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Natural History



COMMUNICATION AMON

While preserving man's wealth of languages, we can achieve worldwide communication by adopting two languages and a system of signs that will be universally understood



Long before modern technology brought the peoples of the world within speaking distance of each other, prophets and philosophers had begun to think about the possibilities of universal languages that would remove the dangers symbolized by the story of the Tower of Babel. In the Western world, there have been serious attempts to invent new languages based on European grammatical forms. It was hoped that these languages would do what Latin once did for the tiny literate medieval European community and what diplomatic French did for the nineteenth-century political community. Esperanto was the language most vigorously pursued by idealistic enthusiasts. Interlingua, a written scientific language, is a current attempt to provide those of us whose languages are Indo-European with better forms of communication.

Since foresighted individuals first began thinking about these problems however, the world has changed. While new technologies have mad

by Margaret Mead and Rudolf Modley

LL PEOPLE, EVERYWHERE

former dreams obsolete in detail, they are still relevant to the world's needs. Today we have to deal with new and demanding conditions. Anyone on this planet can travel to any part of it in 36 hours. But the people of the earth speak some 2,800 languages, and it would be impossible to provide enough interpreters at airports to aid these potential travelers. Even the simultaneous arrival at an airport of aircraft from a variety of countries, whose pilots speak only their own languages, occasionally causes difficulties at control towers.

These conditions present a challenge to the inventiveness of the modern world. To people who cannot travel, get on and off trains, ships, and airplanes, or find an inn because of language barriers, the new freedom of movement is meaningless.

The Instantaneous Message

A first requirement, then, for our technologically developed world is a set of clear, unambiguous signs that can be understood by the speakers of any language, and by the members of any culture, however primitive. These signs will enable mankind to use the great new freedom of world-wide travel. Without them, hungry, frightened, confused people will continue to clog the travel lanes, come to grief on the roads, return disenchanted to their small provincial worlds, and contribute to the isolation and hostility in which many human communities live today.

Such signs are necessary for all travelers—for the boy riding a bicycle as well as for the motorist in a large city. We call these signs glyphs.

Glyphs are the only universal graphic communications device that is in public use. They are beginning to appear on highways, in world's fairs, at hotels and inns, and on machines and appliances the world over.

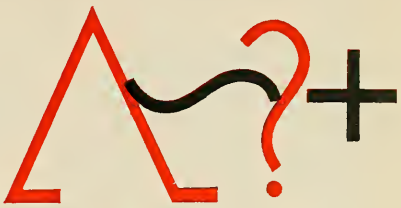
Glyphs communicate visually. Their message provokes "visual thinking" instead of "verbal thinking." Visual thinking has a direct and immediate impact on the viewer: a picture of a horse is an image of a horse to all men. No further interpretation is required. Verbal thinking, on the other hand, requires a more complex process. The word *horse*, or *cheval* (French), or *Pferd* (German) has to be heard or read first, and only then (if he can speak or write the specific language) can the intended recipient of the message interpret the meaning.

The advantages of a glyph are thus twofold:

1. Glyphs don't require knowledge of a language, spoken or written. The message of a glyph is unambiguous, simple, and understandable to anybody who has once "learned it." An arrow pointing right means "turn right"; two moving legs mean "go."

2. Glyphs create a direct and immediate impact and thus permit immediate response. This applies as well to those who know a language as to those who do not. This immediacy of response saves thinking. What Alfred North Whitehead has said of mathematical notations applies also to glyphs: "By relieving the brain of

Glyphs—universal graphic symbols—should be immediately understandable. A symbol that shows an object's image fills this need, but such symbols (the telephone, for example) may become badly outdated. Concept-related symbols—the bent arrow (turn right), walking legs (go), and wavy line (water)—are clear and timeless. The question mark and plus sign are arbitrary symbols and give no clue to their meanings.



all unnecessary work. a good notation sets it free to concentrate on more advanced problems."

Graphic symbols (of which glyphs are those selected for worldwide communication) can be image-related, concept-related, or arbitrary.

