

THOUGHT AND LANGUAGE

WHILE dictionaries are necessary to get at the bare bones of meaning, they give little light on the vital flow of a writer's intention, and may even get in the way. The dictionary definition supplies but the content of words in their "limestone condition," to borrow Emerson's estimate of writers who are unable to make words take flight to higher levels of meaning. If you stay with dictionary definitions, you must play the game with only the moves of pawns. It was Samuel Johnson, George Whalley tells us, who first sensed the poverty of ordinary lexicographic method, and began in his dictionary to give "examples of the actual use of a word in its various uses and shades of implication." And see what Thoreau says of Carlyle:

Nature is ransacked, and all the resorts and purlieus of humanity are taxed, to furnish the fittest symbol for his thought. He does not go to the dictionary, but to the word-manufactory itself, and has made endless work for the lexicographers. Yes, he has the same English for his mother-tongue that you have, but with him it is no dumb, muttering, mumbling faculty, concealing the thoughts, but a keen, unwearied, resistless weapon. He has such command of it as neither you nor I have; and it would be well for any who have a lost horse to advertise, or a town-meeting warrant, or a sermon, or a letter to write, to study this universal letter-writer, for he knows more than the grammar or the dictionary.

How shall we read the soaring imagination of a writer? Can he be depended upon? Who, after all, can verify flashes of insight, or test the validity of poetic vision? We cannot drag down the Over-Soul from its encircling heights to measure the dimensions, calibrate its candle power, or get the coefficients of its spiritual potency into a handbook for use by beginners. "In poetry as in life," Rilke said, "there are no classes for beginners; we are all expected to do the most difficult things first." Yet the Over-Soul, whether of Emerson or some other inspired writer, is never

a wholly original idea. It belongs to that great family of conceptions which are known by their deep resemblance to one another. But still there is the question, can we *know* that the Over-Soul exists? Does it supply a celestial ichor that flows in our transcendental arteries and veins?

Such thoughts easily become intoxicating, and it may seem best to put a stop to them, but a prudent intellectuality has never prevented these ideas from bubbling up like fresh Pierian springs, giving wide and ennobling horizons to civilization. The question is rather, should we deny or ignore such spectacular possibilities only because we cannot classify them, fit them into some biologically based doctrine, or make them subservient to the categories of social psychology? A Cartesian devotion to neatness and certainty makes us say that there is physics, and there is metaphysics, and the two must never be mixed or we shall be lost in hopeless confusion. But first we should ask if the two have ever been successfully separated. Or whether, when we try to think with words devoid of resonance, and stripped of all ambiguity, the weight of the lifeless language that results will drag our thoughts below the level of anything worth knowing or saying.

What happens when we read a Carlyle—or, more pertinently today, a Thoreau? It often happens that he wins us before we wholly understand him. His lightning precedes the spelling out of meaning. The illumination comes before the persuasion. And so it is with some few other writers. There is nothing in the syntactic analysis of a man's prose to help us here. A leading intuition is the guide in such acceptances; and we can say at least this, although leaving the matter at so inconclusive a juncture would be careless practice. But here another, hardly recognizable, science is involved. The research does not go out, but in. "I read," said A.E., "for

sentences which come out of a deep life. I brood upon a sentence rather than upon a book, carrying it away in my mind until I have realized all its implications, spiritual and psychic and material, until in fact I have come to some kind of glowing realization of spiritual life or law which was implicit in the sentence." He did not go to reference works or submit the sentences to scholars, but dwelt upon them, turning his mind into a polyglot interpreter of all the meanings and possibilities in what he had read, until it was no more something read, but a finding of his own. No secondhand truth for him, no hand-me-downs of religion or philosophy.

It seems not only reasonable, but necessary, that there be an order of knowing which has no other means of verification—which finds its confirmation in the exquisitely individual responses of minds that trust only the solitary path of independent reflection, yet which lead, paradoxically, as if by chance, to a delicately tuned harmony or even a unison.

To say that a classic is a work that is "contemporary in any age" is to affirm that there are at least two levels of cognition in human beings—levels to which different rules or laws apply. In one of the finest passages in all his writings—the opening paragraphs of *History as a System*—Ortega remarks that the admirable qualities of science are contrived at the cost of remaining on a plane of secondary problems, "leaving intact the ultimate and decisive questions." It is well enough to cherish exactitude, to admire precise measurement, to hold it important, in building things, to exercise perfection of control. But what of the enterprises in which other excellences are paramount, achieved by subtler methods? When A.E. says he studies only "sentences," not "books," he does not mean that he ignores the flowing impact of a paragraph or passage. He is conveying a *general sense* of how he goes at thinking, and no precise counting is required. We take his meaning. He does not swallow libraries, but ruminates, slowly

extracting essences, performing private metabolic experiments on the nourishment obtained. The sweep of a thought needs no anemometer to measure the velocity of its breeze. The currency of the poet is not in any cash register.

