

January 20, 1939

How come it is with the universe.
Language, Logic, Literature.)

Diagnosis and Redirection of Teaching in a Nation.

1. Language as nature.
2. Language as social organizer.
3. Sentence and act.
4. Their four possible combinations.
5. When to change from one combination to the other.

To denaturalize language, became our duty when we saw the cornerstone of physics break away. Before the breakdown of physics, a universe of mechanics seemed possible. With this universe looked through, as one convention among many, every part of our world may claim to be discovered in its own way, once more. The dictionary is one means of objectifying a language. Everybody knows that it is one means only and that a "living" language, as it is called, differs from its projection into a dictionary. And yet, our task of denaturalization is not much helped by this feeling that the dictionary is a little bit too rational. Before we can ask for the biological function of language, we must first dwell on the fact that language has a naturalistic aspect; and always will keep it. Without this frank admission, we hurt a deep instinct in ourselves which, from our childhood, makes us experience language as something external and objective. And "external" and "objective" are only other words for natural and rational. Indeed, language happened to all of us as something natural. We drink it as an external potion. Lest we forget that language is a stubborn fact, our tradition has combined bread and wine and speech. Language, is there, before us, just like bread and wine. We can put it, in the form of a secret text, on the table with them.

On the other hand, this same language quits us in the form of an act. Whenever we speak up, we ourselves go into the words spoken. The words which we send into the air, are a central part of us. Can you think of any personality who has achieved realization without his words becoming and remaining for ever a part of that self-realization? These words leave us, but don't leave us completely. They are, for ever, just the very thing which we finally become. We write a book, and out it goes into the world, as our most intense and most energetic deed, able to reconstruct our friendships, bringing in and carrying away the companions of our life, creating and annihilating the world. Here, then, language is creative.

Now, for our purposes here, let me propose a usage of terms which will keep this ambiguity of language in our minds. Let us call one aspect of speaking, where we learn an objective language as a given and natural thing, like usual "language". And when we speak of any act of our own self-realization, let us call it by a specific term which today is restricted to writing only; let us call it, "literature".

In some ways, this is an unfortunate expression for oral processes. In others, it is just the thing we have to learn again, that there is not the slightest difference in creative significance between a spoken sentence and a written book. And since our strange brave world admits that some inspiration is in fact involved in literature, I see no clearer way of challenging you than to call every sentence for which you make yourself responsible, your literary creation, your literature.

The author of Alice in Wonderland, Thomas Mann in his "Buddenbrocks", Selma Lagerlöf in "Goesta Berling", all three talked to friends or children of their friends; they intended to have fun. Then the book was printed, and turned out to be the central book ever written by these same people. They created, in these books, a new language which is natural to all of us today, in England, Germany, and Sweden. Whenever you tell a story to a child, whenever you write yourself in another man's nervous system by giving him a strict order, whenever you and I sing together, we treat language as literature.

The difficulties in this usage spring from propoganda, gossip, chatter, and small talk. This kind of hushed language and commercialised language must not prevent our understanding that the life of speech is suspended between natural language and creative literature. Small talk is one of the ways in which speech disintegrates and finally dies. Advertizing, propoganda, and gossip are three ways of maiming, hurting and cheapening language so that again it finally dies. The word "cheap" is a significant description of the process. It loses its proper size and value; it shrivels like a balloon.

The fact that only living beings can die, whereas dead things can't and that we look at language as a process of biology,--this implies, obviously, that language undergoes creation and disintegration all the time. I mention these processes of decay right at the beginning, because man treats language like his peanut shells or his chewing gum, spitting and throwing them on the floor at his feet. He definitely has a naturalistic theory of language. His practice, however, is different. In a democracy words are sacred. And I find more language-worship in this country than in Germany or England. Only, just as modern religion is without theology so practical American language-worship is not supported by theory. Our theory covers only the mortal part and the processes of decline.

With this objection out of our way, let us go back to our contention. We said that language and literature are curiously separated today. One is treated as nature. The science of language is fostered by phonetics, accoustics, gramophones, physiological tests, statistics, grammars, dictionaries. The other is admired as genius, as Nobel Prize winning. But must Genius come to you in the form of a book? The creative power of speech is felt as release by anybody who, though blushing and stammering, is able to express a vital truth in a decisive moment of his life, to a person whom,--without this explosion,--he would lose.

In order that we may share more evenly the natural and creative aspect of speech, I have changed my own technique in these latter lectures. I prefer oral and improvised speaking. And in the first six lectures, I followed up the talks with summaries and commentaries written by others. This time, we have sent the whole lecture out to you in writing, and here and now we are commenting and going over it orally. This change of relation between the written material and the spoken word is one more attempt to obliterate the division between paper and acoustical delivery, and to unite talk and paper expression into one power for transforming natural language into creative speech. Once more then, I repeat, that words come to us like a natural dowry, and leave us as a social force.

And I propose to you the following plan: With this dualism between nature and genius, language and literature, we naturally ascribe scientific and mechanical tendencies to one side, and a creative character to the other. Why not reverse the process? Perhaps the very bricks out of which we create our social force, contain the heritage of genius, of creative processes; and, on the other hand, the works of great art, the Bible etc., may be treated like very natural linguistic products of lawful organization. Literature is less "free" than most people think; language is freer than the scientific tradition admits. Both together form one great body; and the life and death of language and literature are one process.

This proposition is possible as soon as we can change the bricks from the dictionary into the heritage of genius, into the living matter of energy-loaded cells.

Language comes to us as our mother-tongue. The biologist Rudolf Ehrenberg, in his manuscript "Metabiology", opened my eyes to the fact that we do not call language our mother's tongue. Indeed, language itself is motherly. This means just what it says: That man is moulded in the matrix of six thousand years by language. This is true, for every man: whatever language he learns, language reaches down to the dawn of history, and wraps him therefore, into the womb of time. The unity of man may be proved not only by the fact of possible intermarriage; but also by the fact that any human being may be brought up in any language. No race or creed excludes anybody from learning to speak any language as his mother tongue. It follows that any language serves an identical purpose of wrapping a newborn child of man in the complete, experienced history of mankind.

How this is done, we shall see soon. At this juncture, it is important to restate the unity of language. From our view point, all

languages are but appearances of one language. And that this is realized in every linguistic group, and is not only an objective fact, is shown by the eagerness with which every language keeps up to date. The translation of the Bible into more than three hundred languages is Christianity's one actual fulfillment of the promise of Pentecost. It is a successful re-unification of the rivers and rivulets of specific languages into one. The translations into Gothic, English, Bantu, Indian, Chinese, made necessary the creation of innumerable novelties which at the same time, brought back each specific three-hundredth of the tree of language to its own completeness and to its character as a true representative of all the powers of speech. It restored the faculty of every language to serve any citizen of the world as a complete chart of the world's history. For this reason in our era, languages have become immortal. Whereas, in ancient times, some hundred languages must have died out, it may be shown that not one language, in Christian times, has been abandoned as unfit. Vaccination, through translating the Bible, regenerated them. And so an individual language is still deemed able to represent language as such to a newborn child. The nature of all men comes to the child in the individual variety of his mother tongue. And mankind, in all its parts struggles at every moment to keep a universal language alive, in and through the medium of every particular language. As every flower contains the secret of all plant life, so every language contains the secret of universality, from the beginning of the history of man to its end. Language is the time womb in which we all live simultaneously in all the ages that have followed the physical completion of man.

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You and I are talking English. Now English is a constantly revived, six-thousand-year-old attempt to coordinate and organize people. For, now when we turn to the next question, and simply ask: "What does language do?", we immediately see the answer: "It groups." For, one man speaks and another listens. One man commands, and many obey. Ten people sing. And we create another form of grouping when three or four of us or more join in a free give and take. Language groups the outer world, too. Things are counted; anything that is counted, is treated during the count as part of the outside world which means that it does not speak but is classified.

Grouping, by spoken language goes on in every minute. And freedom of speech means the power of re-grouping. Man is free, as long as he may exchange the roles in speech, become a listener after having talked, a commander where he has obeyed, an accountant where he was a counted piece of inventory before. The democracy of language came into being when all the grammatical forms of any verb were put into the mouth of every new born child. In ancient times slaves did not speak, or they spoke a different language, or they did not use certain parts and elements of the language. They might not, for instance, invoke the gods themselves, as the family of the Julii could. We still have experts today who think that certain things can not be expressed by non-experts; this ancient tradition of priesthood is found today especially in education, medicine, and law.