An *image-related graphic symbol* refers to the real object by resemblance in different degrees of "fidelity." A symbol for a cow would be an image-related symbol if it were to show a silhouette of a cow. Image-related symbols have the great advantage of being easily recognized, easily learned, and easily retained. But it would be wrong to jump to the quick conclusion that such symbols are the ones we should always choose for glyphs. One trouble with image-related symbols is that in these rapidly changing times the objects that the symbols represent change frequently with technical innovations, new packaging, and fashion. An image-related symbol of an automobile, created today, would look out of date a decade from now. The same is true of locomotives, clothing, airplanes, and of many products that require packaging.

Concept-related symbols tend to have a longer life-span. The horizontal wavy symbol for water, the directional arrow, the vertical wavy symbol for smoke or fire are more representative of our idea of water. direction, or fire than of the actual visual image. Yet, the symbol will be clear to people of most cultures; and once learned, it will be easily retained and recognized.

Finally, we have *arbitrary symbols*, which have no visual relation to an image or a concept. Because of this, such symbols are more difficult to teach, more difficult to learn, and harder to retain and recognize.

The graphic symbols in current common use, such as letters and numerals, punctuation marks, and mathematical operators, are all arbitrary symbols. Some have developed over centuries, others over thousands of years, often after competition with other symbols. This is especially true of mathematical notations. Early in the year 1696, Gottfried Wilhelm Leibnitz, one of the major developers of mathematical notations, said in a letter: "As regards signs, I see it clearly that it is to the interest of the Republic of Letters and especially of students, that learned men should reach agreement on signs."

What Leibnitz said almost 300 years ago is true today for other graphic symbols. Their advantages are so apparent and the need for them so pressing that they are popping up everywhere. Sets of proposed glyphs are being developed by different international bodies for highways, for railways. for airlines and airports, for machine tools, for hospitals, and for many other products and services. World's fairs and Olympics, too, often develop their own sets of symbols to guide and inform visitors.

The result has been much experimentation, some progress, and a great deal of confusion. The creation of symbols by organizations with a limited scope of authority (airports, railways, or even a single hospital) causes waste and confusion and threatens us with chaos.

Some international bodies have taken action to channel the many efforts into co-ordinated thinking, research, and development. International design groups have set up a Commission on International Signs and Symbols which works with UNESCO, the International Standards Organization, the International Chamber of Commerce, and others. Out of these efforts, a worldwide set of unambiguous and instant non-linguistic graphic symbols may emerge.

But we are still far from attaining this objective. How far is made apparent by a recent test of the road signs and symbols adopted in Britain. Motorists and pedestrians were separately tested on their ability to recognize "standard" road signs. Only about one-third of all motorists tested could correctly identify a sign that prohibited all motor traffic; only two-thirds could identify a sign that indicated "no passing." Many motorists obviously do not know the signs that directly affect their own safety. Pedestrians (those without a current driver's license) did even more poorly. Only 34 per cent could identify the "no entry" sign and only 18 per cent the sign prohibiting bicycles and motorbikes. The reason is apparently twofold: first, the so-called International Road Signs are very poor in concept and design (they are not in use in the United States), and second, an insufficient effort was made to "teach" the signs before they were introduced.

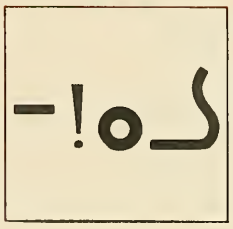
We can now see more clearly what is needed if the world is to have a set of glyphs that will help travel, trade, safety, and communication in general. We need co-ordinated re-

A Blissymbolics

B International Committee for Breaking the Language Barrier

C Expo 67

D International Air Transport Association



A



B



C



E



F



G

E No Entry

F No Passing

G All Motor Vehicles Prohibited

lotorists and pedestrians in Britain proved in a recent test that many not know the meaning of road signs such as those ve. Women demonstrated ess recognition than men.

is what happens when al groups try to solve oblem in glyph creation. e of these symbols ars to have much ce of winning the race simple and meaningful h for "No Smoking."



D

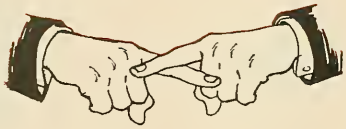
search, development, and testing; broad private and public support for glyph development; a nationwide educational campaign as glyphs are introduced into any one country; and a permanent body of international and national experts to keep the international symbol system up to date, effective, and simple. Until we reach that time, all symbol systems currently in use should be thought of as only temporary and subject to replacement.