Again, Ortega:

It is the task of physics to ascertain for each fact occurring here and now its principle, that is to say the preceding fact that causes it. But this principle in its turn has a principle, and so down to a first original principle. The physicist refrains from searching for first principles, and he does well. But, as I said the man lodged in each physicist does not resign himself. Whether he likes it or not, his mind is drawn towards the last enigmatic cause of the universe. And it is natural that it should be thus. For living means dealing with the world, turning to it, acting in it, being occupied with it. That is why man is practically unable, for psychological reasons, to do without all-round knowledge of the world, without an integral idea of the universe. Crude or refined, with our consent or without it, such a trans-scientific picture of the world will settle in the mind of each of us, ruling our lives more effectively than scientific truth.

So there are these two ways of thinking, and inevitably we do both. We ought, common sense suggests, to try to do both well, but the surface securities of an unambiguous, countable world often make us say, "I will do one kind of thinking well, and shut out the speculations of metaphysics, which are only a kind of poetry with no certainty in it." The situation is not helped by opposite declarations from those who imagine that speaking "from the heart" puts an end to the need for rigor. The heart has its own precisions, ignored by the easy decision to "think spiritual thoughts," which should be enough, "since spirit rules all." Actually, the "spirituality" of the present is so loosely permissive that one might think "discipline" is necessary only to technical and material undertakings, without connection with the higher reaches of aspiration. Plotinus never suggested this, nor any Eastern sage, and a careful tracing of ancient ideas concerning spiritual knowledge suggests that the idea of

discipline as a means to truth had its origin in sacred tradition.

"Whether he likes it or not, his mind is drawn toward the last enigmatic cause of the universe." We do not *know* the last enigmatic cause, but a tropism as strong as the hunger of roots for water, of plants for sunlight, makes us seek this principle. There may be veils which hide its meaning, but we struggle to lift them, even though knowing there must be—"Veil upon veil behind." An entire mystical literature is concerned with this irrepressible longing, once spoken of in the West as the search for the Holy Grail. What is the Grail? Does one seek it, or should he rather make himself ready to receive it? Can its presence be invoked or called up, and is this the way, instead of unguided wanderings? How are enigmas unravelled? By, perhaps, an inner feeling for the fitness of a particular way of life? Can a man take simple instruction in these things or are there only dark sayings? What about the charts for "journeys to the East" that people offer for sale?

First in importance, surely, is being able to distinguish between the two ways of knowing. In the terms of one way, Shakespeare's finding of "sermons in stones" is utter nonsense; in the other, it might become the seminal beginning of a higher encyclopedia of meaning, the composition of which is a dialogue between man and nature, directly pursued. "The greatest delight which the fields and roads minister," Emerson said, "is the suggestion of an occult relation between man and the vegetable."

In *Small Is Beautiful*, E. F. Schumacher remarks (in a chapter on Education):

How could for instance a knowledge of the Second Law of Thermodynamics help us [to live a good life]? Lord Snow tells us that when educated people deplore the "illiteracy of scientists" he sometimes asks "How many of them could describe the Second Law of Thermodynamics?" The response he reports, is cold and negative. "Yet," he says, "I was asking something which is the scientific equivalent of: 'Have you read a work of Shakespeare's?'" Such a statement challenges the

entire basis of our civilization. What matters is the toolbox of ideas with which, by which, through which, we experience and interpret the world. The Second Law of Thermodynamics is nothing more than a working hypothesis suitable for various types of scientific research. On the other hand—a work by Shakespeare: teeming with the most vital ideas about the *inner* development of man, showing the whole grandeur and misery of human existence. How could these two be equivalent? What do I miss, as a human being, if I never have heard of the Second Law of Thermodynamics? The answer is: Nothing. And what do I miss by not knowing Shakespeare? Unless I get my understanding from another source, I simply miss my life. Shall we tell our children that one thing is as good as another—here a bit of knowledge of physics, and there a bit of knowledge of literature? If we do so, the sins of the fathers will be visited on the children unto the third and fourth generation, because that normally is the time it takes from the birth of an idea to its full maturity when it fills the minds of a new generation and makes them think *by it*.

In a note to this passage, Mr. Schumacher gives two versions of the second law of thermodynamics, one from the physicists, the other from Shakespeare:

. . . the Second Law of Thermodynamics states that heat cannot of itself pass from a colder to a hotter body, or, more vulgarly, that "You cannot warm yourself on something that is colder than you"—a familiar though not very inspiring idea which has been quite illegitimately extended to the pseudoscientific notion that the universe must necessarily end in a kind of "heat-death" when all temperature differences will have ceased.

"Out, out brief candle!
Life's but a walking shadow; a poor player
That struts and frets his hour upon the stage
And then is heard no more, it is a tale
Told by an idiot, full of sound and fury,
Signifying nothing."

