

SCIENCE AND POETRY

Science and poetry: it is sufficient to conjure up together these two terms of human experience to arouse an idea of opposition in some, an idea of exclusion in others and of suspicion in most. Two methods of perception of the exterior and interior world, at opposite ends of the human mind have produced two languages. They are so far from each other these two languages that have common origin, and after extending their branches to the opposite ends of the earth seem to be able to join together wishing to go beyond.

In seeking to distinguish probability from reality, on stripping the fundamental structure of the universe (macrocosm and microcosm) science has sought to short-circuit vagueness, the confusion of the senses. Then an Einstein took the risk of prolonging the thought of men of science to recognise that materially the most advanced conceptions ended in a *void*. A theoretical representation of the world, based on mathematical symbols, is empty where it is the result of a divorce with the senses. Because the only universe that man can really recognise is that which is created by his senses. Take away from man this

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Science and Poetry

world of appearances, this very special way of interpreting the world by means of psycho-somatics that comes from the sense organs to the neuro-physical integration not well understood; take away the world of colours, of shapes, of smell, of wind and rain, of heat, of volume and feeling; take away all this tissue of perceptions, of associations, of interpretations according to our organic structure and for man everything collapses. Yes, there is perhaps a cosmos without colour, without warmth, without sound, impalpable, a world of skeletal structure on which in spite of everything we are obliged to project our abstract symbols to depict it. Man's dream, projected on this world a look completely of the "exterior," seems unrealisable. We are intimately mixed up with this universe, basically we are made of the same material, possessed of the same energy. The same unknowns that link the atomic elements and the galaxies cross the phenomenon life, and that which we call spirit or conscience, that allows us to become involved always a little more in a cold world of abstract symbols. Everything goes if the real objective world finds itself hidden behind mathematical symbols. Behind these signs always unstable, the "real nature" of things does not always appear and the man of science is reduced to define the relations, to describe the events. But this faculty, that we call perception, allows him also to transcend himself, to see himself in the act of perceiving. And to wonder. To marvel. Set in the middle of the road between macrocosm and microcosm man finds, on either side, barriers that do not cross the abstract symbols. This man, built of the same elementary particles as the material, man, this ephemeral structure of the primordial earth space-time, knows not only to reason, but to dream, to be astonished, to marvel. It is here that the poet and the mystic join the scholar, are linked. At least for those who recognise that certain barriers are insurmountable for science and stop there, accepting the possibility the search for other means is nearer. Einstein, in speaking of this sentiment, of this quest that gives birth to the same limits of science said: "He to whom this emotion is stranger, who cannot be astonished and is without reverence, it is as though he were dead."

Science and poetry, subject so vast, to tell the truth. So I will content myself with outlining the axis of ideas that seem

to me to knit these two extreme branches of man's language. It seems to me that the problem should be examined from three angles:

First: What are the common elements, the links between these two branches?

Secondly: What scientific method can one bring to poetry, as a means of analysis and of understanding of a phenomenon, reputedly obscure, and more and more incomprehensible, say readers who desert, discouraged, from the realm of poetry? On the other hand, to see if science by its development has been able to bring—yes or no—a new field of action and of development for poetry, or again a new base, if I dare say scientific, to this function.

Thirdly: Can poetry—yes or no—bring any help whatever, a manner of thinking, a method to science, or more generally to men of science?

The three dimensions of this search will not be clearly evident and schematic in the course of this discussion. They provide the canvas, but it is impossible not to mix them, not to overlap, because they are so closely tied, faced differently with the same problem, called man.

Our plan of investigation thus posed, we must be in agreement from the beginning on the subject of terminology. As a hypothesis of work we propose the following: poetry is a language among other observable human ones, and without doubt among the living. So we must consider poetry as a language. But what is a language? A means of communicating thoughts and sentiments according to Larousse. One distinguishes generally the idea of "language," (*langage*), implying classically the use of words, from that of "tongue" (*langue*) which defines more precisely the system of signs that constitute the objective base of language. Language has a *function of communication and of organisation of conceptual categories admitted by the linguistic community*. Tongues are the tools, the vehicles, the codes that allow storage, a verbal organization of our perceptions that constitutes one of the most important bases of information. Nevertheless a great part of our knowledge of "civilization"

Science and Poetry

comes solely from verbal information. Among men language has attained such a degree of conceptual independence that it has ended by acquiring a kind of autonomous life if one can say so, forming a system of signs relatively independent. Expression of social life, language is also a condition. Man, human language and society are for us inseparable realities, to such an extent that one cannot conceive the idea of man without his language, and outside of a social organisation. But the idea of a language, or more exactly, the idea of a vehicle transporting a message, is not specifically human. We recognise it at all levels of life and today in the world of machines created by man. One could very well say that the language of animals and machines does not have a deliberate character, but essentially the system is there. A message is transmitted with the aid of a vehicle, of a code. And when we know that all the mass of information concerning the production programme of a human is contained in the special acids of the 48 chromosomes of the two germinal cells the union of which constitutes the human egg, must we not recognise that there is there as much and more information as in the municipal library? Not only the stock chromosome of the fertile egg cell and those of all its sister cells carry structural and functional information concerning the different cells of the tissues and organs, but the particular information concerning each type must be free at a given moment, for messages affecting certain groups of DNA, carriers of messages in their turn.

