



Semantography Series 183.

PROFESSOR STUART C. DODD'S

MODEL ENGLISH AND TILP

Next to Professor Oliver L. Reiser of the University of Pittsburgh, I owe my thanks to Professor Stuart C. Dodd of the University of Washington, Seattle, for his kind interest in my work. He brought it for his university and for his private library. He induced the Linguistic Society of his university to extend to me an invitation of a lecture - the first and the only such invitation I had received from an American University. Thus his treatment of my work and myself was the best medicine I could get to heal the wounds I had received from the treatment of most of the scholars who had heard about my work or whom I approached. His kind letters to me will be found in my files, should a future researcher want to read them. Herebelow are a few excerpts from some of his letters to demonstrate the kindness of a scholar towards another scholar who bears the stigma of being an outsider of a university and advocating an idea outside the orthodox university ideas on human communication.

Dear Mr. Bliss,

"I have been referred to you as one who is interested in the development of a more universal analytic language or writing system. I would very much appreciate you sending me any offprints of material you may have published along these lines, or references as to where I might find them."

"Your letter of September 6, was a delightful experience. I enjoy finding a person of such mutual interest."

"Two batches of material have come from you, and I have been studying them and giving them some circulation. I am increasingly impressed with the ingenuity and the applications of your system."

"If you were to get Fulbright aid and come out to this country, we should certainly want you to lecture or to take some seminars to present your system before appropriate groups in this university. Our Public Opinion Laboratory or Sociology Department or one of the other linguistic departments would be glad to sponsor whatever public lecture or technical representation may seem appropriate. We could not guarantee any financial aid. It is possible however, if your trip was assured, that we could arrange through our Extension Department to provide some lectures and some small honorarium while in Seattle."

"Through our bookstore, I am ordering a copy of your three volumes for myself and I have requested for our Library in the University to do the same. I share Bertrand Russell's and Oliver Reiser opinion that you have made a major contribution to world semantics."

"Thank you for your letter of March 8th. I feel very much kinship in spirit with you in the struggle to have new points of view in the discoveries of scientific linguistics become appreciated by people in the profession. To me, however, it is such a peripheral hobby that I have only published the articles and then almost forgotten about them and gone on to other research interests. With very little interest in promotion, as soon as the idea is communicated I lose interest in it and start thinking about something else that is more fun in its creative stages."

"However, I would certainly like to help in promoting your Semantography wherever I can, as I admire it greatly and believe that it may contribute to the world some way eventually. I will lose no opportunity in expressing this enthusiasm to any relevant people. Some scouts for the mechanical translation electronic projection or the Air Force were in my office yesterday working up a bibliography in this whole field. I gave them your three books and they are planning to order them for their library in that project."

"I was delighted to get your full letters and its two following notes and to hear from you after a long silence. Your interest in my "Tilp," and "Model English" is naturally pleasant. I wonder if you would send me whatever you develop in putting it in semantography symbols."

"I hope you will not become discouraged on the slowness with which society accepts new ideas such as yours. The more far-reaching innovations they are, the longer the lag in adopting them, very often. Keep up the effort to propagate it and let the evolutionary situation of survival of the fittest in the long run determine what will be selected for man's use in the future."

His friendly words must be viewed against the background of the letters I wrote to him in which I angrily denounced the teachers of language and the educators in general. In short, I attacked the very class to which Professor Dodd belongs, and I could well imagine ^{that} to be connected with me may not be a pleasant proposition for a professional educator. Nevertheless he proved a sincere friend in all my years of tribulations.

Professor ^{Dodd} is a sociologist and director of the public opinion laboratory of Seattle University. He has made two great contributions to human communication, his Model English and his Tilp. Model English or "Ruly English" as he called it to contrast it with the present "unruly english" as taught at all schools and universities, is the answer to my prayer for a spoken language to conform with my semantography. When I started out, I hoped that Basic English will provide the spoken words to be attached to my symbols, thus making English the international language of mankind (which it is already in part). As explained in my book II p. 222 and Sem. Series No. 47 and 176, I found that Basic English can not fill this need, because of the round-about way forced on the speaker by C. K. Ogden. He insisted that there were no verbs in Basic English only 16 "operators" as be, have, do, make, etc. Consequently you can not say in Basic English "I know". You must say "I have knowledge". Dodd stuck to the "I know" and in addition he said "I did know" making a rule that the past is expressed in Model English always by the addition of did to any verb.

