

LANGUAGE, MIND, AND REALITY*

BENJAMIN LEE WHORF

FOREWORD, by JOHN B. CARROLL:¹ "Science, the quest for truth, is a sort of divine madness like love." A better statement of the spirit with which Benjamin Lee Whorf approached the problems of the human mind could hardly be phrased; these words were indeed written by Whorf himself and are taken from the essay reprinted below. They hold the key to the astonishing fact that Whorf could almost seem given to obscurantism—that he should have gone so far off the beaten track of the typical Western scientist as to have accepted an invitation to publish his thoughts in an Indian journal of theosophy. The reader will note that Whorf addressed himself to a theosophical audience not because of any self-conversion to theosophical doctrines but because he felt that such an audience might by its nature be better prepared to receive and sympathetically understand the rather unconventional, not to say mystical, formulations which he wished to communicate—because such an audience would be ready to ascend, with Whorf, to a state beyond mind itself in order to look at the world-mind as expressed in the phenomena of language.

That Whorf was a scientist, his writings leave no doubt. Born in Boston in 1897, he was trained as a chemical engineer at the Massachusetts Institute of Technology, graduating in 1918. Most of his professional career was spent in the employ of a Hartford fire insurance company, where he specialized in fire prevention problems arising in chemical industries. From student days, he was avocationally interested in the study of language, and through self-study acquired an impressive knowledge of a wide range of languages, not only of what he called the "standard average European" type but also of the more exotic and unusual varieties. He acquired the habit of spending several afternoons a week at the Watkinson Library in Hartford, a scholar's library which afforded a rich collection of materials in languages, particularly American Indian languages. In 1930 he obtained a leave of absence from his employer to enable him to go to Mexico and Yucatan to study the Aztec and Maya languages, under a grant from the Social Science Research Council. It was as an outcome of this visit that he published, in 1933, a remarkably ingenious suggestion as to how the non-

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¹ Lecturer on Education, Graduate School of Education, Harvard University; author of *A Survey of Linguistics and Related Disciplines*, soon to be published by the Harvard University Press.

numerical parts of the Maya hieroglyphic inscriptions and codices might be deciphered. He often found time to work on his studies at odd moments during travels for his employer, and he made frequent visits to the Yale University department of linguistics, where he sought out Edward Sapir, the eminent linguistic scientist and specialist in American Indian languages. Sapir and Whorf found themselves highly congenial, and it was undoubtedly Sapir who encouraged and guided his further studies.

Whorf became respected as a brilliant scientific analyst of languages. He was a master of phonemics, morphology, and other tools of linguistics. But from what we now know from the writings of the last ten years of his life, it is evident that Whorf's underlying motive in these studies was one that hardly any scientific linguist of the day, save Sapir, had the insight even to possess. That motive is obvious on every page of the article reprinted below: to understand the true, covert relations among language, mind, and reality. If Whorf was too daring in his postulations, the burden of proof will remain with the present and future generations of scientists. Whorf's passing, in 1941, prevented him from adding to the essential truths already evident in his work.

Except for a brief period of lecturing at Yale, Whorf never held an academic appointment of the usual sort. He claimed that his scholarly work was a luxury made possible only by the nature of his business connections. It was my privilege, under these circumstances, to have been his student—but not a student in the ordinary academic sense of the term. As a youth in the first years of high school, I made his acquaintance in 1930 as the result of a public lecture he gave concerning his experiences in Mexico. Learning of my interest in language study, he invited me to meet him every so often at the Watkinson Library or at his home. I vividly remember these meetings, which we continued to have intermittently over a period of some years. Looking over at his notes, I would watch him work out an Aztec translation, develop a hypothesis about a Maya hieroglyph, or sketch the phonemic system of Hopi. Whorf was a quiet, contemplative teacher; he would not stop at remaining silent for a seemingly interminable time while searching his mind to recall something or to think through a problem. Yet, when he became prompted to tell me of some new insight he had reached, the smoothness and lucidity of his remarks was little short of awesome. His mode of behavior was that of neither the scholar nor the business man—he gave only the impression of calm, unhurried, effortless inspiration. Self-seeking was entirely alien to him, and it is a tribute to him that he was so generous in sharing his remarkable perspectives with others.

I have been asked to suggest any excisions which might appropriately be made in the article reprinted below. After some reflection, I have decided that nothing in it is superfluous, and that even the sentences dealing with yogic philosophy, if properly interpreted, merely illustrate the particular genius with which Whorf's mind embraced all things.

PART I

IT NEEDS but half an eye to see in these latter days that science, the Grand Revelator of modern western culture, has reached, without having intended to, a frontier. Either it must bury its dead, close its ranks, and go forward into a landscape of increasing strangeness, replete with things shocking to a culture-trammelled understanding, or it must become, in Claude Houghton's expressive phrase, the plagiarist of its own past. The frontier was foreseen in principle very long ago, and given a name that has descended to our day clouded with myth. That name is Babel. For science's long and heroic effort to be strictly factual has at last brought it into entanglement with the unsuspected facts of the linguistic order. These facts the older classical science had never admitted, confronted, or understood as facts. Instead they had entered its house by the back door and had been taken for the substance of Reason itself.

What we call "scientific thought" is a specialization of the western Indo-European type of language, which has developed not only a set of different dialectics, but actually a set of different dialects. *These dialects are now becoming mutually unintelligible.* The term "space," for instance, does not and *cannot* mean the same thing to a psychologist as to a physicist. Even if psychologists should firmly resolve, come hell or high water, to use "space" only with the physicist's meaning, they could not do so, any more than Englishmen could use in English the word "sentiment" in the meanings which the similarly-spelled but functionally different French utterance *le sentiment* has in its native French.

Now this does not simply breed confusions of mere detail that an expert translator could perhaps resolve. It does something much more perplexing. Every language and every well-knit technical sub-language incorporates certain points of view and certain patterned resistances to widely divergent points of view. This is especially so if language is not surveyed as a planetary phenomenon, but is as usual taken for granted, and the local, parochial species of it used by the individual thinker taken to be its full sum. These resistances not only isolate artificially the particular sciences from each other; they restrain the scientific spirit as a whole from taking the next great step in development—a step which entails viewpoints unprecedented in science and a complete severance from traditions. For certain linguistic patterns rigidified in the dialectics of the sciences—often also embedded in the matrix of European culture from which those sciences have sprung, and long worshipped as pure Reason *per se*—have been worked to death. Even science senses that they are somehow out of focus for observing what may be very significant aspects of reality, upon the due observation of which all further progress in understanding the universe may hinge.

