be talked to. It ceases to be a partner in our conversation. Objects are not conversant with subjects. Subjects converse with subjects. The whole attitude of natural science excludes the one commandment by which a foreground is created: that man must create subjects conversant with him. To say 'nature' means to unmake subjects. To use the word 'nature' is not the statement of a fact but the execution of a death warrant. In the world that is flooded with natural science, we ourselves are left exanimate on the battlefield.

Whom do you find in the foreground today? Children, maniacs, idiots, criminals. Only these seem to have the guts and the gusto to act in the limelight of a foreground. Decent people feel as if the background were the only decent place. In Chinese literature, the people vanish noiselessly through the back wall. In front, we listen either to the dummy Charlie McCarthy, or to Mr. Hitler. One is not alive, and the other does not speak, he shouts.

This has to be stopped. Fiat Lux! Let the curtain rise. Let us go out in search of the actor who is alive and who does not shout. One thing is certain: The background has a foreground whenever an actor has the courage to come out of the wings, to overcome his stage-fright, and to call another man's name. For recreating a foreground, a man articulates somebody's name. He does the only thing that nature does not do. He calls some body into life.