Thus Model English becomes an ideal spoken English for my symbols which too are a ruly language with no exception to the rules.

In his letter to me (March 22, 1960) Professor Dodd reports on his first acceptance of Model English.

"You may be interested to know that machine translation is very far from being a hopeless proposition. Professor Erwin Reiffner in our University here has pretty well solved the scientific problems and has a considerable appropriation and staff working on the engineering and commercialising problems with the electronic computer people. They can already translate by machine simple texts with limited vocabularies from Russian to English. My "Model English" is the basis for part of this translation work as it means the clerk can punch into the machine from the newspaper copy, say, a regularised version such as "I did go" instead of "I went" which the machine can then handle with ease. So I am not as hopeless as you are about these forms being actually adopting in the future, although it may be decades off in large part. My "Model English", in its early form called "Ruly English" (in contrast to the unruly english we usually use) has been adopted by the U. S. Patent Office for reorganising their entire classificatory and filing and research system to put it on an electronic basis. I anticipate that future reforms in language will come in the engineering and mathematical and scientific fields first, where their utility is most obvious and resistance least, and will gradually percolate across into wider uses and finally into folk usage in perhaps a century or so. As you say, the conservative academies will be the last to officially endorse any changes in their beloved and sacrosanct language, whether it is French or any other national language."

During the last 9 years Professor Dodd has sent me all publications on his Model English and Tilp (see later). With his last letter he sent me the text which was incorporated in the book, MACHINE TRANSLATION OF LANGUAGES by Locke and Booth (John Wiley and Sons, New York and Chapman & Hall, London) and which I reprint herebelow.

MODEL ENGLISH

An example of a national Language regularised
for machine translation
by Stuart C. Dodd

Author's note: This chapter is entirely written in Model English.

This chapter will describe some of the rules for a model language for purposes of machine translation. English will be the example in applying the rules. The purpose of this set of rules be to enable an electronic machine to translate swiftly from Model English as an input language. A good typist trained in rewriting English into Model English can translate mentally with little loss of speed while typing an ordinary English text onto the cards or ribbon which actuate the electronic translator. This amount of pre-editing may prove cheaper and more feasible at first than building machines which be capable of handling all irregularities of a language without a pre-editor.

Rules for Model Languages.

A "model" language will mean here any language in which the rules for regularity and familiarity have been jointly maximised. The regularity and the familiarity classes of rules be here operationally defined by the ten ideal rules below. This set of rules specify our theory of model languages;

FAMILIARITY rules for model language.

1. It should include the most users: i.e. it should maximize the numbers of persons who can use it in the world's population.
2. It should include the most used words: i.e. the words, etc. of most frequency in the standard form of language.
3. It should include the most useful words - it should include most of the meanings (referents) of ^{the} standard language.

REGULARITY rules for changing a folk language.

4. Every word should have just one order: i.e. one sequence in a sentence.
5. Every word should have just one meaning: as an ideal seldom realised.
6. Every word should have just one form: i.e. uninflected particles: e.g. be for all tenses and persons of the copula.
7. Every word should have just one pronunciation: the dominant one.
8. Every word should have just one spelling: preferably phonetic.
9. Every letter should have just one shape, such as the lower-case printed shape.
10. Every letter should have just one sound: such as in ^{the} international phonetic alphabet.

-one-

This ten rules spell out the semantic ideal of "one-word/meaning" or maximum one-to-one correspondence of a symbol and its referent. Only rules 4 - 6 calling for just one word order, meaning, and form will be necessary for mechanical translation, and so will be chiefly discussed here. The three familiarity rules and the four remaining regularity rules will be discussed elsewhere.

Each rule will be further operationally defined by a per cent of fulfillment or statistical index which can measure the degree to which that rule or ideal did be attained to date in a specific language. Thus model English can become one hundred percent uninflected particle as below described. Similarly, the other nine rules be maximally attainable in Model English.