THUS one of the important coming steps for western knowledge is a re-examination of the linguistic backgrounds of its thinking, and for that matter of all thinking. My purpose in developing this subject before a Theosophical audi-

ence is not to confirm or affirm any Theosophical doctrines. It is because of all groups of people with whom I have come in contact, Theosophical people seem the most capable of becoming excited about ideas—new ideas. And my task is to explain an idea to all those who, if western culture survives the present welter of barbarism, may be pushed by events to leadership in reorganizing the whole human future.

This idea is one too drastic to be penned up in a catch phrase. I would rather leave it unnamed. It is the view that a noumenal world—a world of hyperspace, of higher dimensions—awaits discovery by all the sciences, which it will unite and unify, awaits discovery under its first aspect of a realm of *patterned relations*, inconceivably manifold and yet bearing a recognizable affinity to the rich and systematic organization of *language*, including *au fond* mathematics and music, which are ultimately of the same kindred as language. The idea is older than Plato, and at the same time as new as our most revolutionary thinkers. It is implied in Whitehead's world of prehensive aspects, and in relativity physics with its four-dimensional continuum and its Riemann-Christoffel tensor that sums up the *properties of the world* at any point-moment; while one of the most thought-provoking of all modern presentations, and I think the most original, is the *Tertium Organum* of Ouspensky. All that I have to say on the subject that may be new is of the *premonition in language* of the unknown, vaster world—that world of which the physical is but a surface or skin, and yet which we *are in*, and *belong to*. For the approach to reality through mathematics, which modern knowledge is beginning to make, is merely the approach through one special case of this relation to language.

This view implies that what I have called patterns are basic in a really cosmic sense, and that patterns form wholes, akin to the *Gestalten* of psychology, which are embraced in larger wholes in continual progression. Thus the cosmic picture has a serial or hierarchical character, that of a progression of planes or levels. Lacking recognition of such serial order, different sciences chop segments, as it were, out of the world, segments which perhaps cut across the direction of the natural levels, or stop short when, upon reaching a major change of level, the phenomena become of quite different type, or pass out of the ken of the older observational methods.

But in the science of linguistics, the facts of the linguistic domain compel recognition of serial planes, each explicitly given by an order of patterning observed. It is as if, looking at a wall covered with fine tracery of lacelike design, we found that this tracery served as the ground for a bolder pattern, yet still delicate, of tiny flowers, and that upon becoming aware of this floral expanse we saw that multitudes of gaps in it made another pattern like scroll-work, and that groups of scrolls made letters, the letters if followed in a proper sequence made words, the words were aligned in columns which listed and classified entities, and so on in continual cross-patterning until we found this wall to be—a great book of wisdom!

FIRST, the plane "below" the strictly linguistic phenomena is a physical, acoustic one, phenomena wrought of sound-waves; then comes a level of patterning in rippling muscles and speech organs, the physiological-phonetic plane; then the phonemic plane, patterning that makes a systematic set of consonants, vowels, accents, tones, etc. for each language; then the morpho-phonemic plane in which the "phonemes" of the previous level appear combined into "morphemes" (words and sub-words like suffixes, etc.); then the plane of morphology; then that of the intricate, largely unconscious patterning that goes by the meaningless name of syntax; then on to further planes still, the full import of which may some day strike and stagger us.

Speech is the best show man puts on. It is his own "act" on the stage of evolution, in which he comes before the cosmic backdrop and really "does his stuff." But we suspect the watching Gods perceive that the order in which his amazing set of tricks builds up to a great climax has been stolen—from the Universe!

The idea, entirely unfamiliar to the modern world, that nature and language are inwardly akin, was for ages well known to various high cultures whose historical continuity on the earth has been enormously longer than that of western European culture. In India, one aspect of it has been the idea of the *mantram* and of a *mantric art*. On the simplest cultural level a mantram is merely an incantation of primitive magic, such as the crudest cultures have. In the high culture it may have a different, a very intellectual meaning, dealing with the inner affinity of language and the cosmic order. At a still higher level it becomes "Mantra Yoga." Therein the mantram becomes a manifold of conscious patterns, contrived to assist the consciousness into the noumenal pattern-world—whereupon it is "in the driver's seat." It can then *set* the human organism to transmit, control, and amplify a thousandfold forces which that organism normally transmits only at unobservably low intensities.

Somewhat analogously, the mathematical formula that enables a physicist to adjust some coils of wire, tinfoil plates, diaphragms, and other quite inert and innocent gadgets into a configuration in which they can project music to a far country, puts the physicist's consciousness on to a level strange to the untrained man, and makes feasible an adjustment of matter to a very strategic configuration, one which makes possible an unusual manifestation of force. Other formulae make possible the strategic arrangement of magnets and wires in the power-house so that when the magnets (or rather the field of subtle forces, in and around the magnets) are set in motion, force is manifested in the way we call an electric current. We do not think of the designing of a radio station or a power plant as a linguistic process, but it is one nonetheless. The necessary mathematics is a linguistic apparatus, and without its correct specification of essential patterning the assembled gadgets would be out of proportion and adjustment, and would remain inert. But the mathematics used in such a case

is a *specialized* formula-language, contrived for making available a specialized type of force manifestation through metallic bodies only, namely, *electricity* as we today define what we call by that name. The mantric formula-language is specialized in a different way in order to make available a different type of force manifestation, by repatterning states in the nervous system and glands—or again rather in the subtle “electronic” or “etheric” forces in and around those physical bodies. Those parts of the organism, until such strategic patterning has been effected, are merely “innocent gadgets,” as incapable of dynamic power as loose magnets and loose wires, but *in the proper pattern* they are something else again—not to be understood from the properties of the unpatterned parts, and able to amplify and activate latent forces.

IN THIS WAY I would link the subtle eastern ideas of the mantric and yogic use of language with the configurative or pattern aspect which is so basic in language. But this brings me to the most important part of my discussion. We must find out more about language! Already we know enough about it to know it is not what the great majority of men, lay or scientific, think it is. The fact that we talk almost effortlessly, unaware of the exceedingly complex mechanism we are using, creates an illusion. We think we know how it is done, that there is no mystery; we have all the answers. Alas, what wrong answers! It is like the way a man’s uncorrected sense-impressions give him a picture of the universe that is simple, sensible, and satisfying, but very wide of the truth.