Mr. Schumacher has another passage on the ideas about meaning which men hold—the ideas which are typical of our time. If the ideas enable a man to make only pawn moves with his mind, he dwarfs his thought and diminishes his existence. Here Schumacher speaks of ideas about ourselves, about the world, and what is happening in the world:

If they are mainly small, weak, superficial, and incoherent life will appear insipid, uninteresting, petty and chaotic. It is difficult to bear the resultant feeling of emptiness, and the vacuum of our minds may only too easily be filled by some big fantastic notion—political or otherwise—which suddenly seems to illuminate everything and to give meaning and purpose to our existence. It needs no emphasis that herein lies one of the greatest dangers of our time.

Tolstoy made a somewhat similar discovery and reported it in *My Confession*. It came over him that his cynical judgment of the world, his lack of zest, his sense of the pettiness and evil all about—that these feelings came from himself, and that he had then applied them to life, as though all this was done *to* him, when, actually, it was the other way around. He had read the world by his own light, according to his own image, and he saw the print of his thoughts and feelings there. Out of this realization Tolstoy made a great resolve and gained the strength to change his own life. "I saw that if I wanted to comprehend life and its meaning, I must live, not the life of a parasite, but the real life, and accept the meaning which real humanity has given to it, and blending with that life, verify it." This brief essay by Tolstoy has a great man's answer to puzzling questions. They are, of course, *his* answers, but others have grown answers of their own with Tolstoy's thinking for a seed.

Meanwhile, the present use of language reflects the thought of the age, and reveals most of all the impoverishment of ideas, even among those who want very much to create a better world. Speaking of the reaction against scientific mechanism and the "total denial of meaning and purpose of human existence on earth," Schumacher writes:

Fortunately, . . . the heart is often more intelligent than the mind and refuses to accept these ideas in their full weight. So the man is saved from despair, but landed in confusion. His fundamental convictions are confused; hence his actions, too, are confused and uncertain. If he would only allow the light of consciousness to fall on the centre and face the question of his fundamental convictions, he could

create order where there is disorder. That would "educate" him, in the sense of leading him out of the darkness of his metaphysical confusion.

The spoken language of the young exhibits symptoms of the confusion of which Schumacher speaks. In the current *Structurist* (University of Saskatchewan, Saskatoon, Canada), George Whalley observes:

I have noticed that one of the earmarks of the "committed" young is a habit of speaking indistinctly, an insistent but pretentious use of key-terms that they seem to associate with the eternal verities, and a heavy reliance upon cant-terms which permit dazzling equivocation under the guise of logic. The nervous habit of interposing "like" and "yuh know" whenever linguistic invention flags is no doubt a convention of social significance, and probably the habit of tiresome reiteration and the refusal to engage in reasonable discourse comes straight out of some Maoist manual. As an identifying mannerism all this is probably no more irksome (to the washed and uncommitted) than the cheerful jargon of fighter pilots, computer experts, and racing-car buffs. But, although I am obviously exaggerating through generalization, I am disturbed that so much of it is utterly humorless and enervating. What I find much more disturbing is that this has become the standard speech of those who are trying, as perhaps no previous generation of young people has tried before, to see things straight and to get things clear.

To the various defenses offered for these unattractive tendencies, Mr. Whalley replies—

. . . that the alleged "breakdown" is not in language but in those who use language; that, however language is used elsewhere, in a university language can (and must) be used clearly and accurately, and that every effort will be made to help students to discover to themselves what it is they are trying to say; and that there is no better way of finding out how language works than by studying literature—"monuments of its own magnificence"—and by grappling patiently and fearlessly with whatever intellectual and emotional issues arise from such a study. I have found that the response (after a certain initial incredulity) is positive and enthusiastic; a new world—of self-discovery and self-affirmation, rather than of dreary "self-expression—begins to open to them, as though they were recovering their birthright. That such a procedure should be necessary with students who are carefully selected from the best

applicants, and who can be assumed to come mostly from "a good background," is a melancholy condemnation of both our educational methods and of the state of a society that purports (or presumes) to place a high priority on education and literacy.

Elsewhere Mr. Whalley speaks of the effects of the attempt to make human speech adaptable to computer methods, leading "toward an atomic analogy and an analytic technique." Lost by these efforts is "the holistic, synthesizing, symbolic nature of language itself." The broad effect of this emasculation of language is the mechanization of thought:

. . . as soon as we treat language as a phenomenon-to-be-observed we begin to lose touch with the actual and peculiar axioms of language and may find ourselves substituting causality for resonance, treating words as individually non-vectorial and devoid of intrinsic function (because the functions are complex, difficult to discern, and impossible to predict), or treating words and functions as "things" which, like data, are all of equal emphasis and worth, working for convenience to an assumed subject/object relation when in fact the relation is intersubjective.