A Rich Second Language

While a universal series of glyphs permits anyone who has learned a very few symbolic devices to move about anywhere, safely, and find comfort and rest, the need for a spoken language, which will enable people from any part of the world to communicate with people from any other part, is of a different order. Here the hope is that we can in some way develop a language in which all the peoples of the earth can really talk with each other, not merely about the business of money, schedules, directions, and rules of the road —which are the problems that can be solved by glyphs—but about events, about politics and religion, about memories of the past and hopes for the future. We need a language that can be spoken to very young children; a language that can be spoken by a woman giving birth in a foreign hospital or by someone having an emergency operation in a strange country; a language in which a psychiatrist can speak to a disoriented foreign sailor; a language through which a professor can find out what is troubling a brilliant foreign graduate student who is doing badly. We need, indeed, a language that runs the gamut of human experience, that is redundant in the extreme because it allows for use by the stupid as well as the bright, by the child, the senile, and the disturbed, by the mother singing her child to sleep and the lover shyly importuning his beloved.

When the first idealists began making up new universal languages on a European base, the difference between a natural language and a carefully constructed, perfectly regular, "easier to learn" artificial language was not yet understood. People believed that one barrier to learning certain languages was that those languages were particularly hard to learn; another barrier was a chauvinistic preference for one language over another. The answer seemed to be to create, using some known set of more generalized grammatical rules, a new language, which, its advocates admitted, people would have to *learn* to speak. But it was not then understood that a natural language differs from an artificial language in features that we do not at the present time have the skill to build into a new language: redundancies, for instance, of sound patterns, cadence, accent, and intonation which in a natural language developed over centuries of use by individuals of different levels of intelligence. Like a human culture—the complete repertoire of learned human behavior characteristic of a society—a language is based in the history of its predecessors. It has been changed through time by the unconscious and inarticulate behav-

Regardless of their language backgrounds, the deaf can communicate through visual signs. Here, uncrossing the fingers expresses "but."







ior of its speakers, and sometimes consciously and articulately by those who have attempted to write rules of grammar and spelling. Because it was shaped by all its users, by those who stammered and stuttered as well as by its orators, it can be learned by any human being who is completely exposed to it.

We know that children easily learn the language spoken around them, even if it seems difficult to the speakers of other languages. Whether adults are able to learn a language the way children do depends on what they have learned about learning languages. about the relative status of the language they speak and that of the language they wish to learn, and upon the intensity of their exposure to the language. Language learning is directly related to intensity of exposure; speaking a language seven hours a day produces learning at an enormously greater rate than taking a lesson a day and then retreating into one's own language. Sometimes a situation arises where a child refuses to learn a second or third language, but this is a question of using language learning symbolically, not a question of the extent to which any language can be learned by any human being, even one of quite low intelligence.

It is necessary to emphasize these facts in the United States because owing to the immigration situation in this country, children were taught to refuse to learn the language spoken by their immigrant parents. This in turn affected the language-learning capacity of those whose ancestors had immigrated much earlier. The dogmatism of our methods of imparting American English—"this is a *glass*, the French word for glass is *verre*, the German word for glass is *Glas*, Spanish is *vaso*"—means that we do not teach children that such nouns are simply the way in which speakers of a particular language refer to phenomena in the outer world, for which other peoples have equally "correct" other names. We teach laborious point for point translation, not a total interrelated system. We have only to compare the difficulty we have in teaching languages in American schools with the ease with which children who are expected to do so learn other languages —as in the Netherlands, for example —to realize that the expectations of teachers, parents, and peers set up conditions of learning or non-learning. We then mistake results produced under these conditions for measures of individual capacity to "learn languages" or for measures of the relative difficulty of particular languages.

If we are to have a global language that all can learn if they wish to communicate with people who speak another language, it must be a natural language, a language that has been spoken for centuries. It must not be presented as a language that will supplant one's mother tongue, but as a *second* language, to be learned by those who speak different languages, so that they can speak to each other.