Consider how the world appears to any man, however wise and experienced in human life, who has never heard one word of what science has discovered about the Cosmos. To him the earth is flat; the sun and moon are shining objects of small size that pop up daily above an eastern rim, move through the upper air, and sink below a western edge; obviously they spend the night somewhere underground. The sky is an inverted bowl made of some blue material. The stars, tiny and rather near objects, seem as if they might be alive, for they “come out” from the sky at evening like rabbits or rattle-snakes from their burrows, and slip back again at dawn. “Solar system” has no meaning to him, and the concept of a “law of gravitation” is quite unintelligible—nay, even nonsensical. For him bodies do not fall because of a law of gravitation, but rather “because there is nothing to hold them up”—*i.e.*, because he cannot imagine their doing anything else. He cannot conceive space without an “up” and “down” or even without an “east” and “west” in it. For him the blood does not circulate; nor does the heart pump blood; he thinks it is a place where love, kindness, and thoughts are kept. Cooling is not a removal of heat but an addition of “cold”; leaves are green not from the chemical substance chlorophyll in them, but from the “greenness” in them. It will be impossible to reason him out of these beliefs. He will assert them as plain, hard-headed common sense; which means that they satisfy him because they are completely adequate as a

system of communication between him and his fellow-men. That is, they are adequate *linguistically* to his social needs, and will remain so until an additional group of needs is felt and is worked out in language.

But as this man is in conception of the physical universe, of whose scope and order he has not the faintest inkling, so all of us, from rude savage to learned scholar, are in conception of language. Only the science of linguistics has begun to penetrate a little into this realm, its findings still largely unknown to the other disciplines. Natural man, whether simpleton or scientist, knows no more of the linguistic forces that bear upon him than the savage knows of gravitational forces. He supposes that talking is an activity in which he is free and untrammelled. He finds it a simple, transparent activity, for which he has the necessary explanations. But these explanations turn out to be nothing but statements of the *needs that impel him to communicate*. They are not germane to the process by which he communicates. Thus he will say that he thinks something, and supplies words for the thoughts "as they come." But his explanation of why he should have such and such thoughts before he came to utter them, again turns out to be merely the story of his social needs at that moment. It is a dusty answer that throws no light. But then he supposes that there need be no light thrown on this talking process, since he can manipulate it anyhow quite well for his social needs. Thus he implies, wrongly, that thinking is an *obvious*, straightforward activity, the same for all rational beings, of which language is the straightforward expression.

ACTUALLY, thinking is most mysterious, and by far the greatest light upon it that we have is thrown by the study of language. This study shows that the forms of a person's thoughts are controlled by inexorable laws of pattern of which he is unconscious. These patterns are the unperceived intricate systematizations of his own language—shown readily enough by a candid comparison and contrast with other languages, especially those of a different linguistic family. His thinking itself is in a language—in English, in Sanskrit, in Chinese.² And every language is a vast pattern-system, different from others, in which is culturally ordained the forms and categories by which the personality not only communicates, but analyzes nature, notices or neglects types of relationship and phenomena, channels his reasoning, and builds the house of his consciousness.

This doctrine is new to western science, but it stands on unimpeachable evidence. Moreover, it is known, or something like it is known, to the philosophies

² To anticipate the text, "thinking in a language" does not necessarily have to use words. An uncultivated Choctaw can as easily as the most skilled *litterateur* contrast the tenses or the genders of two experiences, though he has never heard of any words like "tense" or "gender" for such contrasts. Much thinking never brings in words at all, but manipulates whole paradigms, word-classes, and such grammatical orders "behind" or "above" the focus of personal consciousness.

of India and to modern Theosophy. This is masked by the fact that the philosophical Sanskrit terms do not supply the exact equivalent of my term "language" in the broad sense of the linguistic order. The linguistic order embraces all symbolism, all symbolic processes, all processes of reference and of logic. Terms like *Nāma* refer rather to sub-grades of this order—the lexical level, the phonetic level. The nearest equivalent is probably *Manas*, to which our vague word "mind" hardly does justice. *Manas* in a broad sense is a major hierarchical grade in the world-structure—a "manasic plane" as it is indeed explicitly called. Here again "mental plane" is apt to be misleading to an English-speaking person. English "mental" is an unfortunate word, a word whose function in our culture is often only to stand in lieu of an intelligent explanation, and which connotes rather a foggy limbo than a cosmic structural order characterized by patterning. Sometimes *Manas* is used to mean, however, simply the personal psyche; this according to Mr. Fritz Kunz is the case in the famous saying of *The Voice of the Silence*: "The mind is the great slayer of the real."

It is said that in the plane of *Manas* there are two great levels, called the "*Rūpa*" and "*Arūpa*" levels. The lower is the realm of "name and form," *Nāma* and *Rūpa*. Here "form" means organization in space ("our" three-dimensional space). This is far from being co-extensive with pattern in a universal sense. And *Nāma*, "name," is not language or the linguistic order, but only one level in it, the level of the process of "lexation" or of giving words (names) to parts of the whole manifold of experience, parts which are thereby made to stand out in a semi-fictitious isolation. Thus a word like "sky," which in English can be treated like "board" (the sky, a sky, skies, some skies, piece of sky, etc.), leads us to think of a mere optical apparition in ways appropriate only to relatively isolated solid bodies. "Hill" and "swamp" persuade us to regard local variations in altitude or soil-composition of the ground as distinct *things* almost like tables and chairs. Each language performs this artificial chopping up of the continuous spread and flow of existence in a different way. Words and speech are not the same thing. As we shall see, the patterns of sentence structure that guide words are more important than the words.

Thus the level of *Rūpa* and *Nāma*—shape-segmentation and vocabulary—is part of the linguistic order, but a somewhat rudimentary and not self-sufficient part. It depends upon a higher level of organization, the level at which its *combinatory scheme* appears. This is the *Arūpa* level—the pattern world *par excellence*. *Arūpa*, "formless," does not mean without linguistic form or organization, but without reference to spatial, visual shape, marking out in space, which as we saw with "hill" and "swamp" is an important feature of reference on the lexical level. *Arūpa* is a realm of patterns that can be "actualized" in space and time in the materials of lower planes, but are themselves indifferent to space and time. Such patterns are not like the meanings of words, but they are some-

what like the way meaning appears in sentences. They are not like individual sentences but like *schemes* of sentences and designs of sentence structure. Our personal conscious "minds" can understand such patterns in a limited way by using mathematical or grammatical *formulae* into which words, values, quantities, etc., can be substituted. A rather simple instance will be given presently.

It is within the possibilities of the "culture of consciousness" that the Arupa level of the "mental" plane may be contacted directly in an expansion of consciousness. In Ouspensky's book, *A New Model of the Universe*, there are arresting glimpses of extraordinary mental states which that philosopher attained—adumbrations only, for these completely "non-lexical" vistas cannot be well put into words. He speaks of realms of "moving hieroglyphs" composed entirely of "mathematical relations," and of the expansion and ramification of such a "hieroglyph" till it covered a whole aspect of the universe. Ouspensky's mathematical predilections and his study of such things as non-Euclidean geometries, hyperspace, and the relation between time and consciousness, may have led him to stress mathematical analogies. Mathematics is a special kind of language, expanded out of special sentences containing the numeral words, 1, 2, 3, 4, . . . x, y, z, etc. But every other type of sentence of every language is also the potential nucleus of a far-reaching system. To very few is it granted to attain such consciousness as a durable state, yet many mathematicians and scientific linguists must have had the experience of "seeing" in one fugitive flash a whole system of relationships never before suspected of forming a unity. The harmony and scientific beauty in the whole vast system momentarily overwhelms one in a flood of aesthetic delight. To "see," for instance, how all the English elementary sounds ("phonemes") and their groupings are coordinated by an intricate yet systematic law into all possible forms of English monosyllabic words, meaningful or nonsensical, existent or still unthought of, excluding all other forms as inevitably as the chemical formula of a solution precludes all but certain shapes of crystals from emerging—this might be a distinct experience.