The two kinds of rules will be kept in balance. A model language will seek the most familiarity that be possible for combining with the most regularity. The standard forms of any national languages, such as current English, represent the extreme of familiarity and great irregularity. A logical artificial language such as Esperanto (or still more our Tilp, or most of all logic and mathematics itself) represent the the opposite extreme of unfamiliarity and regularity. At the irregularity extreme a language may have as many rules as it have variant uses; at the regularity extreme it might have only one rule; therefore, the number of rules needed will be one measure of the position of a language on the continuum between the poles of familiarity and regularity. The ten rules and their subrules described here specify the balance in model English between the familiar and the regular more exactly.

The two classes of rules should be equally maximised both in theory and in practice. The rules below state the theory, writing texts in model language put the theory into practice. To do this, we write the text of this paper entirely in model English to show how the theory of semantic models will work in practice. To further empirically test this theory a former paper describing model English did be writed entirely in model English and then successfully translated into various European and Asiatic languages (but not in the ^{model} forms of these languages since Model Chinese etc. have not yet been developed).

We use the regular model English, using rules, 1, 4, 5, 6, 7, and 9, (this can also be called Ruly English or Rule Obeying English, in contrast to standard unruly English). We shall not here follow rules 2 and 3 which limit the vocabulary to a few most used and most useful words, since the rate of increase in storage capacity of computers indicate that by the time machine translators may be constructed they can hadle millions of words. We shall not here follow rules 8 and 10 which call for phonetic spelling and phonetic letters, since machine translators can readily handle the present standard spelling and the English alphabet.

Since the omitted rules decrease familiarity and since the increase of regularity be not needed by the machines, they be not followed here. Here we describe only "simple English" - one of these three subclasses of model English - as follows:

Simple (model) English - with grammar regularised

Simpler (model) English also have a limited vocabulary

Simplest (model) English also have phonetic spelling

A warning to the reader may be helpful before describing the three rules for a single word order, meaning and form. The rules here may need much refining by linguistics experts. The author be an amateur in this field. He did develop model English as a by-product of dimensional analysis in sociology which did lead to studying semantics. Dimensional analysis when applied to language, did result in inventing Tilp and the more dilute but immediately more useful model English.

But the detailed rules below may have some aspects which seem naive to linguists. To get them help in improving it, for possible use in mechanical translation, be a major aim in presenting it here.

Rule 4 - One Word Order.

The over-all semantic rule of maximising the one-to-one correspondence of symbol and referent mean that the order of the words in a sentence should tell whether each word would be the subject or verb, or object or modifier, etc. To fix the meaning of the word order, we first, as usual, list the variant word orders used in English and choose the most used order so as to maximise familiarity. Then we standardise this word order as the only one permitted in order to maximise regularity. This twin step^s seen to result in the four following rules for word order in model English.

4a. Put the subject first, then the verb, then the direct object, then the indirect object.

4b. Put adjectives, verbs, and auxiliary verbs before whatever they qualify e.g. "We will always speak this way."

4c. Put all other qualifiers, such as the suffix particles (es, er, ed, ing,) phrases and clauses, after whatever they qualify: e.g. "The speakers who do otherwise be breaking the rules of model English."

4d. Put the subject after the verb auxiliary in question: e.g. Did he say this? Do you understand? Will she do it?

(Refinement of these rules may be needed to cover unusual or borderlines cases.)

Note that this will make English a more flexible language, in that a word may be used as different parts of speech - as nouns, verbs, and adjectives etc. Thus a noun or a pronoun or verb become adjectives if put before what they qualify e.g. doorman, we group, (for our group) fly boys, Words may be clearly used as verbs if they connect the subject and the object and have auxiliaries of a verb e.g. He will chair the meeting, We will tea at four today. Gossip may black a reputation.

As usual we get more regularity by forcing everything under a few rules but with great loss of familiarity. The rules 4b. and 4c. might be combined into one rule: "modifiers follow what they modify." But using this rule will give unfamiliar sequences like Particles, adjectives, and verbs, in English put will be in order unfamiliar every.

To measure the degree of fulfillment of this rule in any text containing N words, count the percent of words, that conforms to the rule of the word order.

By this index model English can score 100 per cent in following the word-order rules without exceptions. This index complete the identifying operational definition of a single word order.

Rule 5 - Just One Meaning for Each Word.