In other words, such activities flatten out language and drain it of its noëtic aspect—the very power which enables minds to speak to minds, and vision to recreate vision. Mr. Whalley doses his discussion of the complex functions of language by quoting from Paul Valérie, who has written of the transforming power in the best of writing: "The force to bend the common word to unexpected ends without violating the 'time-honored forms,' the capture and subjection of things that are difficult to say, and above all the simultaneous management of syntax, harmony, and ideas (which is the problem of the purest poetry) are in my eyes the supreme objects of our art."

REVIEW OUT OF FIFTY YEARS

IF someone should ask, What is a civilized man?, we should probably offer Lewis Mumford as an example, adding the melancholy observation that not many such men are left, and Mumford, unfortunately, will be seventy-eight toward the end of the year. Illustrations, however, are not definitions. A civilized man, then, is one whose natural inclinations draw him to questions of human good and value, sooner or later, no matter what the subject under consideration. He is a man who by both nature and nurture insists on the expression of his humanity. We have been reading in Mumford's latest book, *Interpretations and Forecasts* (Harcourt Brace Jovanovitch, \$12.95), made up of selected essays from his work over a period of fifty years, and this quality of responding to experience in terms of human wholeness seems to govern every other tendency in Mumford's writing.

The book has sections on the roots of American culture, on influential figures in history, on the psychological conquest of modern man by the machine and machine thinking, and on the resulting "miscarriages of civilization," with finally a discussion of human prospects for the future. In this last portion, Mumford makes a musing comparison between the ancient town of Pompeii, buried under the ashes of Vesuvius in A.D. 79, and California towns of similar size and climate. Pompeii, by reason of its fate, is well preserved. It had about twenty-five thousand inhabitants who pursued "such an orderly and coherent and esthetically animated life that even in its ruined state it gives a less ruinous impression than the central areas of most American cities of ten times that population." The facilities for public use in Pompeii were more extensive, better designed, and far more generously conceived than the community features of much more wealthy American towns. The bread in Pompeii's bakeries was baked of fresh-ground flour, with no "additives" or substitutes, providing food of a

quality that all could have today, but few enjoy, because of the requirements of large-scale enterprise and long-distance transportation.

The comparison haunts the writer:

Every part of Pompeii was within walking distance, just as if its inhabitants enjoyed each other and wished to profit by each other's company. And the thousands of people who gathered to watch the games, or attend the theater, could leave their seats and reach home on foot before a similar American crowd could begin to get their cars out of a parking lot. In terms of biological vitality, in terms of social life, there is no question as to which kind of community could offer the best facilities and enjoyments for its inhabitants. Now, mind you, Pompeii was not a showpiece or an ideal community; far from it: it was just an ordinary Roman provincial town, so well designed that were it not for Vesuvius it might still be doing business on the same spot, within the same general pattern of life, as is so largely true today in the old Roman colonization towns, like Piacenza and Pavia.

The moral I draw from Pompeii is that we Americans must be spending our money on the wrong things if our towns are so poverty-stricken in civic facilities, so confused, and so ugly by contrast, in spite of all their boasted wealth and energy. What Pompeii spent on the vital contents of life, we spend on wasteful processing and meretricious packaging and phony publicity. Our trouble, then, is not merely that we have fallen in love with the machine, and have treated it as a god, to be flattered with prayers and propitiated by human sacrifices—more than 59,000 dead by motor car accidents every year: over three million injured, many of them maimed for life. (Latest 1972 figures.)

Our trouble is that we have ceased to respect ourselves, just as we have ceased to love our neighbors and want to be near them; we have ceased to cherish our own history and to enlarge our prospects, by promoting character and variety and beauty wherever we find it, whether in landscapes or in people. Because the machine, if left to its own special devices, money and power, goes in for standardization, mass production, automation, quantitative excesses, we have let our lives be governed by these same mechanical factors. So we constantly forget that all these capacities are beneficial only when they are at the disposal of a purposeful life that is itself more rich, complex varied, individualized, stimulating, and humanly

valuable something different from a machine's existence.

Americans are now in flight from what they have done and made, even from what they are, or have become, but the flight is not successful for two reasons: first, there are not enough places to go to that are still unspoiled, and, second, we take ourselves with us wherever we go.

Mr. Mumford's review of Ralph Nader's *Unsafe at Any Speed* and of *Safety Last* by O'Connell and Myers, which appeared in the *New York Review of Books*, makes it plain that we carry our ills with us in every effort to escape. He says:

In the interests of speed, the highway designers have steadily been taking away the visual pleasure and environmental stimulus of a long journey, and every other "improvement" conspires to the same end. The same compulsory high speed, the same wide monotonous road, producing the same hypnotic drowsiness, the same air-conditioned climate in the car, the same Howard Johnsons, the same clutter of parking lots, the same motels. No matter how fast he travels or how far he goes, the motorist never actually leaves home: indeed no effort is spared to eliminate variety in the landscape, and to make famous beauty spots by mountain or sea into as close a counterpart of the familiar shopping center as the original landscape will permit. In short, automobility has turned out to be the most static form of mobility that the mind of man has yet devised.