TO SHOW the full formula for this law or pattern—a so-called "morpho-phonemic structural formula"—I should need a large piece of paper. I can however set up a condensed form of it as:

$$\begin{aligned} &O, C - ng, C_1C_2, C_3C_4, \text{etc.} \dots \\ &s \pm C_m C_n + V + (V_1) O, \pm (r, w, y); \\ &C - h, C'_1C'_2, C'_3C'_4, \text{etc.} \dots \\ &C'_m C'_n \pm (t/d, s/z, st/zd).^3 \end{aligned}$$

This formula requires that the English words be symbolized or "spelt" accord-

³The full formula from which this is abbreviated is printed and explained in my paper "Linguistics as an Exact Science" in *Technology Review*, December 1940, Massachusetts Institute of Technology, Cambridge, Mass.

ing to standard phonemic spelling of the type described by Leonard Bloomfield in his book *Language*. In this system the diphthongal vowels must be represented by a pure vowel (V) followed by *w* or *y* from the term (*r, w, y*), so that "note" is symbolized *nout* (or *newt*, depending on the dialect), "date" is *deyt*, "ice" is *ays*. That this is correct analysis on the physical or acoustic level is shown by the fact that if we reverse a phonographic recording of "ice" we get a sound like *sya*, and if we say "sya" properly into the phonograph and reverse it the machine will say "ice." For *English* this analysis happens to be exact also on the structural level two stages above the acoustic one, for the *ys* of *ays* (ice) is seen to be on the same line of pattern as the *ls* of *els* (else), the *ns* of *sins* (since) the *ts* of *hats*, etc.—it is part of a general architectonic scheme of having two consonants together.

Now, by reading the commas in the formula as "or" we see that the formula is equivalent to a large series of subsidiary formulae. One of the simplest of these is $O + V + C - h$ (see how it is contained in the big formula) which means that the word can begin without a consonant and with any one vowel followed by any one consonant except *h*—giving us words like *at, or, if*. Changing the first term to the next symbol in the big formula, we get $C - ng + V + C - h$, which means that the word, ending as before, can begin with any single English consonant except the *ng* sound as in "sing" (this sound ought to be written with *one* symbol, but in deference to the printer I shall employ the usual digraph). This pattern gives us the long array of words like *hat, bed, dog, man*, and permits us to coin new ones like *tig, nem, zib*—but not, be it noted, *ngib* or *zib*.

So far the patterns are simple. From now on they become intricate! The formula in this abbreviated form needs along with it a series of lists of assorted consonants, like so many laundry lists, each list being represented by one of the symbols C_1, C_2 , etc. The formula C_1C_2 means that you can begin the word with any consonant out of list C_1 and follow it with any from list C_2 , which happens to contain only *r* and *l*. Since C_1 contains *p, b, f*, for instance, we can have words like *pray, play, brew, blew, free, flee*, and the nonsensical *frig, blosb*, etc. But suppose we want a word beginning with *sr, zr, tl, or dl*. We go to our list C_1 , but to our surprise there is no *s, z, t, or d*, on it. We appear to be stumped! We pick up our other lists, but are no better off. There is no way of combining our lists according to the formula to get these initial combinations. Evidently there just aren't any such English words; and what is more, any budding Lewis Carrolls or Edward Lears will somehow mysteriously refuse to coin such words. This shows that word-coining is no act of unfettered imagination, even in the wildest flights of nonsense, but a strict use of already patterned materials. If asked to invent forms not already prefigured in the patternment of his language, the speaker is negative in the same manner as if asked to make fried eggs without the eggs!

THUS the formula sums up every combination that English one-syllable words or word-like forms have, and bars out every one they do not and cannot have. Contained in it is the *mpst* of glimpsed, the *ksths* of sixths, the *fbt* of "he fifthed it," the *nchst* of the queer but possible "thou *munchst* it greedily," and multitudes of other "rugged sounds which to our mouths grow sleek," but which would have "made Quintilian stare and gasp." At the same time the formula *bars out* numerous smooth but to us difficult (because unpatterned) combinations, like *litk*, *fpat*, *nwelng*, *dzogb*, and a myriad more, all possible and easy to some languages, but not to English.

It will be evident that implicit in our one-syllable words is an undreamed-of complexity of organization, and that the old gag, "say it in words of one syllable," as a metaphor of simplicity, is from the standpoint of a more penetrative insight the most arrant nonsense! Yet to such insight this old cliché bears unconscious witness to the truth that those who easily and fluently use the intricate systems of language are utterly blind and deaf to the very existence of those systems, until the latter have been, not without some difficulty, pointed out.

And the adage "as above, so below" applies strongly here. As below, on the phonological plane of language, significant behavior is ruled by pattern from outside the focus of personal consciousness, so is it on the higher planes of language that we call expression of the thought. As we shall see in Part II, thinking also follows a network of tracks laid down in the given language, an organization which may concentrate systematically upon certain phases of reality, certain aspects of intelligence, and systematically discard others featured by other languages. The individual is utterly unaware of this organization and is constrained completely within its unbreakable bonds.

PART II

WE SAW in Part I that in linguistic and mental phenomena significant behavior (or what is the same, both behavior and significance, so far as interlinked) are ruled by a specific system or organization, a "geometry" of form-principles characteristic of each language. This organization is imposed from outside the narrow circle of the personal consciousness, making of that consciousness a mere puppet whose linguistic maneuverings are held in unsensed and unbreakable bonds of pattern. It is as if the personal mind, which selects words but is largely oblivious to pattern, were in the grip of a higher, far more intellectual mind which has very little notion of houses and beds and soup-kettles, but can systematize and mathematize on a scale and scope that no mathematician of the schools ever remotely approached.