Look at the astonishing fact that every child learns today "No" and "I don't" and "I won't". This is open rebellion. And when a person asks you to listen, if you answer simply, "I have listened", you thereby turn a process which the other thought of in the future, into the past. In the old days, a speaker was expected to close his speech with the phrase, "I have spoken". This kind of seal under his words allowed the others to treat his words suddenly as over, as past. The difference between an animal's cry and human speech is to be found in the articulation of "go", and

"I shall not go", or "I will go", or "let us go". Cries cannot be regrouped; they do not allow every animal in a pack to play a different role. In articulated speech, the members of a group share a common experience in individual ways. And every member is treated as a potential performer of all the other functions of the group. Language always puts more than one person in his social place. Because more than one person is involved language is never subjective only. And it is not merely objective. To speak, means to act for a group which, in this act, tries to recover some vital part of its territory, its environment or its inner organization.

In fact, the act of speaking has four aspects. The first is that when we use language, the whole past wells up in us. That means that we try to live on precedent, that each of us recognizes himself as one link in the unbreakable chain of all men. When we speak to somebody, we rebuild society by ascertaining one social relation between ourselves and the person talked to. If our speech has content, that means that we care for a bigger or smaller part of the world, the weather, the United States, the household, or humanity. And the fact that our interlocutor may reply in the same language as we ourselves, may ask us to exchange roles by listening to him, shows that we give him the right of a co-subject, a brother, to a certain extent.

We cannot speak without expressing four elementary aspects of any living organism: continuity of our form of existence from the beginning; responsibility for the future; a degree of unanimity with some other being; interest in some external part of the world. Any speaker stands on the (cross-road) between past and future and between the inner and the outer life. He looks in four directions: "forward", "backward", "inward", and "outward".

This, of course, has never escaped man's own attention. Most men, and society as a whole, always have played on the fact of these four directions and fronts of life. You probably know Dr. Cabot's book on the subject. In my Sociology, the play, the work and the religious forms of our life as well as the law are shown to be organized so as to secure the fullest representation of the inner, the outer, the historical and the progressive fronts of life. Even the logician admits three fronts of speech: the rhetorical for the future; the intellectual for science (which means the objective and external point of view); and the poetical for inner feeling and emotions. The main difference between my attitude and the reaction of the logician or the psychologist or the ethicist or the sociologist is this. They admit a plurality reluctantly; I make it the premises of any understanding. They hasten to isolate logic and poetics and rhetorics and so on. Since I see that (life) would vanish from this earth as soon as one of these four aspects of any life was not fully "alive", in other words, since I see the vitality of this quadrilateral, I cannot walk off into departmentalism.

We shall see that (to speak) means to be on watch at one of the four biological fronts. For the sake of the whole we try to rekindle the vitality of one of these four social attitudes whenever we speak. We shall have to walk from one front to the next and find that everywhere language completes action. And that to move constantly from one of these attitudes to the other, is more human than to undergo a (fixation) to any one of them. I also may remind you that a first glimpse of the problem came to us in the former lectures when we analysed the stages of human metabolism from a "You" to an "I", to "We" and to an "It" or a "They". To be educated, a child is talked to, (you) then learns to answer and to take possession (I), then to look back on experience as past and common and communicable story (we); and finally, after death, persons become object-lessons and may be looked at and analyzed like other objects of nature. This mental process of being an addressee first, an author, later, a teacher, third, and an object-lesson at last is our universal biological experience.

"Nature", in the sense of physics, cannot divide an inner world from an outer. The very words past and future in the sense of life-future, have no meaning in physics where no way exists to draw a line between unchangeable past and restorable future. The "future" in physics is beneath the "future" in biology or history; it is merely the projection of the past into the future. That is why physics claims that time has one dimension only; the recurrent past. Not only does not future exist. It also is meaningless to speak of a present in physics, where everything either is past or predictable future. People; with their calendar full of appointments to the end of their life are true representatives of the age of science. They have lost their future; they never can enjoy their present. They are lived by the past, consumed by the past and, usually, break down nervously under this load of predetermination. Life is an equilibrium between determination and taking shape, between nucleus and (fluid) state. From cell to civilization, an equilibrium must be established between formed and free matter. Or we fall ill. For a start in the study of this balance, just keep the simple figure of the crossroad (which we may term the "cross of reality"); looking "inward", "outward", "backward" and "forward".

With this orienting figure, you will not get lost in a survey of the linguistic processes which correspond to these movements in every stage of civilization, and on which we depend when we try to teach.

We may restate the four attitudes as four modes of grammar. We also may say: at every front, we speak at another phase of the act that signifies our actual living at this front. For instance, "listen" or "come": your word precedes another person's act just as Chanticleer has to crow before the sun can rise. When you tell a story, the event is over. The place of our sentence in the pattern of life differs. What we call grammar, is not a description of prefixes or suffixes. It describes, or should describe, the relation of word to act, chronologically.

The imperative ushers in the addressee into a new environment. By telling a child to do this and that, to walk, to obey, to eat and to go to bed, you violently pull it into a new social environment. The soldier who obeys, is the finest outcome of this power to remake man by the imperative of the oral word. In America, children are often bereft of their right to experience the power of speech in this creative form. When we admitted before that language came to us like nature, as our mother tongue, we omitted the important feature that, when we learn to speak, we also experience language, more than later, in its most powerful and creative mood, as an imperative. If the material of language may be called maternal, the moving force of the "go", "come", "do", is distinctly paternal. And our educators fail to see that language will always look like a dead shell to children who have been left without definite commands. The proportion of stammerers in this country is so large that people seem to have a fundamentally wrong attitude towards speech. It never has pierced them like a shot. The paternal creation of environment has not kept up with the maternal material for it. Thus, a child experiences language without the proper metabolism and intensity; and the very strange situation of language in this country is an outcome of the Declaration of Independence when applied to children. A child, when called by its name and thrown, in the white heat of creation, under the hammer of the word "Go", experiences its own plasticity. We all must keep that memory alive for the rest of our lives, in order to keep our plasticity and growth. The very fact that the English language has abandoned the word "Thou", has changed the biological structure of English society. It has made for that terrible division of mind and body, which is quite impossible when the "Thou", -- Body and Soul --, receives an order from the historical "We", its parents: and the whole child moves at once under its imperative. Our

intellectual situation under an imperative,--as when Augustine hears his command of conversion: "tolle lege", take and read,-- seems to me strange; when a command pulls us together, something happens inside of us. A rift is closed. Our own (consciousness) does not stare at itself in division as usual, but is pushed and pressed to the (side of our body) as one and the same with it. The imperative that comes to us, either neglects what we think or plan or feel, or at least makes it a matter of the past. And here we see, how all our previous consciousness, intelligence, thought, itself, may be turned into mere matter, into something that loses the quality of life, because a new day brings a new order and challenge to us. Any doctor knows that the decisive thing is to ask the patient to do something or to leave something undone. Any minister should know this, too. The imperative that comes to you as "thou", makes "thee" over, because it forces "thee" to forget thy former blocking or critical or lame prejudices etc. The imperative puts a man somewhere else. And all he does is to follow it up, body and soul. The word, the sentence, in the case of the imperative, dangles ahead of a person. So-called (ideals) are general imperatives dangling before us. I prefer specific imperatives because they are concrete, and can be fulfilled. The lack of grammatical understanding has produced this abstract idealism which never allows us to feel satisfaction, because it is infinite. We shall see how destructive this lack of satisfaction is, on any front.

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link to act

3

In the (imperative mood, the sentence precedes action. One person speaks, the other acts. The acting person pushes his consciousness over, to the side of his own body or past, in order to comply with the light that like a star leads him on. The imperative creates a future for the person who responds at the very moment when he responds, for this simple reason that it dejunks him from his own present and past consciousness. To respond to an Imperative, means to give up my own spirit, my own thought, and to be (re-inspired).

This whole front is either never mentioned, or left to eloquence and rhetoricians. These, however, never analyze the situation of the (addressee). But in the imperative, the only significant fact is our hearing the imperative as meaning us, and projecting us under the anvil of somebody else's insight, will and feeling. The fact that man is called forth into being by (malleability) recalls the state of mind in which we are willing to heed the (command "love me") or "listen", the pre-ject state of mind. I do not see how that can longer be put on the Procrustean bed of either subject or object. When I am challenged to listen or to love, I begin life all over again, and the new life although it will contain both objective and subjective elements, will first of all be a new life, which is pre-, ahead, of my former life. Hence, my thought must equip itself with this term "preject" for a vital form of my existence.