What is the language, what is the core of these nuclei acids? It is today accepted that the message that will determine the synthesis of the different proteins, that constitute the organic cellular edifice, is coded by a particular series of three or four bases on a chain data of DNA. Recent researches have shown that the generic information of each cell is "coded," "transcribed," and "read" by universal molecular mechanisms. We are almost certain that errors or alterations, due to exterior onslaughts, at the level of the mechanism of building up, of transmission of messages or of reading, are the origin of numerous cellular illnesses, and in particular of cancer.

All language being a vehicle of information there is nothing to prevent us considering poetry from the angle of *information*.

Tentative coded information, coming from the underground layer of man and of his liaisons with the living world as well as with the inorganic. An archeology of the human. This pursuit of special information is born in the sharp consciousness that certain of us have in a world that is never shut to rational knowledge.

The modern theory of messages and communications based on the physical probability that has revolutionized the technique can furnish an interesting illumination in the domain of language in general and of poetic language in particular.

To speak or to write is to try to transmit a coded message (all language is based on a code) containing information. In addition, this process of communication exists even in the presence of a speaker; thanks to his sensory system, everyone alive receives informations that are elaborated, collated, memorised in the central nervous system. It is thanks to these informations that an organism adapts itself to the contingent ambient milieu, adaptation allowing it to live efficiently in this milieu. These messages represent a form of organisation, of design or scheme, the "pattern" of Anglo-saxon authors. Here one must remember that according to the second law of thermodynamics, nature has a statistical tendency to disorder. One could explain the same thing by saying that in every isolated system the entropy is increased, otherwise this would produce a diminution of energy. Living organisms are not isolated systems because they absorb energy (in the form of food) coming from outside. On the other hand, as I have already said earlier, thanks to its perception every living organism makes enquiries of the outside world in order to adapt itself to its activity, in order to work in the best possible way. Life then is an organised structure, capable of ameliorating its exterior and interior organisation, thanks to the information from the world around it.

This apparatus appears then locally and temporarily to struggle against the general tendency to increase the entropy. By means of its capacity for adaptation, by reason of this possibility of defining future conduct as a result of past actions, by its faculty of analysis, of valuing, of using information, the living organism can produce around itself an area of organisation in the world of which the general tendency is to diminish itself.

First of all then, the information is a primordial element purely and simply to maintain life, afterwards for its evolution. And the social structures cannot be impaired or improved other than by means of a study of the messages and communications.

And in that which concerns human information it seems essential to be able to gather all the sources, rational as well as irrational. The more probable a message the less the information it furnishes. When one says probable one means the phenomenon of a system against a uniform condition, a kind of equilibrium, a different state. "Whatever is said to the contrary, the clichés and the commonplaces explain less than great poems" (Wiener).

The technical diagrams have a great formative value; they impose a healthy discipline on our imagination. They force us to have our ideas clear and logically indisputable. But it is exactly there that they transgress by excess. Imagination finds itself shut in, regimented, its possible paths prescribed in advance. Or they are precisely the forbidden territory, hidden tracks, unclear, where the imagination loves to idle. We instal the technical logic on the familiar circuits and are ready to think that these networks really constitute the universe.

We live in an era when an enormous mass of messages for each person (newspapers, cinema, radio, television, publicity, books) is given out every day with less and less real communication. For a great many people it is the way of saying less and less while talking more and more. The more frequent a message the less the real information. Information, to contribute something to the general information of the community must announce something substantially different from the common stock of knowledge already possessed. *A propos* it is interesting to observe in the light of the science of communication the existence in works of art of several sources of information. Thus, in the great classics there is in a first stage a diminution of the value of information: repetition can transform into clichés one aspect of a work. The chief works of Shakespeare or of Racine, the use of the geometric perspective of Dürer or Leonardo da Vinci at the moment where they become commonplace, do not contain the same informative value they did at the moment of their creation. Meanwhile a study, a more profound knowledge

of these works allows us access to sources of knowledge deeper, or new, the values of information are increased.

Besides the commonplace, the banality reproduced by thousands of copies offers no information.

Poetry is a constant struggle against the Niagara of standardization, to find a clear path we must give birth to new knowledge concerning man and the universe. This poetic spirit is the principal driving force of certain scientific search that is never found in the conventional.

Going back to verbal human language, it can be seen that since it tried to become an experimental science linguistics furnishes a knowledge of poetry.

Language is composed of two elements, two independent realities. According to Saussure one could call them by the terms meaningful and signify. Meaningful is the *sound* articulated. It is the phonic level. Signify is the idea or the concept. It is the semantic level. Here it must be noticed that the whole idea is the idea of something, then one has the right to come down to the *thing* itself, when it is of the *substance* that is signified. But it must also be noted that no substance can be considered as properly linguistic by itself. *Language is a form not a substance*. And this form has acquired so much that it must be studied as a closed system. And it is perhaps exactly this closed system that poetry has tried to explode in forcing us without ceasing to reconsider the meaning of the concept and of the sensory-perception of man, this reality that allows him before the same conceptualization, we have seen it, to survive, thanks to the liaisons with the world, thanks, in turn, to the information gathered in the ambient milieu.