And now appears a great fact of human brotherhood—that human beings are all alike in this respect. So far as we can judge from the systematics of language, the higher mind or "unconscious" of a Papuan head-hunter can mathe-

matize quite as well as that of Einstein; and conversely, scientist and yokel, scholar and tribesman, all use their personal consciousness in the same dim-witted sort of way, and get into similar kinds of logical *impasse*. They are as unaware of the beautiful and inexorable systems that control them as a cow-herd is of cosmic rays. Their understanding of the processes involved in their talk and ratiocination is a purely superficial, pragmatic one, comparable to little Sue Smith's understanding of the radio, which she turns on in such a way as to evoke a bedtime story. Men even show a strong disposition to make a virtue of this ignorance, to condemn efforts at a better understanding of the mind's workings as "impractical," or as "theories" if the condemner happens to be a yokel, or as "metaphysics" or "mysticism" or "epistemology" if he happens to be wearing the traditionally correct turn-out of a scientist. Western culture in particular reserves for the investigators of language its most grudging meed of recognition and its meagrest rewards, even though it has to counter the natural human tendency to find language, mysterious as it is, the most fascinating of subjects—one about which men love to talk and speculate unscientifically, to discuss endlessly the meaning of words, or the odd speech of the man from Boston as it appears to the man of Oshkosh, or vice versa.

The higher mind would seem to be able to do any kind of purely intellectual feat, but not to "be conscious" on the personal level. That is, it does not focus on practical affairs and on the personal ego in its personal, immediate environment. Certain dreams and exceptional mental states may lead us to suppose it to be conscious on its own plane, and occasionally its consciousness may "come through" to the personality; but barring techniques like Yoga, it ordinarily makes no nexus with the personal consciousness. We could call it a higher ego, bearing in mind a distinctive trait, appearing through every language, and its one striking resemblance to the personal self; namely, that it organizes its systems around a nucleus of three or more pronominal "person" categories, centered upon one we call the first person singular. It can function in any linguistic system—a child can learn any language with the same readiness, from Chinese, with its separately toned and stressed monosyllables, to Nootka of Vancouver Island, with its frequent one-word sentences such as *mamamamabl'n'iqk'ok-maqama*—"they each did so because of their characteristic of resembling white people." ⁴

BECAUSE of the systematic, configurative nature of higher mind, the "patternment" aspect of language always overrides and controls the "lexation" (Nāma) or name-giving aspect. Hence the meanings of specific words are less

⁴ This word and sentence contains only one *nāma* or lexation, *mamabl* or "white-race person." The rest is all grammatical pattern which can refer to anything. The Nootka stem or Nāma for "doll" with the same operations done upon it would mean "they each did so because of their doll-like-ness."

important than we fondly fancy. Sentences, not words, are the essence of speech, just as equations and functions, and not bare numbers, are the real meat of mathematics. We are all mistaken in our common belief that any word has an "exact meaning." We have seen that the higher mind deals in symbols that have no fixed reference to anything, but are like blank checks, to be filled in as required, that stand for "any value" of a given variable, like the C's and V's in the formula cited in Part I, or the x , y , z of algebra. There is a queer Western notion that the ancients who invented algebra made a great discovery, though the human unconscious has been doing the same sort of thing for eons! For the same reason the ancient Mayas or the ancient Hindus, in their staggering cycles upon cycles of astronomical numbers, were simply being human. We should not however make the mistake of thinking that words, even as used by the lower personal mind, represent the opposite pole from these variable symbols, that a word *does* have an exact meaning, stands for a given thing, is only *one* value of a variable.

Even the lower mind has caught something of the algebraic nature of language; so that words are in between the variable symbols of pure patternment (Arūpa) and true fixed quantities. That part of meaning which is in words, and which we may call "reference," is only relatively fixed. Reference of words is at the mercy of the sentences and grammatical patterns in which they occur. And it is surprising to what a minimal amount this element of reference may be reduced. The sentence "I went all the way down there just in order to see Jack" contains only one fixed concrete reference, namely, "Jack." The rest is pattern attached to nothing specifically; even "see" obviously does not mean what one might suppose, namely, to receive a visual image.

Or again, in word reference we deal with size by breaking it into size classes—small, medium, large, immense, etc.—but size objectively is not divided into classes, but is a pure continuum of relativity. Yet we think of size constantly as a set of classes because language has segmented and named the experience in this way. Number-words may refer not to number as counted, but to number classes with elastic boundaries. Thus English "few" adjusts its range according to the size, importance or rarity of the reference. A "few" kings, battleships, or diamonds might be only three or four, a "few" peas, rain-drops or tea-leaves might be thirty or forty.

You may say, "Yes, of course this is true of words like large, small, and the like; they are obviously relative terms, but words like dog, tree, house, are different—each names a specific thing." Not so; these terms are in the same boat as "large" and "small." The word "Fido" said by a certain person at a certain time may refer to a specific thing, but the word "dog" refers to a class with elastic limits. The limits of such classes are different in different languages. You might think that "tree" means the same thing everywhere and to everybody. Not at all. The Polish word that means "tree" also includes the meaning

"wood." The context or sentence pattern determines what sort of object the Polish word (or any word, in any language) refers to. In Hopi, an American Indian language of Arizona, the word for dog, *pobko*, includes pet animal or domestic animal of any kind. Thus "pet eagle" in Hopi is literally "eagle-dog"; and having thus fixed the context a Hopi might next refer to the same eagle as so-and-so's *pobko*.

BUT LEST this be dismissed as the vagary of a "primitive" language (no language is "primitive"), let us take another peep at our own beloved English. Take the word *hand*. In "his hand" it refers to a location on the human body, in "hour hand" to a strikingly dissimilar object, in "all hands on deck" to another reference, in "a good hand at gardening" to another, in "he held a good hand (at cards)" to another, while in "he got the upper hand" it refers to nothing but is dissolved into a pattern of orientation. Or consider the word *bar* in the phrases: iron bar, bar to progress, he should be behind bars, studied for the bar, let down all the bars, bar of music, sand bar, candy bar, mosquito bar, bar sinister, bar none, ordered drinks at the bar!

But, you may say, these are popular idioms, not scientific and logical use of language. Oh, indeed? "Electrical" is supposed to be a scientific word. Do you know what its referent is? Do you know that the "electrical" in "electrical apparatus" is not the same "electrical" as the one in "electrical expert"? In the first it refers to a current of electricity in the apparatus, but in the second it does not refer to a current of electricity in the expert. When a word like "group" can refer either to a sequence of phases in time or a pile of articles on the floor, its element of reference is minor. Referents of scientific words are often conveniently vague, markedly under the sway of the patterns in which they occur. It is very suggestive that this trait, so far from being a hall-mark of Babbitry, is most marked in intellectual talk, and—*mirabile dictu*—in the language of poetry and love! And this needs must be so, for science, poetry, and love are alike in being "flights" above and away from the slave-world of literal reference and humdrum prosaic details, attempts to widen the petty narrowness of the personal self's outlook, liftings toward Arūpa, toward that world of infinite harmony, sympathy and order, of unchanging truths and eternal things. And while all words are pitiful enough in their mere "letter that killeth," it is certain that scientific terms like "force," "average," "sex," "allergic," "biological," are not less pitiful, and in their own way no more certain in reference than "sweet," "gorgeous," "rapture," "enchantment," "heart and soul," or "star dust." You have probably heard of "star dust"—what is it? Is it a multitude of stars, a sparkling powder, the soil of the planet Mars, the Milky Way, a state of day-dreaming, poetic fancy, pyrophoric iron, a spiral nebula, a suburb of Pittsburgh, or a popular song? You don't know, and neither does anybody. The word—for it is one *lexation*, not two—has no reference of its own. Some words are

like that.⁵ As we have seen, reference is the lesser part of meaning, patternment the greater. Science, the quest for truth, is a sort of divine madness like love. And music—is it not in the same category? Music is a quasi-language based entirely on patternment, without having developed lexation.