Since the (conscious) recreation of the pre-ject form of man is the general problem of our days (look at the desire for being ordered about, in (modern youth and masses)), I have dealt with it first. Other facts recommend this, also. The imperative is the root of speech. In the Indo-European, the Semitic and the Basque languages, the imperative is the root form of the verb, and often of the whole word-group. In the imperative, the (political) character of speech renews itself inasmuch as most new words begin their career, in antiquity at least, as Imperatives. For, since the imperative i, ama, go, coincides with the verbal theme or stem, the new word will come into a society when a new step has to be taken by this society.

With the imperative, the (Vocative) is, of course, intimately connected. And the Vocative, too, is the shortest form of a person's name. Around the Vocative and the Imperative, then, all grammar is built.

The physical world has no future and no past. The future begets the other fronts of life. First we must have experienced change before we can distinguish the fronts of "inner" and "past" and "outer". Through the imperatives to which we respond we can discriminate against former phases of our life, in the light of the future, as opposed to the past; can adjudicate all acts to "outer" and "inner" to good and evil; and can assimilate and dissimilate them. The "inner" and the "outer" mark the line of demarcation between the things which we include in marching towards the future, and those which we exclude and fight and exploit.

When we stick to our guiding insight that grammar determines the chronological relation between action and language, it will not be difficult to deal with the other moods. In the Imperative, speech precedes action. In the perfect, action precedes speech. In Jesus' words: "Consummatum est", it is finished, the participle follows the mute suffering and illuminates it, a posteriori. The participle is the truest form of the past. Whereas the imperative everywhere is the shortest possible form of the verb, the past participle is always richer and the perfect in many languages is based on the principle of reduplication. The (unchangeable past) is not compressed into one short moment of decision: "Come." It tells a story that unfolds itself slowly: "And then we came". A story always abandons the antagonism between the commander and the obeyer. "We" expresses the normal attitude towards the historically experienced past. This "we" comes on our lips when we wish to say that, not a personal whim but experience dictates an attitude. Thus, a lawyer will say, or a doctor, or a head of a school, "We think" or "we usually do this, in such a case", although the speaker may be the only person at this moment who still does so. I heard an exiled friend from Germany defend a theological position which was one hundred per cent of his own making, by always speaking of "We religious socialists". It made his story respectable. We are respectable when we have lived with other people peacefully a certain length of time, and have shared their lives. Stories, and the word "we", tell us that we have travelled together, and have "tra-jected" many an abyss, many a canyon. Against pre-ject for the future, I propose the word "tra-ject" for the civilized being who has lived and now teaches the young how "we people" did it. We are Americans. We are the people. We are, because we have been. A child is, because he shall be; his name is given him from the outside; it is done up in a parcel and mailed towards the future. We also are, because we have been. We make a name for ourselves in history.

The original and underivable pattern of pre-ject and tra-ject) is completely overlooked in our modern naturalism about man. In trying to reduce man, like everything else, to one cause or pattern, philosophers either have destroyed the reality of these two moods, or they have so abused them as to reduce everything else to one of them. Josiah Royce wrote a Philosophy of Loyalty. Here, he first admirably discovered and described the loyalty which is the way in which we are connected with the past, and with ours and other people's habits and experiences. But Royce, as a philosopher, had to delete all other principles of life; and so, his loyalty is a Chameleon which also means love! How any man, for loyalty's sake, ever could leave his mother and father and cleave unto the wife of his choice, I don't know. Royce, however, actually subjugated love to loyalty, a typical New England and Old England attitude. Loyalty is an expression of historical continuity; loyalty can never justify any break. And when we compare the narrator of experience with the commander of an imperative, it is obvious that they make opposite efforts. A command is a star shining from the future; a narrative takes the listener back into the past. This is achieved by exactly the opposite technique from the techniques of the imperative. The many times of the past, slowly unfolding themselves, become so numerous that, compared to their total length, the present moment

springs into nothingness. The very word "we", implies, to the listener, that he, too, cannot help being "one of ours", an American, a man like those many rows of "we" who have lived before. Whereas, compression into one point, one star, is the lover's means of encouraging the beloved to jump into the future. The unfolding of an endless sequence is the means of pulling the listener into the past, and making him one more (repetitive) wave of that (unchangeable past.) Man loves to be told that he has been "tra-jected" into the present with all the good and true of time immemorial. In history, we identify ourselves; in (politics), we distinguish ourselves. All mankind embraces us from the past. But when Romeo says: "It is my soul that calls upon my name", his unique personality is called forth to fulfill his destiny. The "traducian" problem of carrying over from the past, is an old theological puzzle. When we now give the term "traject" to man when he is being asked to share the past and "preject" when he is challenged, and add these terms to object and subject, we only (unite philosophy and theology) into one. In philosophy man is divided into an "inner" man, the subject, and an "outer" man, the object. Man's body is treated as external, his mind as internal. Now, with "traject" representing experienced past, and "preject", malleable future, it will be easier to do justice to the old categories of subject and object. The historical and the changing in us are as real as the subjective and objective. being

The main trouble arises from the fact that the chronological relation between spoken word or reflected thought on one side and action and processes on the other, differs in all four cases. And since nothing but these two cases of a subjective or an objective attitude have usually been observed, the time relation has escaped notice. For, whereas we already know that the imperative precedes an act, and the narrative participle perfect, "It is finished" follows it,--the subjective and the objective attitudes are concomitant, and simultaneous with the reality which they describe. When I observe the external fact,--rain, or when I express my inner grief, the rain is there when I observe it, and the emotion is here just when I express it. Hence people come to the conclusion that we may either follow up reality by speech, or suppress expression. Any (compulsory connection) between physical and mental process is either denied, or left undiscussed. You may think or you may stop thinking. You may sing, tell, command, or you may not. In short, all language is treated as rather casually connected with the world of matter. The mind is free to turn towards it, or not to work at all. Now you will understand immediately that this indifference to the chronological relation of act or experience and the spoken word, denies the biological character of speech. (Vital) processes cannot be omitted ad libitum. If the mind were detached from reality, and if our words might be spoken or may be left unsaid just as we please, then, indeed, (speech would be a mere tool) in our power, to do with it what we liked.

It was the (mission of Jesus) to restore the relation of word and act on all "fronts" of life. His commands, his lyrics, his concise formulation of natural laws, are perfect examples of the different (moods of human expression of reality.) Now, please observe the last word that the "Logos", the living word, is said to have spoken. He did not make speeches from the cross, as modern political martyrs have done. He did not play the hero. He did not wish to go on record with a statement for the papers. To the "front" of suffering, of pure experience, no other vocal utterance belongs but the participle of the perfect. ("Perfectum, Consummatum est.") It is finished, is his word. Now in this word, if you will concentrate on it with a real effort to get rid of your wrong grammatical training,--in this word, I repeat,--mind is not observing matter; one soul is not subjectively seeking another soul, no gospel is preached. Something usually not even mentioned, is the meaning of this sentence: that words are acts, and that those acts are (phases) of the life process itself. In completing its course, life is

leading finally to utterance. This sentence is the last part of the crucifixion. That he can, after complete despair, take up the thread of human history as it has run through Abraham, Moses and the Prophets, and recognize his own death as the historical sequence of the life of the race, -- this distinguishes his end from that of his neighbors on the right and the left; only this tiny little bit of the three words, stamps the event into his own experience. He appropriates even this.

And much
~~Words are squeezed out of us in danger, so that we may keep our identity, as in his case, or so that we may find a new way out, as when a command falls upon our ear which puts our own name in the vocative. It is my guess that the short forms "John, Tim, Bill" in English, should not be called pet names or nicknames, but true vocatives.~~

~~Identity with our kind and a new way into the unknown become ours only when expressed. (History) writing and (political speech) are no luxuries; they are the life blood of the race, running through an individual who wishes to keep his identity and to find his future.~~

ritally nec - 106 can't help
With this result, we can probably cope with objective and subjective language in a biological way, too. That poetry is no luxury for the poet, that the poor fellow simply must sing and rhyme, is now generally admitted. Logicians don't dare to deny that the funny creature must "get it out of his system". That slang phrase describes very well what speech is poetry. It is the expression of an inner process. It certainly is simultaneous with the emotion; but it bursts all the dams and dykes of convention. It pours out. The inner man breaks out. And he is not alone in this. The explosion of great lyrics represents the emotions of a whole group.

Now this lyrical mood, in language, is represented by the optative or subjunctive. To express inner feeling, inner, subjective modalities, a special grammatical mood was created. And again, a special grammatical person was connected with the optative or subjunctive (the discussion of the two moods, subjunctive and optative would lead us too far).