The semantic rule "one symbol, one meaning" be an ideal which can be approached, but seldom can be perfectly and permanently achieved. For words may shift their meaning and may develop multiple meanings. This may require qualifying adjectives to distinguish between meanings, as in the statement "When you say How funny, do you mean funny ha-ha, or funny queer?" Thus the new meaning of tank, whenever the context did not make the new military meaning clear, may require a phrase like army tank to distinguish it from familiar water tank.

Of course, systematic ambiguity, multiple meanings, highly inclusive concepts have their uses in language and literature. But for purposes of exact communication a single well-defined meaning for any word or phrase be the ideal. To carry out this ideal, use such aids as the Basic English Dictionary, which select the chief meaning of each of 40,000 words (and define in terms based on the 850 basic words.)

For machine translation purposes, words can be coded with multiple meanings of course, but the machine must have some instruction, from a subcode or from a context as to which alternative meaning to act on. The supplemental codings in effect carry out the rule of "one symbol, one referent."

To measure the degree of fulfillment of this rule in any text will require counting the words and the meanings, to compute an "unequivocality index".

The numerator of this index be the number of words in the text at issue times 100. The denominator be the sum of the words when each be multiplied or weighed by "rank", of it as to multiple meanings. This rank be 1 for the first meaning of any word: the rank be 2 for each recurrence of that word with a second meaning: the rank or weighting coefficient be 3 for each occurrence of a third meaning: etc. This unequivocality index will be 100 per cent if every word have just one meaning. The unequivocality will sink below 100 per cent if the proportion as multiple meanings recur.

This index will constitute the identifying type of operational definition of unequivocality for it will identify exactly how much unequivocality characterise a particular text. The other type of operational definition - the generative definition - be the use of the dictionary above - since this can help the operator to produce an unequivocal text.

Rule 6 - One Form for Each Word - No Inflections.

The semantic rule for seeking the most full one-to-one correspondence of symbol and referent will call for the forms of grammar to be completely analysed into variant particles, each with constant meaning. This will mean that words will not be inflected by affixes or other change of the word form. All grammar will be showed by uninflected particles or syntax words in combination with substantive words. This particle for any item of grammar can be selected from the great variety of usages in standard English, so that no unfamiliar neologism will be needed. How this will work will be spelled out below for inflections of case, number, person, degree, tense, voice, mood, participles, nouns and verbs.

CASE The general rule, used throughout model English, that words become regular, not by inventing new forms but by merely choosing the rule-obeying forms out of wealth of different uses in current English, may be showed in the possessive case. We express possession in three ways: by 's, by of, or by the adjective, as in the adjective's use, the use of adjective, use. In order to replace inflections with uninflected connecting words and name words, we may use the last two ways only.

Since the direct object always follows the verb (by rule 4a) it need no change in ending. This, in English mean replacing the pronoun us, him, whom, her, then, by we, he, they, who, e.g. I love she. The indirect object would have the connecting word to in front of it, e.g. I will send he to she.

NUMBER The plural ending might be made a separate word - the plural particle -es meaning more than one of... in model English. Then, as a yielding to familiar habits, joining it to a noun, as in current speech and writing might be permitted. Then the only unfamiliar use would be making the irregular plurals regular, such as child es (elided to childs) for children, woman es (elided to womans) for women, thises for these, thats for those, etc.

PERSONS To get rid of inflections of person from the English verbs we need only drop the unnecessary s in the third person of the present tense and extend one form to all persons in certain irregular verbs such as have for has and be for am, are, and is e.g. he go, he see, he have, he be, etc.

DEGREE The unchanging words more and most or less and least can easily be used for the degrees of adjectives and adverbs.

TENSE Take the present tense as the verb, and let it not be inflected. The perfect tenses can be restated by such words as already, before, that etc. e.g. He will come before then, for He will have come. The present tense would not be changed even for number or person, and the future tense would take will, while the past tense would put did before the verb. This use of did for the past tense will extend to all sentences which contain "not" or a question or a strong statement i.e. I did go, for I went, as in I did not go. Did you go? and But I did go. This makes every past tense regular. Thus taught will become did teach, was, and were will become did be, had will become did have, etc.

THE PASSIVE The verb be with the passive participle -ed can express the passive voice as at present, e.g. I be loved, He will be loved, She did be loved.