But let us consider for a moment this form that is the group of relations knitted by each element to the interior of the system. It is this group that permits a given element to replenish its linguistic function. Language is then first of all a form, a structure that carries the message. We have said that poetry was language. A language constructed with words, the same words that serve men in their daily communication, we would say, prosaic. The same words, the same code serving indifferently the two categories of verbal human language: poetry and prose. This code spoken or written, corrected by men, does a disservice

to all the domains of information going to the heart of the dialogues of Plato, the juridical verbal process of the speculative hymns of the Veda, describing a boxing match. In front of such a polyvalence of standard, that is to say, of the tongue as a vehicle, the question poses itself: are there characters that are present in everything that seems to us poetry that are absent in everything that could be considered prose?

The question will be to know if there is a fundamental objective on which rests the classification of a text in one of the two categories: poetry or prose? To try to reply to this question we propose a certain method: to make a comparative study of the two categories of language. For such a study to be possible one must first be able to define one of the terms in a sufficiently objective manner. At first sight it suffices to convince us that prose is an everyday language and that poetry is something exceptional. (This is true at least in most of the known linguistic communities, but nothing need get in the way of imagining a community where the reverse is true. And if today the poets abandon certain images, figures and expressions called poetic to acquire ground reputedly antipoetic, the explanation lies in the dishonouring of certain words and images through cheap literature and a publicity that wants to think itself poetic). When we speak of everyday language, we understand language of daily use, or if one wishes to be more specifically scientific: "the group of forms statistically the most frequent in the language of the same linguistic community" (Cohen).

It seems to me evident that the most common usage of a tongue is on the level of the spoken language. But at the time of a comparative study the principle of homogeneity requires that the written poetic tongue must be compared with the written prose. But all writing also prosaic must imply a certain control of language, a supervision of forms of expression; the question is already of a language that can be elaborated.

And I shall learn nothing from those who are familiar with the Arab tongue remembering the metaphorical sense of the word "written," "*maktoub*."

One must find then among the different types of written prose one, that sufficiently stable and aesthetically the most colourless,

can serve as reference, with which one can compare in opposition the poetry, and all the other terms of the written language.

This type of prose does exist, there is plenty of it today: scientific prose in the non-technical sense seem tshe best to meet the double demand of stability and colourlessness. This prose called scientific can serve then as a kind of standard, of "degree zero of writing." It is with this we must compare all the other languages that use words to express themselves. One will see, in examining all the other modalities of language, that the grammatical faults and phono-semantics come from crossing the scientific prose with poetry; the usual term being prose called poetic. We have spoken of mistakes by comparison with the norm, by comparison with a degree zero, then we must examine this phenomenen that we call error. Valery, examining style, had already defined it as an error by comparison with everyday language. Set up again style that is not everyday, normal, usual. In this sense the fault, of which style is a modality, can be considered an error, like a violation of the code. This makes the fault exalted to the level of poetic language. Poetic language is manifestly irregular by comparison with current language. This irregularity could be considered as a maximum degree of style in opposition to the zero degree of style in the strictly scientific prose. Besides, versification seems like a mistake, codified it is true, by comparison with the phonic norm of the language. Likewise, but this time in a freer way, less codified, there exists a fault on the semantic level, (on the level of the meanings). We have said that language is analysed on two levels: phonic and semantic. That is to say a level of sounds and a level of meanings. And poetry we shall see is exactly the opposite. The best known of the classic characters of phonic poetry are metre and rhyme. There is a phonic character less known, nonetheless more general, authoritatively analysed by Jean Cohen, this is the rupture of the phono-semantic parallelism, that is to say of sound and sense of parallelism that is respected in all prose and broken by poetry. (In the course of its evolution versification has not ceased to increase the divergence between metre and syntax, it is always going further in the sense of being anti-grammatical).

The second linguistic level where poetry is different from prose is on the semantic level. The specific semantic characters

Science and Poetry

of poetic language have been less well codified than the phonetic characters. What rhetoric has described in the name of figures corresponds well with what we would like to call *differential semantic characters* of poetry. But it must be noted that the phonic level, the level of versification has long been the sole domain of the study of the poetic. It is with the birth of the prose-poem (we note in passing that this is a contradiction in terms) that the semantic side has become important. The prose-poem is from the linguistic point of view a text essentially semantic, since the phonic level, the resources of versification are not used. The *Songs of Maldoror* (*Chants de Maldoror*) are without doubt the first great semantic poem. Baudelaire, Rimbaud and Max Jacob, then Char and Michaux are the best known masters. This prose-poetry that we have called semantic must not be confused with blank verse where, in spite of the absence of metre and of classic rhyme, between a phonic element represented by the pause, that is to say rupture between verse and what we have mentioned earlier as a rupture of parallelism sound and sense or phono-semantic parallelism. Because the reality of this semantic poetry becomes more clearly visible we can oppose it with a poem purely phonetic, that brings out only the sound resources of the language. We can range there with Cohen the Sunday poets who are content to join rhyme and metre to a text that remains semantic prose.