16t
When the world of feeling is expanding within us, when tears darken our eyes, or laughter moves our jaws, outer sensations, memories and intentions, fade out, and we are filled full from within. When the tension becomes unbearable, we must cry; or, if we remain human, we must sing. And in this stage where I dare confess my inner state of feeling in excitement, I become personal, I am talking of myself. The ego, the I, which today is treated like an objective entity, is, essentially, lyrical and emotional and subjective. We shall see how long it took humanity to transpose the "I" from the inner, lyrical "front" to the outer where we find it today, as the subject of science. The emotions are the source of the perpetual rebirth of the "I" in every human being. The suppression of the emotional life destroys the "I" in later years, just as much as the amputation of the spoken imperative (sterilizes) action and play in a young child. Spoken imperatives must precede action. And expressions must accompany emotions. Or acts and emotions die; and, of course, the part dies when it is not told. *16t*

16t
The (embodiment) of the inward "front" of life is found whenever an "I" must break through the encircling gloom with a song of praise or joy or sorrow. What else but an "I", could bridge the gap between inner and outer by sending its (condensed) message, the quintessence of his inner life, into the world? It always takes power to overcome our shyness, when an emotion requires expression. We look for a banister to lean against. Lyrics need form, rhythm, to stand on their own feet in a world of plagues. Poetry wears its

raiment of meter because it goes out from one against the many, from the warm heart into a cold world.

And now, we may turn to the "front" which, in grammar books, gets first place, the good old (indicative:) "it rains", "they go". We have stripped from the indicative its claim to contain, genuinely, the first or second person. In fact, it may be proved linguistically that in Latin the second person of the indicative exists as a later loan from the imperative. The neuter, the third person, is the source of the indicative. The indicative observes facts in an outside world. It externalizes the universe. Today, when we speak of ourselves in the indicative of the present, this means that we have been able to (objectify) ourselves so completely that we become a fact to ourselves as much or as little as any other fact. The proper world of the indicative is nature, the world outside of ourselves. To use this form, means to see and to face facts. But facing is only one attitude of living substance. We also hear, smell, touch, and taste and in neither one of these cases, are we so (detached) from what we hear, smell, touch, and taste as when we see it. (Visualizing) the world is the great urge of (reason). We are emerging from an (era) in which sight was overdone. Directly and metaphorically, vision has been the one sensation cultivated. To face facts means to rationalize. We see objects. What we see, we can count. The indicative is the beginning of the arithmetical statement that something "is".

The indicative deals with ("Being") and that applies only to the external world. When Mr. Gilson was here, I was very much interested to find him getting excited, in all his lectures, whenever he pronounced the word "Being". All philosophy in Greece was based on the question, "what is"--what is substance, essence, "true being" behind (appearance?) You see the passion for the visual world. Both appearance and being are judgments on the outer "front". In my feelings, in history or in the future, I know nothing of being. I know of events, of what ought to be, of (becoming), of movement. And, as a thinker, I find it very hard to understand this passionate search for "being", which the scientists push so far that they can get the future and inner movement and history of past into their ken through their method of counting and discounting objects. They never will. Eyes are given us for great purposes, but not for all. And if we wish to state the specific purpose of visualized language, as used in the indicative, I would say: the attitude expressed by the indicative is that of the dompteur. When I state a fact, I am master of the situation. Man exercises his power over nature when he keeps so aloof, so unshaken that he can describe it. The victorious attitude of man in his struggle with outside nature is expressed by the indicative. We can come to this conclusion from another side, too. What is the chronological sequence between physical process and mental expression, i.e. language, in the case of "it rains"? We roughly said that the description is concomitant, simultaneous. Reason states what is, here and now, before us. And the sentence, the equation, the statement which we make about it, is the one imprint which external fact is allowed to make on us. Rational thought is that minimum impression which the visualized world makes on us, and which we, the victors in our defence against the world, cannot help admitting. Expression of feelings, impression of facts, are the two processes in which act and word are treated as contemporaneous. Since, in the indicative, the imprint on man is the whole center of attention, language in this form, easily shrivels into mere thought. Speech becomes thought, man becomes a mind when he is impressed by the external world. And statements become impersonal. "It" is the clearest term here.

An instance taken from society may help to illustrate the connection of the third person with the indicative. In a human group, the one person visible as an outsider, is the outcast, the criminal, the scapegoat. He is an object of persecution. He has ceased to be a comrade and a son and a father. He is a "he". In

the laws passed in Greece and Rome against criminals penalties were expressed in the imperative of the third person, "If somebody kills, then he shall die". How was this new legal imperative built? Was it simply a loan from the existing imperative ama? Not at all; the new imperative was derived from the indicative. The forms, esto, sunto, are based on the indicative: est and sunt. For public opinion the criminal remained a "he", a man outside the pale. To extend the imperative by which father and mother call their child, seemed quite unfeasible. The law moves at another "front" from command. And this, again, is completely forgotten today: that the imperative is an outpouring of (love); the law expresses victory over alien nature. These two things are so mixed up, that most people think the genuine imperative cruel, and the law human. The result is communism, a machine-state.

This modern ^{fact} misunderstanding is deep, because that part of the universe which resisted the conquest by the indicative objectivization—longer than anything else, is also caught in its net today. I am speaking of the strange grammatical formula "the ego, the I", which we use today, and which is only 150 years old. When Descartes said "cogito ergo sum", he indeed ascribed being to himself. But to speak of myself is not as radical as to speak of "the I" in general. Generally speaking, the "I" ceased to be a "traject" and a "preject". It now came into the focus of the objectifying eye. Generalities are given only in the indicative. The imperative is specific, the participle is concrete; the optative is personal. The impersonal is possible in the indicative only. The world of reason is the world in which even the "I" is an "it", and is classified among other appearances. Perhaps, the chapter on Descartes which we sent out before the first lecture, will now be clearer in its implications.

By articulated language man is able to live in the center of the cross of reality, —between the inward, outward, backward, and forward "fronts", between you, I, and it, in one time and one space) despite his individual mortality. Mankind covers the whole of space and the whole of time more and more, because language conquers more and more space and more and more time, and the re-unification of languages unifies this universe of ours perpetually. (All organic life exists where an outer and an inner space must be distinguished, and where a past and a future both require the love and loyalty of the individual. But language creates one unique being through the ages.

We are able to keep our direction and our former gains; we are able, also, to keep our place on earth and in unity among ourselves, because language survives the bodily corpses of the mortals who speak. Not to speak, is to cheat mankind of our partnership. Here, we have the reason why lying is the sin of sins. And, in passing, it may be said that withholding a man's contribution by speech, or its falsification, is labelled differently at every "front". The libertine withholds his imperatives; the reactionary, his real experiences in the past; the hypocrite, his feelings; the liar, his facts.

Our ancestors, in creating (grammar), were just as creative as modern creators. They tried to establish us in time and space lastingly by a conscious effort. And we simply exploit this creation of those alleged primitives, articulated speech, as a means toward our own salvation.

No society could exist without the perpetual renewal of the creative commands "Love me", and "Listen". We are told today that love cannot be commanded. With this doubt in their hearts, modern American poets try to write drama. Mr. O'Neill seems to me the American (Strindberg) who has gone the farthest in this direction; but all the others are infected with hatred of the imperative which

would open a door into the future. In "Mourning Becomes Electra", the non-opening of the door is the basis of the whole play. And hence the drama ceases to be drama. Without a new solution, a new imperative, a victory over the impossible, dramatic art is a contradiction in terms. Mr. O'Neill denies us the katharsis, the purification, which comes to us when we catch a glimpse of the future in which tragedy ceases to be tragedy. These poets all sing: "I love you" (optative), and then go on: "Why don't you love me?"

And yet, every human being knows that we all are proposing to the world all the time. Love, in fact, is one of the few commands that are always in order. It is clear re-grouping of people. That is what the imperative is for. Any invitation, any constitutional convention, any meeting, is nothing but a variation of this one melody: "Love me". And no imperative will be obeyed spontaneously when it is not a variation of this one. Children obey their parents, because the imperatives are merely applications of the one imperative. And they obey only as long as they are that. The very first right of human beings is not free speech, but free listening. By forbidding the Jews to hear music, plays, read in libraries, the Nazis in Germany, cut them off from listening. That really is a denial of human rights. This leads us back to our former statement that, in a sound education, language should come in the form of the mother tongue and in the imperatives of a father land. Then the child will get both in one: the experience of loyalty and of regrouping, of continuity and change. Today, too many people don't hear themselves invited personally, by their name. And thus, their social future is denied them. The calling by his name, is the incorporation of a man into society. Without it, he may be overactive but he will achieve nothing.