MOOD etc. The present helping verbs, do, may, let, can, could, would, should, ought, must, with the uninflected main verb, can express all moods and other shades of meaning of a verb. The infinitive with to can usually be replaced by the words which mark a noun, namely, the used with a participle i.e. to act become the acting, to be loved become the being loved.

PARTICIPLES The two very useful participle endings ing and ed can be separate words, meaning, when standing alone, the acting of a verb, and the object acted upon. Again, to keep as much of the familiar as possible, this new words might be permitted to be joined to the verb so that one can write and speak they as at present. Ed, the passive participle will get rid of all that be not regular in verbs through introducing some forms which be not familiar to most people, however natural to children, such as speaked for spoken, savd or sayd, for said, rund for ran, etc.

NOUNS FROM VERBS etc. The participles be verbs to adjectives and, like other adjectives, may be changed to nouns by putting simply the before them: e.g. the loving, the loved, the good, the true. This make many of the noun endings such as -tion, -ment, -ence, -ness not needed. The verb roots of such words (adjective roots in the case of -ness) should be in the model English list, and then

adjectives and nouns can be made easy and regular by the separable words ing, ed, er, and the. e.g. the paying for the payment, the acting for the action, the existing for existence, the bad for the badness.

A fourth joinable or separable word be er, meaning the actor. It will change a verb into a noun of agent, e.g. doer or do er, writer, eater, seer.

VERBS FROM NOUNS OR ADJECTIVES. A noun or an adjective may be used as a verb if the meaning be clear, because of its position between subject and object or because preceded by an auxiliary verb or followed by a verb particle: ing, ed, en, e.g. Caves house the refugees, I sweeten my coffee, They will shrapnel the area.

Rules such as these can make English as free of inflections as Chinese or the most model artificial language. The four basic particles, or separate but joinable words, er, ing, ed and es when joined to verbs (to nouns in the case of es) will combine being separable words with the familiar current use. Such affixes as un for not as in uninflected, (en as to make as in redde), ess, (for the feminine as in lioness), may be called particles or separate words which may be joined in use for familiarity. Thus the sixth rule, that every word should have one form and one form only, can be 100 per cent satisfied in model English.

Summary.

For mechanical translation, a model language may be useful at the pre-editing or post-editing stages or both. Model languages here mean any national languages which have maximum regularity while keeping maximum familiarity. More exactly a model language be operationally defined by the ten rules and subrules stated here and illustrated in the case of English. All the rules here spell out the general semantic ideal of one meaning for any symbol. Of the ten rules, the three most needed by the machines be that words should have just one order, one meaning, and one form of grammar. Model English can achieve one hundred percent regularity, by standardising: (a) the chief word order, and (b) the chief meaning of each word, and (c) all inflections of grammar by using particles (which be invariant syntax words like es, er, ed, and ing, for the plural, the actor, the acted on, the acting, respectively.)

Model English can also keep a high degree of familiarity by choosing the rule-obeying forms from the many variant usages in Standard English. We did write this paper about Model English entirely in Model English to show how much familiarity can be combined with complete regularity in a model language.

REFERENCES.

1. For further description of model English for general international auxiliary language use, see S.C. Dodd "Model English" Gen. Sem. Bull, nos. 8 and 9 fall and winter, 1951 and S.C. Dodd Systematic Social Science, offset edition University Bookstore, Seattle pp. 679 - 685, 1947.
2. For these indexes see S.C. Dodd "On Measuring Languages," L. Amer. Statist. Ass, vol., 44 Mar. 1949.
3. See S.C. Dodd "Tilp" - a Ten Letter Alphabet of Meanings. Gen Sem. Bull. nos. 6 and 7, spring and summer 1951.

Prof. Dodd had sent me all his publications on Model English so I believe. Surely he would have sent me favourable reviews of it by competent linguists. So far, no linguist seem to have taken him seriously, except the few friends he has among them in Seattle University and elsewhere. I have castigated the caste of linguists in every letter I wrote to him. From the excerpts of his letters you see that he agrees with me, though he uses polite terms which draws away attention from the real culprits. Take for instance the last sentences in his letter which I reguote herewith.

"I hope that you will not become discouraged on the slowness with which society accepts such new ideas as yours. The more far-reaching innovations they are, the longer they lag in adopting them, very often. Keep up the effort to propagate it and let the evolutionary situation of survival of the fittest in the long run determine what will be selected for man's use in the future."