There is a more interesting experience of phonic poetry, it is the adventure of *lettrisme*. As you know the *lettristes* have invented not only their words but also their phonemes, that is to say the sounds of their language. It must be said that this effort approaches more closely the experience of concrete music, in principle it is difficult to be marshalled in the category of the arts of verbal language, because language is meaning and not suggestion. For the same reason a certain tendency of modern poetry called "meaningless" is an absurdity. A language can perhaps be obscure as to the possibility of translating its meaning, but it cannot be absolutely without sense. The same remark can be applied to the endeavours of a spatialist group. These letters, syllables or words used to take the place of the verb, approach more the design of a sculpture or sound architecture than a verbal communication. But after throwing away all principles

the poetry is there, also to break up the language and serve as a link between the different languages of man. What seems to me more important in this sense is the experience of Michel Butor who constructs temporal—spatial objects in depth, in clearing the meanings, in working them out with the socio-cultural group. Two of his books, *Mobile* and *6,810,000 Litres of Water a Second*, are as much poetic objects where space and time are present in strength, as the studies of linguistic anthropology. This temporal-spatial in presentation at once resonant and semantic reminds me of the development of lines of force in a field such as is conceived by modern science.

After these parenthesis I pose the question: Could poetry be an observable scientific phenomenon? And why not? Is poetry to be secularized? If there is effectively something more in poetry than a psycho-linguistic fact, complex but scientifically observable, this one thing more will only increase such study, like the human phenomenon harassed by cybernetics only increases the importance in subjecting it to scientific investigation. One can suspect besides that this human residue, that survives machines, will survive, will rejoin poetry in that it is indefinable and uncountable. Otherwise, man and poetry will together disappear from this planet. It is necessary, then, coming to such a study to denounce above all a tiresome confusion between observation and observed fact. There must never be a fact, however obscure, prejudged by the method of observation adopted. Observation is one thing, interpretation is another. The method of experimental science we know, and we mistrust the judgments and hasty conclusions. In science it is permissible not to conclude, without sufficient observation.

If on examination it seems that a certain poetic obscurity is a necessity to surround certain denseness of the human not less obscure, nothing stops us from the study of the characters, the story and the eventual necessity for such obscurity. In other words this phenomenological obscurity, admitting that it offers a sort of *shape* that will produce an emotional result with the receiving-consumer, this obscurity on the level of the emotional, is not necessarily an obscurity at the level of the reflexive. And the fact of examining the machinery doesn't stop the machinery from operating on the sensibility of those who know how to

Science and Poetry

understand. There is always a residue of opacity where one produces, or does not produce, clarity. Opacity that will resist as much as man, man will resist, and certain men pretend investigations by means that are not rational.

Cutting across this idea of linguistic fault, the poetic must become at least partially, a science, making an appeal to statistical ideas. In effect statistics are the science of deviation in general, one doesn't see why they should not be applied to poetry, which, we have seen, on the linguistic plane can be characterised by a sum of variable faults, but quantitatively measurable. Since style is an error that explains itself quantitatively by comparison with a norm, one does not see why poetry, which is linguistically a great work of style, should not be submitted to the same analysis.

But before counting one must know what to count. Just as one must not commit errors of language in order to achieve style, so one must not be obscure or ungrammatical in order to write poetry. The real problem of style like the real problem of poetic error is not of the quantitative order, but qualitative. And this qualitative choice of valid deviations characteristic of poetry, will rest on the fact of the sensibility and the intuition. The psycho-physiological mechanisms of the aesthetic delight, this moment of discovery of beauty in a work or in the world outside, are the complex mechanisms that we are a long way from having elucidated. For my part I feel that such a study would allow us to discover behind the phenomenon of aesthetic pleasure the mechanisms, the psychological events that underlie it. Like all pleasures, the aesthetic pleasure of the ramifications of well-being, or the physiological disorders, come from the phenomena of accord or of opposition between our own dispositions and those outside us, and other phenomena, again, probably apparent to the activities of organic catalysers that allow by their presence the unfolding of certain operations of organic chemistry. In waiting for the development of the psycho-somatic we are then reduced to choosing our part of the beauty of the immense patrimony, this great museum of dedicated beauty that has formed our tastes and our sensibilities according to the geographical latitudes and the genetic form of each of us.

In that which concerns the judgments of value that sanction what is created under our eyes, they are left to the sensibility, the intuition, the experience of each of us, although this sensibility and this experience are separated with difficulty from those of the period and of the socio-cultural group. Is it always that for the moment that scientific aesthetics can only observe and analyse that *which has already been* judged by man? But nothing excludes that such a study could show us at least a part of the mechanics of aesthetic judgment.

In the meantime the investigation will be directed then to this acquired patrimony, confirmed by a public judgment, this great public that one calls "posterity." It is possible that this judgment will have left on one side important and beautiful works (I mean here everything that is important, even in art this is not necessarily beautiful, if beauty is reserved for a positive or agreeable psycho-somantic constellation: I will explain this later), then it is possible that a certain number of important works will pass unnoticed, but it is less probable that among the works chosen by posterity there will be a majority that are not really important. This choice reflects a profound human need, structural, that has been piled up by these works. This group, to which we can accord or not the much disputed epithet beauty, this choice remains an important body, eminently representative from the point of view of humanity. Thus one can pose with Jean Cohen, under the hypothesis of work, the existence in the language of all the poets: from one or several invariants or basic characteristics, a style identical or nearly so to deviate from set patterns. In other words the question is to put the linguistic fault like a rule close to poetic language.