And on the side of the backward looking "front", the past cannot end before its story is told. The Trojan war ended with the Odyssey, and not one moment earlier. Though all people practically act from faith, so few people know it that to speak of the past is our last metabolism in living the past. The meaning of "story" is watered down considerably today. It would seem that we picked up stories at random, here a chapter on Charlemagne, there on Greek art, and there on Shakespeare or Henry VIII. It seems casual and accidental. My attempt to write history as our autobiography is justified because the past is a ghost when its story is not told. Every person must get his obituary as much as his name; wars must get theirs, and anything which man has survived through danger of death. Lest you mistake me for a man not passionately devoted to thought, let me praise the external "front" too. To look at things coolly, to face the world as it is, frees us from the constant danger of being submerged by a hurricane of impressions. The human eye is the proudest organ of our central nervous system, because it has begotten the freedom of our arms, too. Human arms and hands, in the evolution of man, seem to have followed the centralization of government in his brain, and this means that, whereas the rest of the body had a nervous system of its own first and later delegated it to the head, the hands are the result of our central administration. Our organs, originally had the rights of States. Our hands are Federal by establishment. Their being Federal allows them to be hands, not feet. This, of course, is a mere suggestion, not any scientific conviction. But it explains why I like to call the hands eye-born.

I am eager to show the interplay between eye and hand only because this interplay also exists between science and technique. Science is the eye purified from appearances in space. It is the true picture of all processes in space. Technique is the hand purified from its individual limitations and deficiencies. Even science does not merely describe things with which we may or may not deal. We must see what is around us; and our thought of the world is the way reality completes itself within ourselves. The eye has only

seen fully those objects that cannot be stored away in clear definition and classification. The form which language takes in dealing with external things, (rationalization), is a (phase) in the process of seeing.

What phase, then, is occupied by the reasoning process? It is obvious that it does not precede and that it does not follow. The statement that "it rains", means "it rains still while I am talking or contemplating". The earth is round, the sun shines, we are in the midst of a depression; all these statements express simultaneity. And yet, I venture to say that the phase of reasoning is placed between two organs of our cognition of the outer world. Does it not take the place between eye's sight, and hand's reaction? In this case, the fact that observation is poorer in vocabulary, more intimately tending to be mere (thought), would find its explanation. In reasoning, language is placed in the inner space of the observer, between eye and hand. As thought, it fills an interval between observation and reaction. And this interval takes its place within the human person. Hence, the shadowy form of speech which we call thought. When thought is meant to become common observation, (common knowledge between many, when it becomes science instead of crude empiricism), it still has little eloquence, it is definition, number, figure, measurement. (Nature) really is what impresses us. This impression is harbored between eye and hand, to the exclusion of the other organs of (self-realization), heart, ear, etc. The effect on this kind of truth from eye to hand is that it has both a kind of (precision) and a kind of (flatness) too, which is lacking in other branches of speech. Scientific calculation is the modern form of this (indicative) that dovetails man into outer processes by observation first, and manipulation later. This scientific language really is a kind of (whisper) compared to all other languages. It is "thought"; and thought is speech spoken to ourselves.

Logicians always are very obscure when they have to define how language compares to thought. You may prove to yourselves that you all treat your thinking as speech, by examining the process of thought in inner meditation as to the place whence your (vocative) comes. When a hurricane happens, physical or moral, you will turn to yourself by saying: "Now listen, Bill, I had not expected this from you"; or: "Don't you know, don't you see?" "Don't be a fool". The words You, Bill, Tom, never represent the voice that speaks within us. Bill always is the person talked to! This we found in the imperative. It is true when things speak to us, too. They ¹⁵³ impress themselves on us so deeply that we must let them speak. An elephant? Yes, an elephant. "This is an elephant", means that the elephant sends his visiting card into your room. And this card runs: "An elephant, Bill". When men unite their experience, this process of having been talked to by the universe through the eye of one person, must be carried over to the hand of another. One acts as eye, the other as hand. And the indicative bridges the gulf between my eye and vision and your hand and skill. (Reason), then, is that form of life which compels us to take cognizance of an impression by defining it before we react. ¹⁵³

I have not finished my investigation of the (temporal phase) for expressing emotion. That it has its own, I am convinced. My suspicion is that it is the realm of answers as much as science and mathematics represent the realm of (questions). The ("If") of a mathematical hypothesis is wholly external question. Poetry is wholly apodictic; it would die of "ifs". It is external response. ¹⁵³

What is true of language is true of literature. Here nobody has ever doubted that history writing and story telling follows the event, that art expresses, science impresses, and political harangues begin. Today every one of the "fronts" of speech has reached a perfect style of its own. Prose for stories, mathematics for the natural aspects, poetry for the emotions, and eloquence

for reform and revolution are four terms of speech so distinct and so gigantic that the original bricks out of which they were built, are forgotten. Because man feels sure that he disposes of the same energies on a more complicated level, he has made all grammatical persons and moods interchangeable on the first level. Although I cannot "rain", I am allowed to say that "the I is". The rain is allowed to sing of its emotions, as much as night, morning, stars, sun. I may give a command by saying: "Would it not be nice if...?" This free interchange of the grammar:--

I act
you act

he, she, it acts

we act

you act

they act,--

this obstructs our view of the truth that the moods of poetry, eloquence (and this includes preaching, begging, canvassing, pleading, vote-getting, inviting, etc.), mathematics, and prose are remade daily by our living on the crossroads between "You, I, it and We." The grammar still is: inward, "O that I acted;" backward, "(We have) acted"; forward, "Act!"; outward, "It is acting."

Now, for redirecting our teaching, and for diagnosis of our modern scene, the value of these relations between four different personal "fronts" is this: that they are real relations. Not the multifirmity of these processes is so practical. Not even the great discovery of the various phases occupied by speech, with a difference of chronology for every form of Chinese best seller on the Art of Living, tries to convey: that all these "fronts" must be cultivated simultaneously. That we have to "shift" from one "front" to another again and again. That the group has a common life only when people work, feel, tell and think together. Prose, science, eloquence, poetry must struggle hard against each other, to keep society healthy.

The reduction of all language to scientific language leads to madness. This, the symbolic logicians are trying once more. They are cheating and lying because again, they wish to deprive us of their imperatives, their experiences, and their emotions, and to make us believe that they live on observation. Symbolic logic is the result of that "one-legged" philosophy which mistrusts any reality which cannot be reduced to a single principle, - as Josiah Royce discovered Loyalty and then wished to found everything on loyalty. We shall see the greatness of his on-sidedness on the next evening. But whether that on-sidedness be great or not great, we shall be destroyed if time and space, theology and philosophy cannot meet in a higher integration. In every classroom a teacher must meet his students on all four fronts, or he will not teach.

A person who tries to live on one "front" constantly, loses his roots and powers on the others. A pure logician, a pure rationalist, is a déraciné with regard to the past; there, science destroys his roots. He is a child, as has been said here before, with regard to the inner "front". For to deny your emotions the outlet of poetry, simply means to starve them. Childish is the word for the emotional life of a scientist who is only a scientist, and for his kin. And in relation to the future, we only can say that they are foolish. Thinking of the future as something that will take care of itself, they open the door to every tomfoolery in politics by their helplessness, vague utopianism, and lack of command. We leave the children to whom we teach science in the vulgar sense of this word uprooted, childish, and foolish, and nothing else.

The creative efforts of group command, telling an experience, making a poem, fortunately are spreading widely. Those big entities of the recorded past in history, of political effort, of scientific research and observation and of poetical expression, form a delicate equilibrium in every civilization. Incessantly, this equilibrium has to be restored. The grammar of language and the grammar of society are one and the same vital effort. Complicated as the equilibrium has become today, -- with the arts, sciences, legislation, politics -- it follows the simple pattern of allowing society and all the members of society to come true in space and time, and to embody the universe more and more.

X.