SOMETIMES the sway of pattern over reference produces amusing results, when a pattern engenders meanings utterly extraneous to the original lexation reference. The lower mind is thrown into bewilderment, cannot grasp that compelling formulae are at work upon it, and resorts wildly and with glad relief to its favorite obvious type of explanation, even "seeing things" and "hearing things" that help out such explanation. The word *asparagus*, under the stress of purely phonetic English patterns of the type illustrated in the formula cited in Part I, rearranges to *sparagras*; and then since "sparrer" is a dialectical form of "sparrow," we find "sparrow grass" and then religiously accepted accounts of the relation of sparrows to this "grass." "Cole slaw" came from German *Kohl-salat*, "cabbage salad," but the stress of the pattern tending to revamp it into "cold slaw" has in some regions produced a new lexation "slaw," and a new dish "hot slaw"! Children of course are constantly repatterning, but the pressure of adult example eventually brings their language back to the norm; they learn that Mississippi is not Mrs. Sippy, and the equator is not a menagerie lion but an imaginary line. Sometimes the adult community does not possess the special knowledge needed for correction. In parts of New England, Persian cats of a certain type are called Coon cats, and this name has bred the notion that they are a hybrid between the cat and the "coon" (raccoon). This is often firmly believed by persons ignorant of biology, since the stress of the linguistic pattern (animal-name 1 modifying animal-name 2) causes them to "see" (or as the psychologists say "project") objective racoon quality as located on the body of the cat—they point to its bushy tail, long hair, and so on. I knew of an actual case, a woman who owned a fine "Coon cat," and who would protest to her friend: "Why, just *look* at him—his tail, his funny eyes—can't you see it?" "Don't be silly!" quoth her more sophisticated friend. "Think of your natural history! Coons cannot breed with cats; they belong to a different family." But the lady was so sure that she called on an eminent zoologist to confirm her. He is said to have remarked, with unwavering diplomacy, "If you like to think so, just think so." "He was even more cruel than you!" she snapped at her friend, and remained convinced that her pet was the outcome of an encounter between a philandering raccoon and a wayward cat! In just such ways on a vaster scale is woven the web of *Māyā*, illusion begotten of entrenched selfhood. I am told that Coon cats received their name from one Captain Coon, who brought the first of these Persian cats to the State of Maine in his ship.

⁵ Compare "kith" and "throes," which give no meaning, and a bewildering effect, without the patterns "kith and kin" and "in throes of."

In more subtle matters we all, unknowingly, project the linguistic relationships of a particular language upon the universe, and *see* them there, as the good lady *saw* a linguistic relation (Coon = raccoon) made visible in her cat. We say "see that wave"—the same pattern as "see that house." But without the projection of language no one ever saw a single wave. We see a surface in everchanging undulating motions. Some languages cannot say "a wave"; they are closer to reality in this respect. Hopi say *walalata*, "plural waving occurs," and can call attention to one place in the waving just as we can. But since actually a wave cannot exist by itself, the form which corresponds to our singular, *wala*, is not the equivalent of English "a wave," but means "a slosh occurs," as when a vessel of liquid is suddenly jarred.

English pattern treats "I hold it" exactly like "I strike it," "I tear it," and myriads of other propositions that refer to actions effecting changes in matter. Yet "hold" in plain fact is no action, but a state of relative positions. But we think of it, even see it, as an action, because language sets up the proposition in the same way as it sets up a much more common class of propositions dealing with movements and changes. We *ascribe* action to what we call "hold" because the formula, substantive + verb = actor + his action, is fundamental in our sentences. Thus we are compelled in many cases to read into nature fictitious acting-entities simply because our sentence patterns require our verbs, when not imperative, to have substantives before them. We are obliged to say "it flashed" or "a light flashed," setting up an actor *it*, or *a light*, to perform what we call an action, *flash*. But the flashing and the light are the same; there is no thing which does something, and no doing. Hopi says only *rehpi*. Hopi can have verbs without subjects, and this gives to that language power as a logical system for understanding certain aspects of the cosmos. Scientific language, being founded on western Indo-European and not on Hopi, does as we do, sees sometimes actions and forces where there may be only states. For do you not conceive it possible that scientists as well as ladies with cats all unknowingly project the linguistic patterns of a particular type of language upon the universe, and *see* them there, rendered visible on the very face of nature? A change in language can transform our appreciation of the cosmos.

ALL THIS is typical of the way the lower personal mind, caught in a vaster world inscrutable to its methods, uses its strange gift of language to weave the web of *Mâyā* or illusion, to make a provisional analysis of reality and then regard it as final. Western culture has gone farthest here, farthest in determined thoroughness of provisional analysis, and farthest in determination to regard it as final. The commitment to illusion has been sealed in western Indo-European language, and the road out of illusion for the West lies through a wider understanding of language than western Indo-European alone can give. This is the "Mantra Yoga" of the western consciousness, the next great step, which it is

now ready to take. It is probably the most suitable way for western man to begin that "culture of consciousness" which will lead him to a great illumination.

Again, through this sort of understanding of language is achieved a great phase of human brotherhood. For the scientific understanding of very diverse languages—not necessarily to speak them, but to analyze their structure—is a lesson in brotherhood which is brotherhood in the universal human principle—the brotherhood of the "Sons of Manas." It causes us to transcend the boundaries of local cultures, nationalities, physical peculiarities dubbed "race," and to find that in their linguistic systems, though these systems differ widely, yet in the order, harmony, and beauty of the systems, and in their respective subtleties and penetrating analysis of reality, all men are equal. This fact is independent of the state of evolution as regards material culture, savagery, civilization, moral or ethical development, etc., a thing most surprising to the cultured European, a thing shocking to him, indeed a bitter pill! But it is true; the crudest savage may unconsciously manipulate with effortless ease a linguistic system so intricate, manifoldly systematized, and intellectually difficult that it requires the life-time study of our greatest scholars to describe its workings. The manasic plane and the "higher ego" have been given to all, and the evolution of human language was complete, and spread in its proud completeness up and down the earth, in a time far anterior to the oldest ruin that molds in the soil today.