To support this thesis, Cohen remarks that it must be possible to show on the one hand, that there is no poetry without error, and on the other, that there is no error without poetry. The first part of the hypothesis—no poetry without error, demands, in order to be demonstrated, that the poetic is already achieved. If it is possible for us to strip, to pass through a fine comb of linguistics all the poetry of today, it would at least be imprudent to judge the poetry of tomorrow.

Perhaps the knowledge of the total code that governs verbal communication would permit us such a conjecture. We are far

Science and Poetry

from it, that would appear difficult, but we have acquired the habit of speaking cybernetically: that is not probable, but it is not impossible.

The second term of the hypothesis: no error without poetry—demands evidence. We have seen it is not sufficient to make mistakes for the sake of style. If it is necessary to violate the linguistic code in order that poetry can be made to say what is wanted, this violation is probably not sufficient to create poetry.

We are conscious of the need to have a difference between, first, a phrase composed in a moment of frenzy, an absurd phrase composed by choosing six words at random from a dictionary and having to rephrase these words, and thirdly, a poetic phrase. In all three phrases there is a violation of the code of language. What is the difference? It is one of importance: the silliness of the poetic phrase is reducible, in other words one can in principle correct the faults, but such an operation is impossible with the totally absurd phrase and that uttered in delirium. We can also question these three phrases beside the theory of information. Information given by a discourse composed in a pathological state of delirium is rarely translatable, at least in actual terms of our knowledge. But one can think that there will be a day when we shall be able to understand this type of cerebral aberration, psycho-somatic.

The information conveyed by the phrase totally absurd is reduced to the information conveyed by each word, but structural analysis, that is to say analysis of meaning, the decoding of syntagmatic or paradigmatic units, is impossible. Again, I would specify the absurdity, in my opinion, one cannot limit the impossibility, the absurdity of the statement, to the absurdity of the logico-rational meaning, as Cohen thinks.

A phrase like: "The oysters of Senegal eat tricolour bread," which he cites as an absurd phrase, only offers a logico-rational absurdity. In my opinion it is not excluded that such a phrase could awake an emotion, and for my part I allow to be cited the same absurd humour in poetry. And if the information offered by such a sentence is absurd as regards experience, the contents is not less information, negative information certainly, but information all the same *on a specific human need, a need*

for fun, on the level of the sensory-cerebro-psychic mechanism. There is another domain of which we could be convinced in connection with this information, it is immediately negative, carrying an absurd message, but it could be positive. Such is the world of dreams. It seems to be that in applying the theory of information we must interpret this like a language in double code, perhaps triple. The first stage is easily readable on the level of the images of the words of history, the second stage, more difficult, the decoding of which psychoanalysis offers certain keys that often seem exact if we accept as proof of their validity the effectual aid they bring in the healing of the neurotic. No other keys would replace them evidently in giving identical results. The importance for me is to see proof of the fact that a language apparently illegible from the point of view of logico-rational decoding, could meanwhile be informative. One must mistrust the gratuitousness and know that the joke is a function without doubt essential in the development and the maintenance of the psycho-somatic equilibrium of man. This characteristic of language has been observed by certain psycho-linguists. One could not deny the importance in the poetical world. It seems good as a reversal of logico-rational conformism as well as a healthy practise for the spirit. And it is not insignificant that the author of *Alice in Wonderland* was a mathematician and a remarkable logician. It is right then not to limit words, and their connections in a sentence, to the sole image they evoke to the perception, even changing the resonances if one would. There is between a word, structures of the language and man an understanding of an intimate ontology, unique, organic, vital that makes analysis difficult and dangerous.

So, tied to the word, poetry is only completely perceptible with those who have a living and vital tie with the language which they use, and of which they understand not only the words, but perceive a long sequel of ramifications and affinity.

This understanding of the ramifications of a poetic language in the fields where not only rational thought but also perception as much as isolating, luminous union, delimiting a concept in broad day, cannot come in, takes us to that domain that since Freud has been called the subconscious.

Science and Poetry

The unconscious of psychoanalysis is it one of those domains towards which for all time one has heard poetic language flow?

We haven't time here to analyse all the connections between poetry and the subconscious. But for those who are aware of even a little of the theory and the methods of psychoanalysis, it must seem evident that this language deviation, as it is called pathologically, (admitting that prose is the normal language, of good health), has become charged with meanings that are not obvious, unconscious meanings, in the manner of certain neurotic symptoms. But if one wanted to get to the bottom of psychoanalytic thought, and particularly of the theory of neurosis, language must be considered in its group as a means of sublimation like the essential instrument of the general deviation of the libido towards social ends.

In the ontological development of the human one sees first the language of love parallel with the prevalence of the principle of pleasure. The two terms must as a sequel undergo a metamorphosis to become the language of work and principle of reality. Language should also be an operational superstructure, lifted on an erotic base, and understanding Eros in a sense of vital energy. On the level of the principle of pleasure, mentioned already with love, it must be brought back in this analysis as an important element: *the game*. The observation of children shows that for them to learn to speak is a game, and that language itself serves to enrich the game. For the psychoanalyst, language is metaphoric by its nature, and all metaphor is a play on words.