Commenting on the comparative indifference of car manufacturers to the safety of drivers and passengers, Mumford turns to the psychology of current sales promotion, showing that far more than safety is at issue in the American preoccupation with fast and showy automobiles:

As if to show their open contempt for the whole safety argument, the manufacturers have lately souped up their cars and their advertising slogans in order to appeal to the least safe group of motor car drivers, the newly licensed adolescents and the perpetual adolescents; and they have underlined their incitement to calculated recklessness by giving the cars the appropriate names, Thunderbirds, Wildcats, Tempests, Furies, to emphasize hell-bent power and aggressiveness, while their allies in the oil industry, for good measure, offer to place a "tiger in the tank."

Speed is the pep pill that the motor car manufacturers are now cannily offering to adolescents like any dope peddler; and since power and speed are both regarded as absolute goods by the worshippers of the Sacred Cow, both as good in themselves and as the surest way to expand the industry and maximize the profits, why should anyone suppose that any other human considerations will modify their homicidal incitements?

Perhaps the success of the European and Japanese cars in the American market will accomplish what human considerations are impotent to achieve. The revolt against the "Insolent Chariots" began quite a while ago, with publication of John Keats' book of that title, and the adolescents of today are much more inclined to smaller vehicles than they were when Mr. Mumford wrote in 1966. In fact, there may be the beginning of a general trend against bigness, or away from it, in the popularity of small automobiles. No one needs to be told about the intolerable evils of big cities, the domineering intrusiveness of big buildings, the unwieldiness and vulnerability of enormous cargo ships such as oil tankers. All these gargantuan monsters are out of scale with human life.

Mr. Mumford makes his diagnosis of a mass departure from living forms and functions:

The insolence of the Detroit chariotmakers and the masochistic submissiveness of the American consumer are symptoms of a larger disorder; a society that is no longer rooted in the complex realities of an organic and personal world; a society made in the image of machines, by machines, for machines; a society in which any form of delinquency or criminality may be practiced, from meretriciously designed motor cars or insufficiently tested wonder drugs to the wholesale distribution of narcotics and printed pornography, provided that the profits sufficiently justify their exploitation. If those remain the premises of the Great Society we shall never be out of danger—and never really alive.

From the beginning of his career, it has been Mumford's dream to see America shaped by Prosperos instead of Calibans, and his biographical articles are filled with understanding

of the possibilities to which our best men have pointed. He writes of Thoreau:

Thoreau seized the opportunity to consider what in its essentials a truly human life was, he sought, in Walden, to find out what degree of food, clothing, shelter, labor was necessary to sustain it. It was not animal hardihood or a merely tough physical regimen he was after; nor did he fancy, for all that he wrote in contempt of current civilization, that the condition of the woodcutter, the hunter, or the American Indian was in itself to be preferred. What he discovered was that people are so eager to get the ostentatious "necessaries" of a civil life that they lose the opportunity to profit by civilization itself: while their physical wants are complicated, their lives culturally, are not enriched in proportion, but are rather pauperized and bleached.

Of Whitman he said:

One could not become a sympathetic reader of Whitman without re-forming oneself into an approximation of this new shape. Only commonplace works of art reflect the everyday personality of the reader: the supreme works always show or hint of the new shape the reader may become: they are prophetic, formative. One might remove Longfellow without changing a single possibility of American life; had Whitman died in the cradle, however, the possibilities of American life would have been definitely impoverished. He created a new pattern of experience and character. The work he conceived still remains to be done: the America he evoked does not as yet exist.

In an essay on the "polytechnic creativity" of William Morris, he shows Morris' understanding of both the advantages and dangers of technology. Morris feared the day when men would be so preoccupied with machines that "it would take a machine worth a thousand pounds, a group of workmen, and a half a day's traveling, to do five shillings' worth of work." That day, Mumford remarks, has arrived, since "we now lack competent artisans or even fumbling handymen."

While this volume is filled with criticism, the reader is never depressed by Mumford, for his own buoyancy is the basis for everything he says. Never was a writer more attentive to his own advice: "To restore a human balance upset by our pathologically dehumanized technology, we must

foster human feeling, feeling as disciplined and refined, by constant application and correction, as our highest intellectual processes. To overcome the widespread sterilization of mind, we must unite a higher capacity for thought, to produce acts that will be worthy progeny of both parents."

COMMENTARY

LIFE IN LANGUAGE

WHAT George Whalley, an admirer of Coleridge, says in his long article in the *Structurist* so often bears on the point of this week's lead article that a bit more quotation from him seems desirable. On cultural regeneration:

Since universal literacy (in one sense) has inevitably produced universal illiteracy (in another sense), there seem to me few accomplishments more worth encouraging—wherever possible and by whatever means—than a fine sense of language. For a sense of language is no mere acquired accomplishment like flute-playing or skill in gymnastics, but a benign infection that can nourish us with intimations of our true nature and restore us, against the incursions of mechanism and manipulated power, to our birthright of sane humanity.