Linguistic knowledge entails understanding many different beautiful systems of logical analysis. Through it, the world as seen from the diverse viewpoints of other social groups, that we have thought of as alien, becomes intelligible in new terms. Alienness turns into a new and often clarifying way of looking at things. Consider Japanese. The view of the Japanese that we get outwardly from their governmental policy seems anything but conducive to brotherhood. But to approach the Japanese through an aesthetic and scientific appreciation of their language transforms the picture. *That* is to realize kinship on the cosmopolitan levels of the spirit. One lovely pattern of this language is that its sentence may have two differently ranked subjects. We are familiar with the idea of two ranks of *object* for our verbs, an immediate and a more remote goal, or direct and indirect object as they are commonly called. We have probably never thought of the possibilities of a similar idea applied to *subjects*. This idea is put to work in Japanese. The two subjects—call them subject 1 and subject 2—are marked by the particles *wa* and *ga*, and a diagram might show them with a line drawn from each subject-word, the two lines converging upon the same predication, whereas our English sentence could have only one subject with one line to the predicate. An example would be the way of saying "Japan is mountainous": "Japan₁ mountain₂ (are) many";⁶ or: "Japan, in regard to it mountains are many." "John is long-legged" would be "John₁ leg₂ (are) long." This pattern

⁶ "Are" is in parenthesis because "be many" is expressed by a single verb-like word. The Japanese ordinarily does not use a plural.

gives great conciseness at the same time with great precision. Instead of the vagueness of our "mountainous," the Japanese can, with equal compactness of formulation, distinguish "mountainous" meaning that mountains not always high are abundant, from "mountainous" meaning that mountains not abundant relative to the whole area are high. We see how the logical uses of this pattern would give to Japanese great power in concise scientific operations with ideas, could this power be properly developed.

THE MOMENT we begin scientific, unbiased *research* into language we find, in people and cultures with the most unprepossessing exteriors, beautiful, effective, and scientific devices of expression unknown to western Indo-European tongues or mentalities. The Algonquin languages are spoken by very simple people, hunting and fishing Indians, but they are marvels of analysis and synthesis. One piece of grammatical finesse peculiar to them is called the obviative. This means that their pronouns have four persons instead of three, or from our standpoint two third persons. This aids in compact description of complicated situations, for which we should have to resort to cumbersome phraseology. Let us symbolize their third and fourth persons by attaching the numerals 3 and 4 to our written words. The Algonquins might tell the story of William Tell like this: "William Tell called his₃ son and told him₄ to bring him₃ his₃ bow and arrow, which₄ he₄ then brought to him₃. He₃ had him₄ stand still and placed an apple on his₄ head, then took his₃ bow and arrow and told him₄ not to fear. Then he₃ shot it₄ off his₄ head without hurting him₄." Such a device would greatly help in specifying our complex legal situations, getting rid of "the party of the first part" and "the aforesaid John Doe shall, on his part, etc."

Chichewa, a language related to Zulu, spoken by a tribe of unlettered Negroes in East Africa, has two past tenses, one for past events with present result or influence, one for past without present influence. A past as recorded in external situations is distinguished from a past recorded only in the psyche or memory; a new view of *time* opens before us. Let 1 represent the former and 2 the latter; then ponder these Chichewa nuances: I came₁ here; I went₂ there; he was₂ sick; he died₁; Christ died₂ on the cross; God created₁ the world. "I ate₁" means I am not hungry; "I ate₂" means I am hungry. If you were offered food and said: "No, I have eaten₁," it would be all right, but if you used the other past tense you would be uttering an insult. A Theosophical speaker of Chichewa might use tense 1 in speaking of the past involution of Monads, which has enabled the world to be in its present state, while he might use tense 2 for, say, long-past planetary systems now disintegrated and their evolution done. If he were talking about Reincarnation he would use 2 for events of a past incarnation simply in their own frame of reference, but he would use 1 in referring to or implying their "Karma." It may be that these primitive folk are equipped

with a language which, if they were to become philosophers or mathematicians, could make them our foremost thinkers upon *time*.

Or take the Coeur d'Alene language, spoken by the small Indian tribe of that name in Idaho. Instead of our simple concept of "cause," founded on our simple "makes it (him) do so," the Coeur d'Alene grammar requires its speakers to discriminate (which of course they do automatically) between three causal processes, denoted by three causal verb-forms: (1) growth, or maturation of an inherent cause, (2) addition or accretion from without, (3) secondary addition *i.e.*, of something affected by process 2. Thus, to say "it has been made sweet" they would use form 1 for a plum sweetened by ripening, form 2 for a cup of coffee sweetened by dissolving sugar in it, and form 3 for griddle cakes sweetened by syrup made by dissolving sugar. If, given a more sophisticated culture, their thinkers erected these now unconscious discriminations into a theory of triadic causality, fitted to scientific observations, they might thereby produce a valuable intellectual tool for science. *We* could imitate artificially such a theory, perhaps, but we could *not* apply it, for *we* are not habituated to making such distinctions with effortless ease in daily life. Concepts have a basis in daily talk before scientific workers will attempt to use them in the laboratory. Even relativity has such a basis in the western Indo-European languages (and others)—the fact that these languages use many space words and patterns for dealing with time.

LANGUAGE has further significance in other psychological factors on a different level from modern linguistic approach but of importance in music, poetry, literary style, and eastern mantram. What I have been speaking of thus far concerns the plane of Manas in the more philosophical sense, the "higher unconscious" or the "soul" (in the sense as used by Jung). What I am about to speak of concerns the "psyche" (in the sense as used by Freud), the "lower" unconscious, the Manas which is especially the "slayer of the real," the plane of Kāma, of emotion or rather feeling (Gefühl). In a serial relation containing the levels of Nāma-Rūpa and Arūpa, this level of the unconscious psyche is on the other side of Nāma-Rūpa from Arūpa, and Nāma or lexation mediates in a sense between these extremes. Hence the psyche is the psychological correlative of the phonemic level in language, related to it not structurally as is Nāma or lexation, not by using it as building blocks, as word-making uses the phonemes (vowels, consonants, accents, etc.); but related as the feeling-content of the phonemes. There is a universal, Gefühl-type way of linking experiences, which shows up in laboratory experiments and appears to be independent of language—basically alike for all persons.