Language must then finally be analysed, from the point of view psychoanalytic, as a form of compromise; created by the conflict opposing the principle of pleasure with the principle of reality, following on that the process, the constitution of all the neurotic symptoms.

If one pushes psychoanalysis to its logical conclusion one must consider language as a neurotic symptom. This conclusion that only Freud saw, joins with the ideas of the school of linguistic analysis created by Wittgenstein. "Philosophy," wrote Wittgenstein, "is a battle against the bewitchment of the intelligence by language." There is another field of language to which psychoanalysis is particularly attached, that is the language of

magic, tied to a belief in the dominance of certain verbal constructions, thoughts or wishes. This belief in the dominance of thought and of language, to which it is intimately tied, this belief one finds among children, neurotic people, and certain poets.

Also, in regard to psychoanalysis, modern poetry inherited from the alchemists, from the mystics and all the sacred sources, does it share with psychoanalysis the task of carrying the subconscious to the conscious? To do this one must transcend language.

But if language is essentially a neurotic compromise between the erotic principal and the operational, it follows that the conscious, in the poetic use of language, *tends to destroy its own instrument in seeking to go beyond it.*

We come then to see that there, where linguistics has judged poetry as a language standing aloof from the norm, operating faults on two planes, phonic and semantic, at the level of sound and meaning, psychoanalysis in this distance of norms discovers a part of the game and pushing analysis further away, a sort of destructive caprice of rational language, the language of work, and of the principle of a certain social constraint, man wants to abolish it to rediscover paradise lost.

But the second term of our rash title, the term science, we remember as hard reality. Harshness due to our senses, since the physical wants to get rid of our senses not recognising any more the firmness of this material. In any case it is perhaps here that I must make clear what I think of the help that the poetic spirit can bring to scientific research. There are two fields where one can pursue researches. On the one hand it appears that our knowledge of the exterior world through our senses leads then from the integration of perception to an interpretation. The image that we ourselves give to the world is a representation then, a reality dressed up in code. Everything happens as if the messages come from the outside world, we can only use them when they are wrapped up in code, in interpreting them. The colour red is not represented as a radiation of a certain wave length or as comprised of photons of a given energy. This radiation that strikes certain cells of our retina produces certain physio-chemical transformations transmitted to the occipital cortex where the colour is observed

Science and Poetry

and interpreted. Consequently, from this operation, a fault occurs between reality and the brain of man. Physical science seeks to reduce this error, and to put in its place deceptive and chaotic representations of the senses, of the various abstract systems, to show to better advantage the reality, the objective reality.

Or, moving forward in the world of the infinitely small man has found irresolution, duality, paradox. He must also confront there information equally shocking for the conformist logic, for the reason comfortably installed in the millenary scheme, that an absurd sentence of the type "the Portuguese oyster eats tricolour bread," or like the description of the Queen's game of croquet in *Alice*. What is most extraordinary is that the description of this game of croquet should be as an attempt at a description before the letter or before the equation of the key problem of relativity which is the simultaneity of two elements at different points of space. The physical was found at the beginning of the century in front of the problems the solution to which required the creation of new keys, of new language.

It seems to me that science has arrived at a point where to go far it must do to a great extent what seems irrational, or it must accept and perhaps even create faults in relation to the norms to find new solutions, new languages, new keys to know how to interpret new information.

To show you the mistake that Einstein had to suffer in his thought, by comparison with the thoughts of the era, I would remind you in two words of the circumstances in which the generalized theory of relativity was born.

When your car goes at 120 kilometres an hour, this speed, measured on your speedometer is the relative speed of your car in relation to the ground. But what is your speed, not by comparison with a body no matter what, but in itself, that is to say in the absolute? Is there an absolute speed (or an absolute immobility) where all the speeds of bodies are relative to the speed, or the position of other bodies?

For Newton the question of absolute movement of a body was fundamental. The space of Newton and Kant was not an ideal form, but a kind of substance, like a container of which

the existence was independent of the body for which it was a substitute. From there, the movement of a body, by comparison with this system of immobile reference, was absolute movement. Einstein, the first to hold that absolute space did not exist, that space was not only constituted by comparison with bodies, that it could not have in itself, independent of the body, the character of a coordinated system. Then when we speak of a body that is animated by movement, this remark can only be in a relative sense. The body hasn't movement in itself, it only changes its position by comparison with another body. The terms of repose and of movement do not have an absolute sense in mechanical relativity.

Einstein was brought little by little to the conviction that the principle of relativity applied first of all to mechanics must be valid for all natural phenomena. In other words, he thought that in carrying out, for example, his optical tests, the same rule would be valid: absence of all system of absolute reference, of repose in space. But there was a troublesome fact that seemed inexplicable.