On where meaning comes from or is found:

I am not prepared to begin with the meanings of single words, but suggest rather that an *utterance* is the irreducible unit in meaningful language, and that every utterance is well regarded as an "I-speaking." To suppose that an utterance is the sum of the lexical "meanings" of the words in it is a damaging shortcut that has tempted many who were not simpleminded enough to know better. No matter what the intrinsic semantic nature of words may be, it is a *person*—an I—that means. To say what he means, and also to discover *to himself* what he means, a person uses words "meaningfully"—that is, he puts together words and phrases (all of which have some semantic character) in such a way that the utterance embodies, makes physical, declares, and discloses (not a prior abstraction called "his meaning," but) what was to be said.

Looking for the best words makes writing or speaking an act of creation:

To put it negatively, every imprecise word, every function ineptly handled, every convenient blanket-term, cliché, or piece of fashionable jargon will block, deflect, diffuse, and dissipate the thinking, turn it into some well-worn formulated channel that leads to the desert of banality or the ocean of tautology—a travesty of imagination. In language if there is no rhythm there is no life, if there is no tune there is nothing to listen to; if there is nothing at stake, no concern, there is nothing worth hanging on to and

nothing much worth saying. If the difficulties of writing plain, unadorned expository prose are formidable that is because there the situation is desperate: language takes its last stand and refuses to become mathematical notation. On no account should a "simple" use of language be taken as typical of the nature of language altogether.

Mr. Whalley is defending reverence for the life in thought, and in language—"what is perhaps our most precious gift, certainly, our most distinctively human capacity."

CHILDREN

. . . and Ourselves

MAKING SCIENCE RELEVANT

CHANGES in the teaching of science are the subject of an article by Christoph Hohenemser in the July/August *Environment*. The writer is associate professor of physics and chairman of the Program on Technology and Man at Clark University, Worcester, Mass. The question of how much and what sort of "science" should be taught to the general student is no longer easily answered. A few years ago, Mr. Hohenemser says, a single science course was regarded as adequate, and when successful in introducing students to scientific modes of thinking the course "served a highly useful purpose." Today, however, the single course has been replaced by dozens of vividly titled substitutes, and the writer finds many of them both pretentious and misleading.

Responsible, of course, for the change is the widespread interest in what is termed the "impact of science on society." As background for an account of his own teaching experience and for the proposals he has to offer, Mr. Hohenemser gives a further analysis of the change:

A major factor in present science-society teaching is that science and technology, despite its undisputed benefits appears to many to have gotten quite suddenly out of hand. Unintended and unexpected harm, increasing social costs, or just plain irritation accompany everywhere the benefits of technology. To the ordinary person who reads the daily paper, nothing appears simple any more, neither eating nor sleeping nor washing nor breathing, nor even loving. Because the new concerns with technology are much less abstract than nuclear policy, they are a natural and even imperative subject for the undergraduate curriculum.

A second important factor in the proliferation of physics-society courses is the changing educational atmosphere in our colleges. In the last ten years, an almost free market of courses has replaced elaborate general education requirements. Only major requirements remain, and even here, self-designed majors are possible. Few majors depend upon

physics, and thus, in an act of self-preservation, physics departments have joined with other science departments in a mad scramble to enroll nonscience students in special science courses designed for them. Add to this that, at least until last year, "relevance" was in, and it follows that science-society courses would suddenly arise, if for no other reason than to find bodies that could be counted down at the dean's office.

A third cause of science-society courses is that more scientists—physicists included—are looking squarely at the collapse of a once golden age of research funding and opportunity and are thus motivated to turn to problems of society as an outlet for their otherwise stymied creativity.

Thus, while our motives are in some respects lofty, they are certainly not pure. If we are honest, we ought to be skeptical about what we are doing and not doing, and we ought to admit failure in our teaching when it occurs.

One of the problems of the present-day physics teacher, Hohenemser says, is the suspicion of all science felt by a great many students. Not only are scientific subjects demanding of the student, but the teaching must now overcome hostility. What happens when "you mix a heavy dose of societal concern into these courses?" For reply to this question, the writer draws on his experience at two universities:

At Brandeis and at Clark, I have found that students show an even greater impatience with science and have, in fact, a strong desire to short-circuit the scientific content in order to get to the social implications. In my view, this all but destroys the value of the course, and perhaps, by giving the students the illusion of real understanding, considerable harm is done. In the framework of a single course, I have found no acceptable solution for this problem.

What this teacher did in effect was to bring the students to a realization that strong feelings of social concern may be misdirected when, in areas where crucial facts are unknown, their careful determination by some method of science is neglected. This is illustrated by an analytical course on urban transportation which he gave at both Clark and Brandeis. The course, as he says, "falls quite explicitly into the genre of physical

science." It was given to freshmen and sophomores.