Anthropologists and other social scientists, linguists, communication specialists, and educators concerned with teaching languages are all beginning to contribute to the discussion of a worldwide language. It was

After giving
female s
the arms are cra
but not rock
this means "daugh
rather than "bat





ofessor Sol Tax, editor of the inter-ional journal *Current Anthropol-y*, who recognized several years o that the time was ripe to propose rking on the question: we knew ough about the nature of language, out how languages were learned d could be taught, and we had e necessary technical equipment—day enormously refined in elec-onic recordings and language lab-atories. At a conference of experts lled by the Association for a World nguage (now the Council on Inter-itional Communications, Inc.), in 965, it was furthermore recognized at the time was not only ripe, but at we had reached one of those mo-ents in history where action was nperative or the chance could pass s by. Telestar and its successor com-unications satellites are the critical nventions that make it deeply desir-ble that people all over the world be ble to receive the same *spoken* mes-ige. The beginning of telecasting in ne language would provide a real eason for peoples everywhere to earn it. But technology will not wait. lready there are inventions that will nable simultaneous broadcasting in ve different languages. Once put nto practice, there will be a great in-estment in hardware for multilan-uage broadcasting, bringing into lay the linguistic chauvinism and mperialism of the speakers of the reat languages.

Today, most speakers of English, either as a first or second language, are hotly in favor of English as a worldwide second language. There are two main objections, however, one deep and the other expedient, to taking any great language for a world language. If one of the great languages begins to sweep the world, it will come into competition with other great languages; speakers of these will then attempt to wipe out all the smaller languages within their particular orbits in order to preserve and promote their own languages. Instead of 2,800 different languages, each distinctive and rich with meaning for those who speak it as their mother tongue, we will have a gradual acceptance of a foreign language by millions of speakers of less widely used languages. Human culture will be poorer, and millions of people will be condemned to a kind of secondary citizenship. Forced to function without a true mother tongue, they would risk hearing no lullabies as infants, writing no poetry in adolescence, engaging in no impassioned oratory as young people.

The expedient objection to adopting an existing great language as a world language is political. The non-European world will not, in the present climate of opinion, accept a European language as the second language of the world. This is, we believe, a completely valid objection to the adoption of English, French, Russian, Spanish, etc.

If we are to have a second language rapidly adopted on a world scale, what are its criteria? It should be a natural language. It should be a language that has been written for a long time so that difficulties of orthography have been at least partially solved. It should be easily transliterated into other scripts. It should not be a European language. It should not be the national language of an important political power, a choice that would induce inevitable political rivalry. It should be as slightly as possible identified with one religious or ideological position. There should be a large number of literate speakers who themselves are fluent in the principal languages of the world, so that they would be available as translators and teachers. At the present point of search, Armenian, for example, is a language that meets these criteria.

It may be asked, Why should we take a full-bodied, complicated, rich natural language as a second language to be spoken all over the world? Can we not instead adopt a lingua franca, or at least make whatever language we choose into a lingua franca. Studies of pidgin and creole languages suggest that we should not do so. It is true that those who have learned creole as a second language are in a position of what Alan Lomax has called "communication equity." In the same way, an English-speaking person using New Guinea pidgin to talk to a New Guinea native whose mother tongue is one of that country's some 700 different languages does face the New Guinean as an equal, and this can be accomplished in no other way. But the minute New Guinea peoples abandon their own languages and take up pidgin, as they tend to do, the equity vanishes. Pidgin, or Neo-Melanesian, then becomes the new but impoverished mother tongue of one group, and is therefore foreign to the other. Only a language that all speakers must learn with an equal expenditure of effort and which re-



A circular sweep of the right hand, after first positioning the hands for "advise," signifies the word "influence."

mains a *second* language—neither swallowing up a less influential mother tongue nor being swallowed up or corrupted by the more elaborate language on which it has drawn—can produce and maintain communication equity around the world. Such a second language should, however, have the lingua franca capacity to absorb new words with relatively little alteration, from whatever source, and should have the flexibility that Yiddish displays in different Euro-American settings.

A world second language, like a world system of glyphs, requires universal acceptance to work at all. Until such acceptance, experimentation, temporary solutions, and intensive research are necessary. Casting the die for one language rather than another will be as decisive as putting a new system of mensuration around the world. Failure to do so will be terribly expensive, as failure to adopt the metric system proved to be.