At this juncture, one question arises for teaching. How can an individual (~~know when to shift~~) from one "front" to the other? Is it not asking too much of us to move from one form of existence to the next at the (~~right moment~~) always? What is the indication for a shift? Must we not specialize? Or go to pieces? Fortunately, a subtle warning tells us, at any one "front" when we should stop. Any desire ends when it is fulfilled, or the desire becomes a vice. We enter every one form of life through one door, and we are dismissed by an exit when it is enough. The body knows when we have eaten enough. The powers of speech have their own knowledge, too. Joy asks for expression. But grievances, and sorrow chase us out of our paradise of feeling and playing with out feelings. A child enjoys playing. Then, it hurts itself or its toy. It begins to cry. And now, some rationalization, or a story or a new imperative, must comfort the child. Either the leg of the chair which hurts, is made the scapegoat. We were asked, in my youth, to beat the wicked chair when we had hit it. Whatever we do to comfort the child, we move it to another "front". The same applies to the other "fronts". The past is told because our loyalty and reverence is awakened. When this reverence is exhausted and boredom sets in, we turn from history. Contempt for the past is another name for this healthy revulsion from the past. And we proceed to action. The Imperative of love is superseded by (hatred) when love is disappointed. Hate is a subtle way of keeping us from a possible wrong path into the future. (Schiller hated Goethe) before the time had come where he could love him as his equal. The most difficult problem may seem the point of saturation for rationalization and knowledge. When should we stop our (indicative) our brutal statements of fact? I am inclined to think that this moment presents itself whenever there is danger that reason may uproot our loyalties, throttle our feelings, choke our power of loving. We all must be "knowing" in a conscious equilibrium of our powers of feeling, of being loyal and of changing the world. I think that the word "conscience" expresses the exit door from mere reasoning. Conscience is not to be mistaken for consciousness. Conscious we are on all four fronts. But when scientific detachment goes too far, when we have analyzed our parents, our friends, our wife, ourselves, we definitely feel that there would be a danger in going on endlessly with the analysis, and that we must keep loyalties, love and emotions, despite all our cleverness. This specific function of conscience seems to me worthy of regeneration and cultivation, in teaching. The teacher must stop his analysis when he no longer can be sure of his students' power to move to other "fronts", unhurt, when the other forms of his incarnation could cease to function.

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This leads to a last remark, about logic. We have placed the logical process in the interval between the eye and the hand, as the form of classifying an object and (defining) it. In the light of the four "front" principle, the function of logic may be understood even more accurately now. We have already suggested that mere reasoning is that attitude in which things seen by the eye, are defined and classified, before our technical manipulation of the objects thus observed can start. By reasoning, the individual, and by science, united mankind digests impressions from the outside before acting upon them. The mind is the best mirror of the natural environment, when it eliminates all other qualities of word and speech except what the object itself conveys, as an extension in space.

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The center of this process by which things look at us definitely, is the syllogism. In it, logic celebrates its triumph: "All men are mortal. Caesar is a man. Therefore, Caesar is mortal." This figure of thought, and speech as well, is the great discovery of Aristotle. If, in the syllogism, the logical "front" were completely self-supporting, and if the universe talked to us in this reasonable form, without borrowing from other "fronts", logic could continue to neglect lyrical, historical and creative truths. The logicians could shrug their shoulders as they now do; admit that these ways of speech exist, but maintain that they are separated from their own subject matter, reason. Now, our whole attitude has been that, although the situation at every "front" is interesting enough, we should concentrate today on the interplay between all "fronts".

And I have to make the suggestion that the syllogism, which the logicians seem to monopolize, really owes its value to the fact that truth from other "fronts" is carried to the outer "front", and here

it is equalized with other truth. A poet has called the brain the tool of equalization, the great equalizer. We have already used the example of "the Ego", where it took thousands of years to carry the emotional subject over to the neutral and indicatival "front" of objects. This carrying over from another "front" is true about Caesar, too. The historical humanity of Caesar is not experienced on the outer "front". Because on the outer "front", nothing really unique and incomparable can be observed. By definition, all objects have something in common. As objects they have one denominator, as belonging to a class, as being capable of definition. Defined things are part of matter, of the corporeal world. The subsumption of Caesar under the major proposition of all men are mortal, drags an experience from the historical narrative into the jurisdiction of the external power of thought. Aristotle himself in his text on a syllogism speaks of a horse that is white, whereas others are not. Now, "white" and "horse", as first discoveries of man, were fraught with poetical intuition and historical importance. All things in the world, when they got names, were still treated as living companions of man. The names themselves, "forget me not" and "pansies" prove that a name is not a definition, and that it is given by a different energy within us. Giving of names requires the faculties opposite to those required of a man who defines scientifically and who classifies. Every linguist knows this. The syllogism must deal with objects that already have names. These objects got their names, when they were man's companions, or aims or symbols of experienced history, like trophies, totems, fetishes, etc. Hence the syllogistic "front" is the last in the process. Just as man, when he dies, becomes an object lesson, and is talked of as "he" -- nobody can speak of me as "he" in my living presence, -- so the logical "front" is the last phase of our dealing with the (universe). When we detach ourselves from things that have moved us, shared our lives, determined our course, then we analyze them and bury them by our definition: "Just something like anything else," we say, "just this genus with the specific difference." And the syllogism applies to it the general standards of this class of things.

A syllogism then, comes to those parts of the universe which have ceased to be anything but objects, but which have been something else before! Man must pass through more than one phase of his dealing with the world before he can rationalize it. Time must elapse and time must have been devoted to man's relation to certain matter, before that matter can be turned into mere matter. As physics is the last and ultimate abstraction from our life in the world, so the syllogism is a last abstraction. Neither Caesar, nor mortality, nor what "all men" means, can come to me on the external "front". The externalization, however, helps me to get these things out of my system. As the atheist said to the minister to whom he brought his son for religious instruction: "Don't be surprised, I shall remain an atheist. But the boy must get something from you to rationalize upon." Here, the minister represented the three other moods of human understanding.

Our treatment of grammar as a biological and social science of grouping may seem new in this country. It has, however, a considerable historical background. Johann Georg Herder, and Hamann, sponsored it first. Later, Ludwig Feuerbach made it the cornerstone of his philosophy. In our days, after my first launching of the subject in 1912, a group of "Sprachdenker" has come forth, Max Ebner, Franz Rosenzweig, Martin Buber, Rudolf Ehrenberg. In philology, men like Schuchardt come rather close to our viewpoint; only they are frustrated by departmentalism. On the other hand, I have not complicated this introduction into the grammar of society by showing you the future problems of this science. My mentioning a later investigation of the emotional mood of expression, may serve as one example of the many others to be solved. For I have had to formulate the questions in not wholly technical language. I should have modified my phrasing of the "we", and the "I" problem, for instance. As it stands, I hope it suggests the truth that a special grammatical person is connected with a special mood. It certainly is not exhaustive. Today, I have consciously subordinated everything to the one task of showing you man's unity under the forms of his appearance in the world of time and space. We must approach man by four different methods to understand who he is.

And that is the central truth in all this. The past, the future, and the two "fronts" into which the present breaks apart, outer and inner, under the pressure from future and past, are the four dimensions of reality. If the mathematicians should insist that space has three dimensions, we would have to add two more dimensions to our four. And talk of a sixth sense, perhaps would be justified by recognizing six dimensions, three in time, and three in space. One thing is certain, the so-called three dimensions of space, are of less importance, for the science of life, than the discrimination of future, past, and present. For, it is only when we rediscover the present as splitting into external and internal under the pressure of past and future, that we open the path into the external space of physics and mathematics and nature, with three dimensions of its own. The space of physics is a posteriori, with life left out.

Because human life is (enlightened by speech) in four different moods, recording the past, summoning and prophesying the future, expanding the inner, visualizing the outer, (no human act is void of language.) We speak, when we see, listen, remember and command. The fact that speech, when we see, is directed towards ourselves in the form of thought, does not destroy the unity of all language, including thought. A sentence is always a (decisive) phase within the act of living. The acts of life are not complete without the corresponding, preceding or following, or expressive or imposing linguistic effort.

The metabolism of life permeates these four efforts; the imperative is the seed; the expressive is the blossom; the historical is the fruit; the logical is the burial of our social (evaluations.) Grammar is the science of the life and death of society.

Reason has called its own movement of the last centuries, the Enlightenment. Reason is not the light. It is one form of light. Reason is that form which the light takes when we use it for exploring the encircling gloom of external darkness, in search of these things which have left us and our own system and remain outside. In the name of the light, this period of the Enlightenment must be ended. As mere enlightenment, it prevents the light from shining backward and forward and inward as well as outward. In the name of the light, let us go beyond enlightenment. In the name of the cross of reality let us cultivate the conscience of the teacher which counter-balances science. Respect the Exit from the process of knowing, because man must not be made childish, uprooted and a fool. And let us go beyond the logic of the syllogism. Six thousand years of grammar back us up when we recognize that man never speaks in one form only; as a fighting, historical, feeling, and growing carrier of life, he is called forth, elated, recorded and defined by that (one organizer of United Mankind,) -- by language, logic, literature.

January, 1939.

Cabot Lecture

I. Introduction.

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The aim of the following three lectures differs from that of the six that came in October and November of '38. In order to understand the difference, let us formulate the topic of the old once more.