The text of Michelson-Morley had shown that light was projected at the same speed in all directions, relative to a system K, following the revolution of the earth round the sun. But the system of relativity supposed that a system K was physically equivalent to all systems K animated by contact with a rectilinear uniform movement. This would say that the light must be diffused at the same speed in all directions relative to all systems K also. A simple example shows clearly the difficulty of the problem: imagine a wave spreading in a circle on a lake; the speed of diffusion of this wave is necessarily different measured by comparison with a small craft that will leave in the same sense as the waves, and for a boat that comes in the opposite direction. But, experience shows, on replacing this wave by light, that the speed of this last was the same for the two observers.

What allowed Einstein to get out of this dilemma was the study of the simultaneity of two events happening in different places. Without going into details, it appeared that on the one hand "now" in one place did not signify "now" for all the world. On the other hand one learned that nature did not

Science and Poetry

tolerate that an action or a phenomenon should be transferable from one point to another in space at a speed superior to that of light.

These several ideas of the theory of relativity show us at what point this new material breaks with modern thought. About the same time the material brings other serious perturbations in the manner of classic thinking that obliges us to revise our ideas of causality and that of substance.

We remember that for Kant substance was that which persisted through phenomenal variations and of which the quantity was a vast measurement and immutable.

But what happens when a particle is converted to a beam of energy? What remains that authorises one to speak of an immutable substance? If the mass transforms itself into energy according to the famous Einstein equation $E = MC^2$, this energy that is dispersed in the form of beams cannot again assume the form of a substance. When the beam transforms itself anew into a particle, this particle cannot be recognised as identical with that which previously vanished. For the moment we will ignore the fact that an atom changes its condition suddenly to emit a ray, a luminous wave, for example. This transformation consists of the fact that an electron of an atom changes its state of movement, its orbit, for another. This passage from one state to another is only analysable mathematically, the definite ideas which we put forward for the description of this infinitesimal world do not admit it.

So ordinary language seems never to be able to describe how an atom works to emit or absorb light.

We have been able to see in the course of this short incursion into the realm of contemporary physics that these discoveries have demanded on the part of their promoters the same freedom to deviate from the ways of habitual thinking and of conformist logic that the poets practise vis à vis the norms of daily language. Besides we have come to comprehend that the physical material cannot take into account certain events of the world of the atom in terms of ordinary language. Only the completely abstract instrument, that is the mathematical language seems to be able, not to say, but to suggest symbolically what is happening.

To penetrate there, first of all then a new language must be created for the one to be learned by the others.

The poet saw the same expectation, except, of course, that he cannot spend an hour on an experimental proof of which way he will go. He pretends that he has something to say that cannot be put into ordinary language. This something that he wants to say to us, this information that he cannot communicate to us in a language that is coded; this language, to be accessible, will require an apprenticeship on the part of the reader, and this apprenticeship follows an effort at decoding, must otherwise be entirely remade, at least adapted each time that one comes to a poet who merits the name. For the rest poetic decoding will never be rigorous, that is to say that such a figure or such poetic technique applied to the level of language will never give place rigorously to the same sensory or intellectual interpretation. The law of causality here as for the physical material will turn away from the classic causality. The provisions of cause and effect will not assume any more the character of certainty, they can only be *statistics*.

To admit that the same figure, the same word, the same message can operate in a different way, in other terms that it can be decoded differently, it must be admitted that poetry and prose do not operate on the same level with the receiver. It must be admitted that certain words in the language can give place in their turn to a translation prosaic or poetic according to the level of perception and integration determined by the structure, where the word is inserted. It must be admitted also that certain figures of speech can only be apprehended by a certain stratum of people that for want of a better term we will call emotional. Lastly, admitting that a statement, of which the structure appears to the intellect to be absurd, can work, if one ignores the mental surprise, on the same emotional level.

The problem goes beyond the strict cadre of linguistics. *It is not sufficient any more to analyse the message exactly as the system suggests, but one must try to evaluate the subjective effect on the recipient. This is no more a problem of structure, but of the function of language.*

For the convenience of analysis, let us occupy ourselves with two functions only that seem of premier importance: the intel-

Science and Poetry

lectual or cognitive function and the emotional function. The first idea that presents itself is that poetic language has an emotional function, as opposed to the language of prose which has a cognitive function. Opposed in principle, it is doubtful if these two functions can be clearly separated. I am inclined to believe that the philogenic function most recent, that is, the cognitive, is more or less occultly under the influences of the emotional function. Jean Cohen tells us that the idea is emotionally neutral, an affirmation that we will leave with the dreamers. One has seen too many people kill each other for these ideas. And how to explain besides, the pleasure that certain intellectuals experience in tasting the most difficult abstractions, how to imagine also the very pure and undeniable beauty of the higher spheres of mathematics? Sublimation certainly, but most of our ideas are sublimations, and man doesn't seem to be able to do without them. Guile and the strength of man to transform excrements into pure gold are infinite. And this pure gold, always suspect, will be in turn transformed into the throne of the Gods. Also, can I not follow those who reconcile with poetic language the sole connotative function, in separating quite clearly the intellectual function reserved for prose, and especially for scientific prose?