The intent in each case was to introduce the physical dimensions of transportation systems, such as capacity, energy consumption, natural resource base, pollution products, and pollution health effect, and then to follow this with assessment of social costs, introduction of cost-benefit considerations and illustrations from various case studies.

A project in which some of the students participated was the determination of highway capacity, which is defined as the number of cars that can pass a point along a highway at a given speed. The capacity is naturally a function of the velocity of the vehicles. Carrying out their own vehicle counts, the students found that the highway patrol prescription (of maintaining a car length between vehicles for each additional ten miles of velocity) was not a good way of finding the actual capacity, and another formula was developed and applied to the cars on two heavily traveled highways during rush hour.

Another project undertaken by the students was critical study of a "rapid" transit trolley line connecting the Boston suburb, Newton, with the downtown area. The students were asked to ride the line, measure the speeds, the stopping time, and suggest improvements, if any seemed possible. The papers submitted by the students "agreed to a large extent with recommendations made in unpublished studies of Boston transit officials."

Some clearly useful research by the students was the evaluation of an actual local highway construction plan. Here the students made use of traffic counts and capacity models developed in earlier studies. The proposed plan involved the straightening and widening of Route 2, "a major radial artery connecting suburban Acton, Concord, Lincoln, and Lexington to Cambridge and downtown Boston." Elements to be considered included the fact that relocating and widening the highway would mar historic scenery and landmarks along the way, and that the route is paralleled by a commuter railroad which runs

eighteen trains a day to downtown Boston. Introducing this investigation, Mr. Hohenemser says:

Naturally, my first thought was to move more people by train and leave the proposed new road unbuilt. The question I therefore put to the students was: is it feasible to switch enough Concord-Boston commuters to the railroad, leaving aside for a moment the question how these commuters might be induced to change? I thought the answer would be a simple "yes." The students found otherwise.

They found otherwise because, from studying the traffic patterns, they learned that most of the cars using the existing Route 2 did *not* go straight into downtown Boston, but turned off in lateral directions (north and south) on another highway (128) which went around instead of into Boston. This highway is called an intermediate "belt" highway, whereas Route 2 is radial, aiming at the center of downtown. From this discovery it followed that—

although the railroad could carry ten times its present passenger load, without public transit on Route 128 there would be only a small number of additional customers. In fact, a survey of Concord residents and a reference to rail commuter counts to and from downtown Boston showed that about half of all the potential rail commuters were already using the railroad. These rail commuters numbered only 300 to 400 one way during the rush hour, as compared with about 4,000 auto commuters. The students had discovered an example of a major generalization about urban transportation: radially laid out urban rail lines do not meet most suburban commuter demand since travel is to a large extent transverse along belt corridors.

The students also found that the existing four-lane road of Route 2 was running far below its present capacity, and that the only real need was for overpasses to avoid grade-level intersections, which would double this capacity. However, the highway department, to which such suggestions had been made, was insisting that a six-lane highway was required for reasons of "sound engineering and safety." Since fatal accidents along this stretch of road are only a little more than the national average, Mr. Hohenemser

wonders if the fact that new highways are known to lead to further real estate development and greater population density has anything to do with the highway department's eagerness to widen Route 2. He remarks, in conclusion, that the multimillion dollar planning study done recently in Massachusetts calls for more *radial* rapid transit, without additional belt lines until 1985. Even in 1990, should this plan be followed, "it will be impossible to travel two miles transversely in suburban Boston without an automobile."

It seems fair to say that the students who did this work under Mr. Hohenemser gained a first-hand appreciation of the importance of impartial research, learning how science may be applied in behalf of the public good. The Technology and Man program he has instituted at Clark University offers similar problem-oriented courses such as "Energy and Man," "Man-Made Hazards," and "Water Pollution Control." It should be said that the students who did the best work in the transportation study were those who had already made a significant start in the study of science in high school, and were drawn towards social issues upon entering college.

FRONTIERS

Questions about "Non Violent Revolution"

THE current issue of *War Resistance*—quarterly publication of the War Resisters International (3, Caledonian Road, London N.1, England)—has some interesting comments on the draft of the Manifesto for a Non-Violent Revolution recently submitted to WRI members. The critic, Pranz Rauhut, thinks that the draft's condemnation of capitalism is partisan because it fails to include analysis of the negative side of the state capitalism of socialist countries. In these days of eager ideological emotion, this seems important to notice. Franz Rauhut also objects to the phrase, "the violence *inherent* in the capitalist system," arguing that the ugly drives of "greed" and "lust for power" commonly attributed to capitalism are qualities of human nature and "do not necessarily characterize a 'capitalist' enterprise."