Without a serial or hierarchical order in the universe it would have to be said that these psychological experiments and linguistic experiments contradict each other. In the psychological experiments human subjects seem to associate

the experiences of bright, cold, sharp, hard, high, light (in weight), quick, high-pitched, narrow, and so on in a long series, with each other; and conversely the experiences of dark, warm, yielding, soft, blunt, low, heavy, slow, low-pitched, wide, etc., in another long series. This occurs whether the *words* for such associated experiences resemble or not, but the ordinary person is likely to *notice* a relation to words only when it is a relation of likeness to such a series in the vowels or consonants of the words, and when it is a relation of contrast or conflict it is passed unnoticed. The noticing of the relation of likeness is an element in sensitiveness to literary style or to what is often rather inaccurately called the "music" of words. The noticing of the relation of conflict is much more difficult, much more a freeing oneself from illusion, and though quite "unpoetical" it is really a movement toward Higher Manas, toward a higher symmetry than that of physical sound.

What is significant for our thesis is that language, through lexation, has made the speaker more acutely conscious of certain dim psychic sensations; it has actually produced awareness on lower planes than its own; a power of the nature of magic. There is a yogic mastery in the power of language to remain independent of lower-psyche facts, to override them, now point them up, now toss them out of the picture, to mould the nuances of words to its own rule, whether the psychic ring of the sounds fits or not. If the sounds fit, the psychic quality of the sounds is increased, and this can be noticed by the layman. If the sounds do not fit, the psychic quality changes to accord with the linguistic meaning, no matter how incongruous with the sounds, and this is not noticed by the layman.

Thus the vowels *a* (as in *father*), *o*, *u*, are associated in the laboratory tests with the dark-warm-soft series, and *e* (English *a* in *date*), *i* (English *e* in *be*) with the bright-cold-sharp set. Consonants also are associated about as one might expect from ordinary naive feeling in the matter. What happens is that when a word has an acoustic similarity to its own meaning we can notice it, as in English *soft* and German *sanft*. But when the opposite occurs nobody notices it. Thus German *zart* (*tsart*) "tender" has such a "sharp" sound, in spite of its *a*, that to a person who does not know German it calls up the bright-sharp meanings, but to a German it "sounds" *soft*—and probably warm, dark, etc., also. An even better case is *deep*. Its acoustic association should be like that of *peep* or of such nonsense-words as *veep*, *treep*, *queep*, etc., *i.e.*, as bright, sharp, quick. But its linguistic meaning in the English language happens to refer to the wrong sort of experience for such an association. This fact completely overrides its objective sound, causing it to "sound" subjectively quite as dark, warm, heavy, soft, etc., as though its sounds really were of that type. It takes illusion-freeing, if unpoetic, linguistic analysis to discover this clash between two "musics," one more mental and one more psychic, in the word. Manas is able to disregard properties of the psychic plane, just as it can disregard whether an equational x

refers to automobiles or sheep. It can project parts of its own patterns upon experience in such a way that they distort, and promote illusion; or again in such a way that they illuminate, and build up scientific theories and tools of research.

YOGA is defined by Patanjali as the complete cessation of the activity of the versatile psychic nature.⁷ We have seen that this activity consists largely of personal-social reactions along unperceived tracks of pattern laid down from the Arūpa level functioning above or behind the focus of personal consciousness. The reason why the Arūpa level is beyond the ken of the consciousness is not because it is essentially different (as if it were, e.g., a passive network) but because the personality does focus, from evolution and habit, upon the aforesaid versatile activity. The stilling of this activity and the coming to rest of this focus, though difficult and requiring prolonged training, is by reliable accounts from widely diverse sources, both eastern and western, a tremendous expansion, brightening and clarifying of consciousness, in which the intellect functions with undreamed-of rapidity and sureness. The scientific study of languages and linguistic principles is at least a partial raising of the intellect toward this level. In the understanding of a large linguistic pattern there is involved a partial shift of focus away from the versatile psychic activity. Such understandings have even a therapeutic value. Many neuroses are simply the compulsive working over and over of word systems, from which the patient can be freed by showing him the process and pattern.

All this leads back to the idea touched upon in Part I of this essay, that the types of patterned relationship found in language may be but the wavering and distorted, pale, substanceless reflection of a *causal world*. Just as language consists of discrete lexation-segmentation (*Nāma-Rūpa*) and ordered patternment, of which the latter has the more background character, less obvious but more infrangible and universal, so the physical world may be an aggregate of quasi-discrete entities (atoms, crystals, living organisms, planets, stars, etc.) not fully understandable as such, but rather emergent from a field of causes that is itself a manifold of pattern and order. It is upon the bars of the fence, beyond which it would meet these *characters of the field*, that science is now poised. As physics explores into the intra-atomic phenomena, the discrete physical forms and forces are more and more dissolved into relations of pure patternment. The *place* of an apparent entity, an electron for example, becomes indefinite, interrupted; the entity appears and disappears from one structural position to another structural position, like a phoneme or any other patterned linguistic entity, and may be said to be *nowhere* in between the positions. Its locus, first thought of and analyzed as a continuous variable, becomes on closer scrutiny a mere alternation;

⁷ Bragdon's paraphrase of the Yoga Sūtras, *An Introduction to Yoga*, Claude Bragdon, New York, 1933.

situations "actualize" it, structure beyond the probe of the measuring rod governs it; three-dimensional shape there is none, instead—"Arūpa."

SCIENCE cannot yet understand the transcendental logic of such a state of affairs, for it has not yet freed itself from the illusory necessities of common logic which are only at bottom necessities of grammatical pattern in western Aryan grammar; necessities for substances which are only necessities for substantives in certain sentence positions, necessities for forces, attractions, etc. which are only necessities for verbs in certain other positions, and so on. Science, if it survives the impending darkness, will next take up the consideration of linguistic principles and divest itself of these illusory linguistic necessities, too long held to be the substance of Reason itself.

Now, the mental antipathies of men, like the fears of men, are very elemental, widespread, and momentous mental phenomena. But they are also in their fundamental nature extremely capricious, and extremely suggestible mental phenomena. Let an individual man alone, and he will feel antipathies for certain other human beings very much as any young child does — namely, quite capriciously — just as he will also feel all sorts of capricious likings for people. But train a man first to give names to his antipathies, then to regard the antipathies thus named as sacred merely because they have a name, and then you get the phenomena of racial hatred, of religious hatred, of class hatred, and so on indefinitely. Such trained hatreds are peculiarly pathetic and peculiarly deceitful, because they combine in such a subtle way the elemental vehemence of the hatred that a child may feel for a stranger, a cat for a dog, with the appearance of dignity and solemnity and even of duty which a name gives. Such antipathies will always play their part in human history. But what we do about them is to try not to be fooled by them, not to take them too seriously because of their mere name. We can remember that they are a childish phenomena in our lives, phenomena on a level with a dread of snakes, or of mice; phenomena that we share with the cats and with the dogs, not noble phenomena, but caprices of our complex nature. JOSIAH ROYCE.