Does "society" refuse to accept new ideas? After all, "society" represents the children and adults of a nation who are taught and told how to use language - or else. And else means bad marks in school, no admission to a higher school, and ruin of all the hopes of a young man or woman. If teachers of language would agree to adopt some of Dodd's innovations year by year everyone would adopt them gladly, because not adopting them would mean being contrary to the teachers and this would mean "or else" as said above.

And what about Dodd's reference to the evolutionary situation of survival of the fittest in the long run. Is it a true appraisal of the forces which mould our speech? Not at all.

The teachers have proved themselves the very opponents of every evolutionary movement for a better language. The irregular verbs of Greek and Latin and French, and English and all other languages have been preserved and defended with the "or else" stick of the professional educators, who in England and elsewhere used the stick and the cane freely to blow the irregularities into the behinds of the youngsters.

Then who are the evolutionary forces which bring a better and simpler and more logical language about? To this Professor Jeperson, one of the greatest linguists of this century, gives a convincing answer. "The children", he said, "They make mistakes so many times, they say cow and cows instead 'kine' so many times until the adults realise that the children talk sense and the teacher talked nonsense all the time."

As the profession of linguists pretend to ignore Model English, though it has advantages which any child can grasp, what are they saying about Dodd's other linguistic creation TILP? Do they take the time and trouble to study it? As far as I know, they don't. In order to understand their silence, or contempt, or perhaps fear, it is necessary to know that Tilp is the most phantastic attempt in this field, the reduction of more than half of our language to nothing more than 10 letters of the alphabet. In order to understand the revolution which Dodd advocates, I shall quote paragraphs from his latest article in which ^{he} mentions also my work.

EXCERPTS FROM

AN ALPHABET OF MEANINGS FOR THE ONCOMING REVOLUTION IN MAN'S THINKING Stuart C. Dodd.

"I. MAN'S COMMUNICATIONAL NEEDS ARE EXPANDING.

The title of this paper suggests that such a profound, widespread, and rapid change is taking place in mankind's symbolising habits as to be called a revolution. But what is the evidence that the peoples of the world are embarked on such a revolution of their semiotic habits - their customary inter-relatings of symbolisers, symbols and the referent symbolised? (footnote

Semiotics, the study of symbols (and hence most of Communicating) includes three branches, namely:

Semantics as ^{the} relations of symbols to their referents or meanings thus including most of language;

Syntactics as the relations of symbols to symbols thus including grammar, logic and mathematics;

Pragmatics as the relations of symbols and the symbolisers thus including all speech behaviour and much of social psychology and aspects of sociology.)

One evidence is implied in the enormous increase in the variety and volumes of the world's communicating in this century. The new mass media of movies, radio, and television have been born within our lifetime and are becoming used, singly or together, in some degree by most of mankind. The variety and volume has increased manyfold for communicating in print and by mail, by telephone, telegraph and cable, by person in travel and public speaking. In the older mass media of newsprint, magazines and books, for example, the indices measuring the variety of topics covered, the frequency of issue, the pages of print, the number of writers and the number of readers all have gone up mostly by multiples of the 1900 figures in most countries around the world. Whereas the larger majority of the world's adults were illiterate in 1900, a large majority bids fair to be literate by the end of the century. Whereas most children of school age were without school in the 1900, most of them at the present rate will be in school by the close of the century.

With the world's multiplying education and mass communications, more people are probably using more vocabulary, reading and hearing more of their own language, and learning more other languages than ever before since man began to talk. Translation between languages has multiplied in press and broadcast and in simultaneous telephonic translation services at international conferences. The first electronic brains for multiple bulk ^{translating} are under construction. The world seems ^{covering} towards the use of fewer languages. The League of Nations and now UNESCO have made cautious moves studying the possibility of one auxiliary world language. Meanwhile English increases its lead in the world, especially since world war II. It is probably known to a larger percent of the world's population than ever spoke one language before. Wherever in non-English speaking areas schools teach a second non-official language, English is rapidly becoming the chief second language in most countries, even in Russia.

Along with this acceleration within the pragmatic branch of semiotics there is also profound, widespread, and rapid change going on in the other branches. Within semantics, the vocabularies of the world's languages are growing and changing with the vast development of sciences and technologies. A few whole nations have already changed their language greatly in one generation.