Here the going is more difficult. There are all sorts of problems because any socialism worth talking about really sets out to transform human nature, whereas a large part of the justification for capitalism rests on the claim that it takes human nature the way it is and makes the best of it. The fact is that people sooner or later bend any system to embody their prevailing qualities. So far as we can see, Franz Rauhut is saying that socialism is supposed to put an end to greed and the lust for power, but *doesn't*, while capitalism is accused of giving these qualities full play, but that it *needn't*.

There is another problem. There are plenty of versions of what an "ideal" socialism would be like, but capitalism, being the system of the status quo (in most of the West), doesn't bother with visions of the ideal, but defends what is (with certain purifications, of course). Capitalism is usually advocated as a no-nonsense recognition of the facts of life, combining economic freedom with what justice is possible in the circumstances. The acquisitive drive is usually accepted (although under some nicer name) as the dynamo of progress, making it difficult to imagine what

"ideal" capitalism would be like, if only for a fair comparison with ideal socialism. In any event, the comparison would be completely theoretical, and likely to be worthless. (How, anyway, would you formulate an "ideal" embodiment of Social Darwinism?)

No doubt there are individuals whose behavior as owners or entrepreneurs under capitalism is above reproach. Franz Rauhut speaks of them. But their example does not settle the argument about social systems; instead, they tend to make it irrelevant, since they would make any system look good, and it would of course *be* good if there were enough of such people to transform it by everyday practice.

The way out of this dilemma chosen by Gandhi may be the best means of obtaining common assent. He did not admire capitalism, but declared that "exploitation of the poor can be extinguished not by effecting the destruction of a few millionaires, but by removing the ignorance of the poor and teaching them to noncooperate with their exploiters." He also said:

I am not ashamed to own that many capitalists are friendly toward me and do not fear me. They know that I desire to end capitalism almost, if not quite, as much as the most advanced socialist or even communist. But our methods differ, our languages differ. My theory of "trusteeship" is no make-shift, certainly no camouflage. I am confident that it will survive all other theories. It has the sanction of philosophy and religion behind it. That possessors of wealth have not acted up to the theory does not prove its falsity; it proves the weakness of the wealthy.

Gandhi's "tolerance" of capitalism seems to have been a lesser-of-two-evils view:

It is my firm conviction that if the State suppressed capitalism by violence, it would be caught in the coils of violence itself and fail to develop non-violence at any time.

What I would personally prefer, would be, not a centralization of power in the hands of the State but an extension of the sense of trusteeship; as in my opinion, the violence of private ownership is less injurious than the violence of the State.

Franz Rauhut also objects to calling for "revolution":

I am *against advocating revolution*, even though I realize that thereby I shall displease some advocates of the Manifesto. The term "revolution" has gained mysterious prestige, with Democrats because of the French Revolution of 1789, With Socialists and Communists because of the Russian one of 1917. However, he who studies history and the results of these and other revolutions without ideological spectacles arrives at the conclusion that revolutions make a disproportionately large number of victims and do not reach the intended aim. I can hear the objection, "But our revolution is to be a non-violent one." Against this I must affirm that non-violent pacifists will be unable to prevent the interference of those numerous revolutionaries for whom violence is part of their creed (cf. Mao's Little Red Book, p. 74: "Political power comes out of the barrel of a gun."). The Manifesto recommends the mobilization of the anger of the suppressed. But if we did this we ourselves would bring in those who believe in violence. In our country there are already now "peace organizations" which at one and the same time support non-violence and violence; would we non-violent people be able to prevent these people from cooperating? The revolution would begin non-violently; it would turn into bloodshed and, because of the great power interests involved, a world-wide conflagration would probably break out which might destroy a large part or all of mankind.

Hardly a word in the English language has as much heroic feeling-tone as the word "Revolution," which signifies complete and irreversible change. It is indiscriminately applied in many directions, seeming to be an indispensable part of the rhetoric of the times. Without it, the fraternity of the barricades, the stubborn struggles of the oppressed, the bravery and sacrifice of patriots and martyrs are all subtracted from what is said, leaving only the pallid appeals of "reformers," who seem to have earned more of the contempt of past revolutionaries than even the hereditary "class enemy" and other exploiters. But whether, by adding the prefix "non-violent," the term "revolution" can be made to convey only the best of both militance and pacifism remains an open question.

Gandhi also recognized this problem, and gave his synthesis more than fifty years ago:

Hitherto the word "revolution" has been connected with violence and has as such been condemned by established authority. But the movement of Non-cooperation, if it may be considered a revolution, is not an armed revolt; it is an evolutionary revolution, it is a bloodless revolution. The movement is a revolution of thought, of spirit. Non-cooperation is a process of purification, and, as such, it constitutes a revolution in one's ideas.

This does make a case for speaking of "Non-violent Revolution." But only if the implications of what Gandhi says acquire greater importance than the familiar emotional responses to almost any expression which has the word "revolution" in it. Slogans which blur in a wash of feeling the meaning of what one really stands for are not the best tools for workers for peace.