Our concern is with the future of the university. An end of an era is apparent; not from theory or dogma, but as the story of the end of the German university. At its grave, it is easy to see the end of the second successful form of a university: that of philosophy, with the Ph.D., the doctor of philosophy, as its German symbol. This quickens our understanding of the parallel with the scholastic university from 1140 to 1500 which had been dominated by the doctors of theology and law. The Scholastics had conquered eternity, the philosophers space. In our times, the university is integrating from within. But the scientists no longer understand each other. Science has lost direction and discipline. Hence, in raising the question of a future for these huge locomotives of higher learning like Harvard, we have, for the first time in the history of any university to inquire in the meaning of future. Just what constitutes future, or past, or present? And if the university is going to have any future, which in every particular case may seem very doubtful owing to sheer inertia, it will have to be based upon a new creative idea about the times of men in society, about the reproduction of genuine future, genuine present and genuine past, in a world of space-abstractions.

The dictators have created a new type of socialised learning dictatorially. This is discipline. Discipline it is, too, to put St. Thomas in the centre at Chicago or at St. John's. Only, it is discipline from without. Can discipline be a result of an inner evolution of the university? We have analysed the temporal significance of parents, of scientific research, untrained youth, and administrators. A lawful order unfolds itself in their reciprocal relations when the new yardstick of grammatical tense is applied. They all are indispensable. Parents, students, teachers represent different but interdependent periods of life. The power vested in the administration, as in any governing body, is the power to decide between future and past. The uncreative character of the administration, and the moral significance of power, both are clear. perhaps the place of any body of knowledge as ambassador of the future was the greatest surprise of the analysis.

Contradicting interests reveal themselves as intrinsically dependent on each other; only together can they reach the density of the real which we approximate when more than one time or grammatical tense is embodied and incarnated simultaneously. The problem of peace between men of different age, class, origin, and date, reveals itself as one of co-existence in space despite difference of time. This paradox is solved because the temporal being, man, passes through attitudes which open him to other temporal beings in various ways. Passing through the grammatical attitudes of you (=addressee), I (as taking possession), we (as communicating), it and they (as object lesson) man receives and asserts himself and impresses others in everything he undertakes during his life. Hence, one half of his energies is devoted to organizing co-existence with others of older or younger social rank. Fortunately, we are better equipped with coping with others of older or younger social date than for pacifying our true contemporaries; our mental outfit allows for peace with ancestors and progeny much more easily than with contemporaries with whom we are usually at war. Language reveals itself as social organizer. In deciphering language we decipher the constitution for educating free human beings.

After that, we drew up plans for students, fellows and masters, based on their functions in time. In the fifth lecture, we sketched the college that would begin with the problem of hunger, i.e. of making students hungry, that would offer common experience where today every boy has only private experiences

and that would lead to the selection of every class's and individual's responsibility. The introductory course, we characterized as the final perversion of the obsolete but victorious type of university training. Selective power, we acclaimed as the educational goal of the future. Today, with selection destroyed, the colleges follow every political fashion because they are the slaves of any content that enters their mind.

I suppose that many of you would like to discuss this new college further. Nothing is more delicious than to set huge problems revolving without assuming any immediate responsibility. And I know that some of you still expect me to go on discussing what other people should do. It is my obligation to ask the question: for what possible future institution we should prepare ourselves. The answer cannot end with describing the new institution; it ends with taking the first steps of preparing ourselves in the new direction. ~~A responsible answer to a social problem always transforms an abstract question into a concrete act.~~ And since life is endless, at least the first step, the first concrete act must be included in the answer, as a minimum requirement to show that we mean it.

Therefore, I gave it in writing at the outset that the January lectures would deal with our own change of mind. I am intending to criticize my own and your own habits of thought which make us unable to teach in the new institution. Before any parents, administrators or students can be canvassed, the scientist, teacher and scholar must re-establish his consciousness that he is the representative of the future. Any other attitude would be dictatorship in education. To think of other people's education is one thing; to leave my own ruts of thought in my own field, is quite another. Either, we are part of the people who are changed, or we have no right to change others. Endowing colleges with ideas is as dictatorial as endowing them with money as long as the endowing group stays unregenerated behind. Therefore, I should feel that I was wasting our best opportunity if I satisfied your curiosity about the finances and the work of the future college. I am one, you are forty. Don't you think that forty-one people who have done some preparatory work themselves can answer these practical questions much more intelligently than I could at this moment?

As soon as we begin to look at our world, at our society, at our research, at our science and teaching in terms of the grammar of time, the rest will follow. Have you begun, during the last months to do other things, to use other ways of thinking than those habitual for you before? This is the only thing that matters. Instead of discussing the college, please imagine yourself in charge of one of the groups of twenty-five, or one of the classes through four years, as a master. In order to do an effective job, you would have to go over your own field of knowledge and your own experience with new interest, new criticism, new power of discrimination and selection.

You would have to ask: What do I offer as an expert of this or that kind? What do I offer as an American in America? What do I offer as a member of the human race? We are teachers with a new situation before us. Instead naively acting as hired men, or instead of expecting the student to think as we think, we are aware of the time difference and the perpetual change from one commandment of education to the next in us and in our students. What does any lady do when she meets new people and a new situation? She uses some art. We too in preparing ourselves for an unheard of situation should use some art. Let us try a new kind of lipstick. To seal our lips for the arbitrary, deadlocked, unsifted thought of confusion, to unseal our lips for fertile, fruitbearing and indispensable thought, is our preparation.

Three times we must seal and unseal our lips because as carriers of the mental future we have to speak in three different ways: we have to instruct in our own field, we have to teach in our own society and we have to leave the path open into the final society of all man. These three futures are parts of that future which anybody must represent simply by opening his mouth and speaking. These three approaches are the topic of the following three lectures. These approaches will have to be treated summarily. The conditions under which we meet, here are only half real. We have not gotten the new college. We are not the appointed staff of this new college. We, you and I, are going through the motions voluntarily. And we must compress

into three evenings the compass of efforts which we all should sustain over a long time. This reflects on the lectures. They are headlines for a year of preparing for the professorship of the future. They are anticipating the time when the scandalous manner in which people are frustrated for teaching today by the existing lack of system, will be superseded. As compressed food, they will be less attractive than the omelettes and soufflés of intimate study might be.

Three directions have to be redirected incessantly by a conscientious scientist, a conscientious citizen, a conscientious educator: his direction toward the development of his science, towards the development of his community, towards the development of men. To our fellow scientists, to our students, to historical society at large, we owe allegiance and change.

The first evening will deal with the scientist's usual temptation: he is so close to the so-called progress in his own field that he overlooks the dangers of a vicious circle. His naive faith in the progress of his science must be verified in the light of a diagnosis which asks: what is the place of my science among the sciences? Where do I stand with my allegedly independent science in a hierarchy of sciences which is already dust and ashes? We shall see in the example of physics and classics how the most remote elements of knowledge actually live and die together.

Our second headline runs: How to speak to our students? It does not depend on us what we may say or how we may reach their ear. A healthy human being must hear different idioms of speech in order to listen to any one of them effectively. The variety of ways that must reach a human being's ear, brain, and heart, has been overlooked so long that the scientist and teacher cannot instruct today because the other, supplementary overtones are not voiced. Language, logic, literature, is putting our activity in its place within society.

Finally, it is obvious that our society lives as a group among other groups. A university must think in terms of unity of groups with different creeds, leaders, climates, and r Today, the university simply ignores this multiformity.

We shall attempt three diagnoses: Diagnosis of a science within the scientific world.

Diagnosis of teaching in the national world.

Diagnosis of educating in the world-wide world.

End of Introduction.

The Luther of Physics = Lecture 7

Diagnosis of Research or The Redirection of scientific problems.

Luther and Paracelsus, Appraisal of analogies. Primary and secondary inspiration. Einstein. Nature. Why it is becoming an untenable concept today. Primary and secondary importance of a science. Planck. The struggle for life within a science. The problem of a plurality of schools. Progress or vicious circle? The history of literary criticism. The cycle of Biblical criticism. The uprooting of the classics (Erasmus von Rotterdam and Nietzsche.). The discovery of the unnatural. The denaturalization of the mind in history. Professor Lawrence Henderson and nature with a capital N. Leonardo da Vinci's definition of nature. The first independent landscape, August 2, 1473. Background and foreground.

announcement of the evening. It is, perhaps, as good as any spicy kind of advertising. It sounds like a slogan. I shall try to use this slogan seriously. I wish to demonstrate that we cannot help employing analogies and comparisons of this sort when we wish to diagnose a science. But we can not abide by the analogy. Today, one half of mankind uses analogies. And the other half despises them; the experts label them 'unscientific'. Both groups seem to be unaware of this process by which we become aware of the significance of other human beings. And the experts, because they decline to use analogies, are unable ever to understand the significance of people. The man in the street who uses analogies, is unable to defend himself against wrong analogies.