An Invented Language

Our third great requirement is for a written form of communication independent of any of the languages of the world, but dependent upon the concepts essential to high-level philosophical, political, and scientific communication. Where the worldwide second language must be natural, formed over time by unconscious human interaction, a worldwide, exclusively *written* language must be artificial, consciously developed, rigorously tested by logic and experimentation. We have, of course, many such partial artificial languages now: in the Arabic numeral system, in chemistry and physics, in engineering diagrams. But the most complete model we have of a written language that is independent of particular languages is the classical Chinese system of writing, through which two educated men, who cannot understand a word the other speaks, may nevertheless communicate fully with each other by writing. The Chinese characters have developed historically. They are not logical and too many of them are needed for full communication; they are heavily laden with the conceptions of Chinese thought acquired from serving 4,000 years of high civilization. A satisfactory system of ideational writing would require a system freed from the accretions of history, although it would not be necessary for the signs themselves to be devoid of historical origins. The contemporary symbols used in biology for male and female were once as heavily laden as a Chinese character: the male is the sign of Jove, the female of Venus; attempts to combine them visually are esthetically unsatisfactory, for there is no logic in the directionality of the two attachments to the circle signifying a human being.

The best model we have for such an ideational language, outside of mathematics and the physical sciences, is that part of the language of the deaf which conveys concepts independently of the words of a particular language, and makes it possible for deaf students from different language backgrounds to communicate with each other. Deaf "signing," to the extent that it uses artificially constructed visual signs, does in action, in face-to-face communication, what a written ideational language could do for speakers of differer languages.

Various prophetic forerunners c the future are beginning to exper ment with such a language. Charle K. Bliss of Australia has made on of the most extensive attempts. A even less abstract attempt was re ported recently by Jean Effel, a Pari newspaper correspondent.

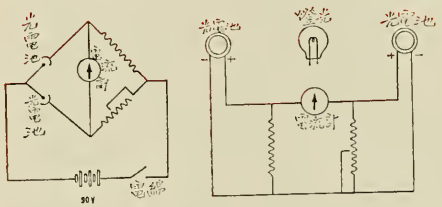
This need is as great as the nee for a worldwide secondary spoke language, but it must be recognize that the steps toward each and th demands that each must meet ar almost antithetical. For the spoke language, we depend upon a natura historical process. We need a lan guage that a people has learned with in the natural human setting, and w will need to teach it the same way with maximum exposure and mini mum initial analysis. For a world wide, high-level written language fo efficient communication among th educated, we must depend through out on a conscious exercise of man's most disciplined powers of analysis and invention, and upon controlled experiment.

We need glyphs for the child, the neophyte, and the stranger who can neither read nor speak the language of the place he is visiting; we need a worldwide spoken language that will enable people to talk to each other when they travel and to understand broadcasts from anywhere in the world when they are at home; we need a highly abstract, elegant, inductively developed, logical, artificial written language that the educated can read and in which they can write to, and for, each other.



With all three we could take full advantage of our new mobility and share in the kind of relationship once available only on "the village green"; and educated men and women, whatever their mother tongue, could exchange—efficiently and unimpeded by historical nuances—the highest developments of human thought.

There is a further problem that will attend the scientific and humane development of these new world needs. Those who first diagnose a situation have to face great opposition and ridicule, and they develop strongly defensive attitudes. Where there is no hope of success there need be no compromise. Each exponent of each variation in the proposal for a universal language or a new alphabet or a new system of glyphs has tended to be fiercely partisan. Tremendous energies are expended in internecine battles, which in the case of the proposed new languages is said to have once left three of them with only a single advocate each! When the next step is reached, when the dream becomes a reality, a different group of people must take on the tasks and approach them with the appropriate research tools, provided by a knowledge of science, the arts, and politics. This is difficult for the dedicated enthusiasts who have given unappreciated lifetimes to their special causes. It is also expensive for those who now see a chance to introduce a needed change in society. They too may be treated as fanatics, and they will encounter blind and uncompromising partisan opposition from their precursors. How to overcome this dilemma is a social science problem in its own right.



Electrical engineering has evolved simple symbols—for batteries, condensers, etc.— that are now recognized and used internationally.

icated Chinese who cannot speak each other's nacular tongue can nevertheless "converse" by writing. ch Chinese character carries a heavy burden of torical development, however, and a great many are ded for full expression. Biology's symbols male and female also have historical origins; y do not logically represent the human form.