Reduce poetry to an emotional function, to a tentative expression of emotions of which the objective is to recreate analagous emotions with the reader, seems to me too limited, at least that all human manifestation can in the last analysis be reduced to emotion, disguised, twisted. Meanwhile this is proved, if we consider that the substance of daily life tends rather towards a zero degree of emotion, that is to say towards indifference, then I should like poetry to have between other functions that of rousing a kind of perception I like to believe complete, and that the experience of ordinary daily life never calls forth. It must be noted here that nature herself, also artefacts, can be charged with emotional resonance. It is evident that this emotion, this poetry of things is in great measure a work of projection, but nothing stops one thinking of the possibility of certain liaisons with the outside world that are not only visible, but by the canals of axial relationship, in phenomenological differences.

If these emotional qualities immanent or acquired are real, how difficult it is to describe or to class them. Without counting that numbers of people exist who remain insensible to the emotional tonality of words, and by the span of things. And among those that are receptive, the same stimulus can according to their associations provoke different reactions. Passing from the prosaic to the poetic sense, the words then risk becoming too polyvalent and beyond a certain degree of *polysémie*, language doesn't function any more. Such uncertainty on the level of information carried, can this be justified in other respects. Perhaps if we consider that the important cannot be information emotional or representative properly speaking, but a certain game of stars emotional or representative that one could consider in the manner of a mobile where everyone inserts himself in the geometric place according to his needs. And this external constellation will serve as a sort of fixation or reconnaissance for several galaxies of motives present in each individual. We have seen moreover that the less a message is evident, expected, of close meaning (the more we are far from commonplace), the more it contains information.

But statistical studies of perceptive-emotional associations, in particular those carrying associations of colour, sentiment and music, have shown inside a socio-cultural group a close convergence with a response-type. There again we risk a relapse in commonplace reactions (those of the preceptive-emotional) and by this fact the source of information of the message will be diminishing there, or will produce the greatest statistical contraction. Only preventing the association of sensations of different nature is there an ordinary psycho-somatic process and it operates in general thanks to a proximity of emotional resonances.

The significant associations such as sharp, luminous, hard, high, light, fast, pointed, narrow are also ordinary that are opposed to those of hot, soft, weak, low, slow, serious, obscure, etc.

The words have essentially the emotional power that the community projects on the things they design. Mutations in the realm of emotional associations are more often of a pathological order. It is probable that once this power is established it can

develop without the intervention of the object. The tongue has its own life on the emotional plane and again on the representative plane, if such separation exists.

Do words virtually always have a double sense: representative of the cognitive on the one part, the emotional on the other. As Cohen remarked this last sense doesn't appear in the dictionary except under the title "without form" when the word forms the object of a metaphor. But one can imagine a connotative dictionary, that is to say, emotional. "Red" will signify there—certainly statistically—exciting, violent, and "green": calm, tranquility. But perhaps one day psycho-physiology will demonstrate that there is in these associations more than an acquired habit. Meanwhile, Osgood and his collaborators with their method of *measuring the senses* have tried to establish the bi-polar scale to seven degrees, posing at the respective poles two opposing adjectives: strong-weak, hot-cold, etc. The subjects are asked to place on the scales the word of which the sense has first been measured. The statistic analysis of a great number of replies allow of the construction of a *semantic space of three dimensions*, in which each concept is situated according to the emotional effort it lends to the socio-cultural group.

To conclude, I go back for the last time to language as a vehicle of information. The fundamental rule of all communication is to try to make the message clear enough, also as legible as possible; but this reading, we have seen, can be done by man at several levels. A message which seems intellectually obscure can be clarified by a more complete reading where the sensory-emotional stratum of the individual is allowed. If the poetic message is not understood by all, it is not necessarily the fault of the message. A scientific text is not understood by everyone. There must be a *poetic understanding* that is in part thanks to nature, but that is perhaps developed in a certain measure in the same way as mathematic knowledge or a musical ear. For those who understand the miracle of re-education, for those who know that we use only a tenth of our brain, that, in other respects emotional blockages are curable in most cases, any development of man seems possible.

Then if the truth that the poet explains appears absurd, it appears such to anyone who only possesses the normal language

code. The code of ordinary language is supported throughout by external experience. It is daily experience that determines that such a predicate satisfies such a subject. Then this association attains the force of a reflex condition, we find ourselves in the commonplace, where, as we have seen, important information is not carried any more by the subject. In saying "dark night" I am not making an important revelation on the subject of the night. And it had to be Eliot to draw out information from the conversation at a cocktail-party.

The code of poetic language is based on a larger field than that of outside experience which is joined to movements and immobilities of the field from within.

If the poetic sentence can be demonstrated as objectively false it can be restored by a more complete reading, where all possible levels participate, generally suppressed, or given little value. Scientific language today is stuffed with metaphors where the denotative sense is easy to establish. All poetic figures, as has been shown, have a semantic meaning. And the semanticism of these figures is metaphoric. Metaphor, here, is not a simple changing of sense but a metamorphosis of sense.

This metamorphosis is there to invite man to leave the daily world of routine, of habit, of conformity; to force him to penetrate regions joined to thought and to feeling where he will have to reconsider the spectacle of the world and his own situation in respect of this spectacle.

This language will lead, as Dante led his reader, from hell to paradise, or from paradise to hell, it will surprise, enchant or it will tear to pieces, a thousand times dead, and a thousand times resuscitated, only a single attitude stays forbidden: indifference.