'Luther of Physics' is a mere pun, at the outset. All speech is punning at the beginning, and it only becomes serious when we keep going. Words are like worms for a fishing rod, at first. Put on the rod, they may begin to catch. Let us not despise analogies, and metaphors as unscientific. They are our only means of discovering the truth although the worm without the fishing rod would not work. An automobile in the nineties was built in analogy to the buggy. Otherwise, we never would have gotten the automobile. Analogies are the beginning of wisdom, not the end. The cleverness of the logician refuses to embark on the longwinded process from analogy to reality. Let us try to attain sophistication through ingenuity.

Some of you may remember my booklet on Paracelsus. You were asked to read it, with this lecture in view. You will kindly turn to his place in science once more. He was called, by his enemies, the Luther of medicine. It was meant as an insult. It degraded Paracelsus into an imitator of Luther. Hohenheim was disgruntled. He exclaimed: "Let Luther do his work, and let me do mine. We have nothing in common." Without wishing to make things more difficult for the persecuted Luther, he made it clear that his place was quite another. Every science may have its Luther but it also has its Paracelsus; and so, we already have two different stages of a science; when you now look back to Faraday, in my booklet, you have the classic, the founder, and the Luther.

Three phases may suffice to determine the direction of a science. Luther made possible the predominance of philosophy for the following era because he eliminated from theology all the worldly elements. The whole visible world, through Luther's iconoclasm of Pope and clergy, became one world again. There no longer subsisted any sacred cow, any white sepulchre, any Holy See in space that was exempt from the laws of space. Luther smashed the clerical tabernacle of theology, and tried to keep the kernel: Bible, faith, theology, stark-naked. Tearing down walls, shells, relics, and all the historical superstructure of 1500 years, he went down to fundamentals. He thought of himself as a second St. Paul. All this helped us to understand the role of Luther's university in Germany. At this juncture of our survey, it is useful to analyse his place in his own science: theology. What is the outstanding feature of his theology? That it is the property of all men, that it is universally understood without the existence of a universal staff of doctors. Luther throws out the clergy whose theology had grown through the ages, and kept the theology without the fellowship of the catholic hierarchy. The solitude of the individual opened up to fundamental truth directly, in a completely be-nighted world. Opposite to Luther, Paracelsus threw out the very fundamentals of medicine, its classical doctrine of the four humours and kept the empirical details of later periods. Paracelsus, then, did the very opposite from what the Reformation tried to do. He did not shout for a Bible without a church as Luther did. He asked the medical profession to have their Bible written as it had never been written before. He tried to convert the clergy and profession of medicine to the new Bible of empirical research. No, he was not the Luther of medicine. He was not a reformer but a creator; a beginner, not a purifier, a founder not a repairer.

Luther was not a creator; he was a reformer. His negative aspect was what counted in the long run. Power, courage, faith, vigour, were in Luther abundantly. But he moved in the historical groove of religious thought. Whereas, Paracelsus moved in a new area of thought. Hence, we have to distinguish primary and secondary inspiration; and Luther is moved by secondary, Hohenheim by primary inspiration. This is not putting any blame on Luther. It is a statement of fact which he would have been the first to acknowledge.

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. That is the reason for Luther's eloquence and articulatedness. He simply translated the Bible once more. The whole story of the Reformation is the new translation of the Bible for everybody's use, with immediate success. Hohenheim, on the other hand, began to speak a new language, a new idiom never heard before, and quite inaudible for a long time.

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 a final form but as the free 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. Now, we can understand, why, with the Reformation, religion ceased to be of primary vitality in Europe. Everybody knows that Luther exalted the secular state. Everybody knows that secular art, politics, thinking, took the place in human consciousness which, before, church and saints had occupied. How was it possible that the reformer of the church could prevent religion from keeping man's primary energies of attention and consciousness any longer? Why did Luther enable man to let religion drop out of his daily professional activities and give now all his conscious efforts to his work in the world? Because the reform meant, in fact, that religion was made over into a functioning process. Universalizing priesthood, universalizing theology, dispersed these energies through all mankind, and detracted the universal attention from the explicit organs of producing theology and priesthood. Religion, after Luther, was allowed to function in a secondary process. It may be added that Luther stopped the creative phase in theology after 300 to 400 years. As he knew quite well, and we know definitely, Luther's reform did not go against more than the last four hundred years of the church with the scholastic theology and canon law. His task was not to be a second St. Paul, but to cancel out the work of the schoolmen.

This is of some interest when we now turn to physics. Physics not much more than 400 years old. And it would seem awkward to compare physics today with theology in 1517, if Luther had reformed 1500 years, of conscious religious life. On the other hand, Luther only abandoned the theology of Abailardus, Thomas, Scotus and Cusanus, he only reformed three hundred and fifty years of occidental thought. So it becomes less absurd to try our analogy on the Luther of physics, on Albert Einstein.

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

** Trattato della Pittura, Parte Prima.

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 baldest assumption man can make. "Nothing" is not given in experience. Zero is a pure abstraction 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 depreciates. 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.

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 Efeld'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. 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, by a general science called philosophy, the science natura 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.

As soon as you are just one group conforming to a standard, like books, 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, 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.

As 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.

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, as we saw in our fourth lecture. 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 organised 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.

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

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always have said that two and two make four, and that they never allowed witches or ghosts to take part in their procedures. I can prove that physics has lost its place at the centre of the scientific universe. 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 still 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 class. 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 Quanta. Planck seems to suffer from 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. Hohenheim not Luther had creative ideas. 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 one 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.

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

nobody
 labour was divided, . . . 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 thoughts of school. 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. In the famous correspondence between Dilthey and Count York von Warburg, the latter exclaims: "the last three hundred years are one main melody: mechanics." 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 his 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.

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 philosophy, discovered the natural world, which preceded Christianity, as the classical world. The natural world was infinite like God. The nature of the Greeks was perfect like Christianity. 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, Moellendorff 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. 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 idea of finding the purer and more natural Christianity among them. 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.

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, rediscovered 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 Ehrenburg). 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.

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 loop-

hole 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 knew that Nature was "better" than Revelation.

We learn, and teach others, that 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.~~

For that reason, our second lecture will deal with the unnaturalness of logic, language, literature. The line was drawn, in 1599, between God, Church, Bible, theology = Revelation on one side, and World, Man, Classics, Language, Mathematics = Nature, on the other. Our new line will cut in between dead and living matter. And this is the decision, the cut which you have to make or to lose your 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.

As an illustration of this decisive character of the choice, an Argentine philosopher comes to my mind. He was the first man from the Argentine to study philosophy at Columbia University. His thesis was a dirge on the denaturalisation of the mind in history. Alexander A. Jascavevich, in 1936, showed that, for Aristotle, the human mind had been part and parcel of the cosmos, of the physical world. From there on, humanity has been slipping; the mind has become de-naturalized. Augustine, first, bereaved the world of time and space for the human soul. The soul was not in space, although she was supposed to be fleeting through changeable time. Finally, one of the fathers of modern physics, Descartes removed the mind from time and space. The world of physics and the world of the mind are opposed. Now Jascavevich writes: "the mind acquired meaning and value in logic, not in nature. And in this estrangement from nature, we have a rationalism that makes naturalism impossible." Poor Aristotle, poor Jascavevich. It will be worse yet. 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", really an excellent formula, is a compliment to Augustine and Descartes. It shows that we shall denaturalize man

and more completely, to save him from decay, to save his life, his society, his humanity. 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 they are unbridled victors today, with their black and white magic of the education racket, sterilization, drugs, surgical operations, etc. etc. I am not speaking of the central scientific movement, but of the orgies performed in its suburbs, like psychology, or modern fiction. Aldous Huxley is one of the martyrs of this victory of the witches over the soul of man.

of Huxley's generation
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 statures. 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 Quetzalcoatl 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 proceeding from the man-made idol 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 numerus 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 his 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. In our third lecture, we shall see exactly what has been done and how it has been done.

In the meantime, let us study those attributes which are expressions of this lack of entropism and naturalism: language, logic, literature. On the other hand, let us continue, by all means, to speak of the nature of things

*Pareto is an Italo-French Naturalist who tried to exercise the art of reductionism to the finish by calling all higher aims of man residues, that is, relics of former stages.

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.

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. 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 platy 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 his 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 deathknell of progress in physics. The background may seem to 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. This equals 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. In our next lecture, we must find out how foreground is created, in detail. One thing is certain: The background has a foreground whenever an actor has the courage to come out of the wings, to overcome his stagefright, 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.

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