Thus Kemalist Turkey adopted the Latin alphabet and altered over half of its dictionary vocabulary shifting from Arabic to old Turkish roots till city educated parents had trouble reading their children's textbooks. Thus Israel effectively revived the modernised ancient Hebrew which was not the childhood language for most of her citizens. Drastic change of the language of a people, within one generation is now possible, if sufficiently desired.

Dialects are receding around the world as newsprint and radio penetrate into jungle and desert and ocean islands. The growing international pressure for a common language such as Esperanto and Interlingua as proposed reforming of language symbols for the myriad meanings man wants to express. Thus "Semantology," invented by an Australian, offers a new semantic system in a typewritable set of some 200 international signs which are verbalised in anyone's own language. Intended for universal use on highways signs at first, this analytic-synthetic visual symbolism compounded out of dots and straight and curved lines has expanded to claim potential, but still undemonstrated, usefulness adequate for textbooks and other such literature. The new discipline semantics is beginning to get academic recognition in courses and professorships and its two professional journals.

(footnote) Bliss, C.K., International Semantography, Vols. I - III (Sydney Australia., 1948) Semantography Publishing Company.

II. MAN'S LANGUAGE NEEDS MATCHING EXPANSION.

If one grants that man's communicating is undergoing an almost explosive expansion in this century, ^{our} next thesis is that languages in general are lagging in development. Our symbolic tools are not matching the growth of our need for better tools.

Fewness of symbols means a parsimonious or economical system. It means least cost or least effort in talking or writing. It means logical and mathematical elegance as when those disciplines seek to build their sub-systems using the fewest possible number of primitive terms and postulates.

By this standard of parsimony our languages are well below par. The world has hundreds of languages (thousands if more finely sub-classified) whereas the ideal for maximising efficiency of intercommunicating would be just one world language. Furthermore within each language there are many unnecessary symbols from useless synonyms to unpronounced spellings. Information engineers estimate in terms of "bits" that about half of the language in use is redundant. Putting all these together, it seems to us likely that mankind could express all the meanings now expressed with perhaps one percent of all the world's present number of written and spoken symbols. This estimate implies that ninety-nine of the world's symbols are now unnecessary and are increasingly becoming wasteful for human energy.

One lack here however, is the lack of standardisation or multiplicity of ways for forming new words. Standard rules for the growth of language would avoid much waste and ambiguity such as now incurred when using old words with partially new meanings.

Fixity of one-to-one relationships between symbol and referent, or constancy of meaning is our third standard of language. All current languages except perhaps logic and mathematics fall far short of this standard. (Though even in mathematical nomenclature there are relics of old ambiguities such as "one billion," meaning a thousand millions in America and a million millions in England.)

This standard is violated by every word that has multiple meanings in the dictionary as well as by every usage that is ambiguous, vague, or variable in meaning. An ideal language would have symbols each with just one constant referent which would not vary with speaker or hearer, with time or place, with purpose or context. The meaning of each symbol should be constant no matter who says what, when or where, why or how. This ideal includes, of course, having specific words for variables, for vague referents, and for partly unknown referents whenever one wants to communicate with variability, or vagueness, or state the speaker's ignorance.

In sum, the symbols of current languages are neither few, nor full in coverage, nor fixed in meaning. Modern languages are deficient by all three criteria. And these deficiencies, we argue, will become aggravated as the explosive expansion of human communication unfolds in this century.

What then can be done towards closing this gap? Can the structure of language be re-tooled to keep pace with its ever growing social functions? Can man's symbols, largely developed in the age of ox-carts, be streamlined somehow for the jet propelled thinking of the future?

III. AN ALPHABET OF MEANING CAN EXPAND THE LANGUAGE WELL.

To streamline language by making its symbols "few, full, and fixed" and so able to cope with man's rising flood of communicating, we repropose developing the alphabet of meanings.

This alphabet would seek to analyse into a small number all the meanings, all the referents or objects of thought, that man may think or say, now or ever in time to come. Synthesis of those few elements would then restore any of the original set of meanings and also yield almost unlimited numbers of new combinations, for expressing meanings men have never thought of as yet. Thus our present phonetic alphabet by analysing the sounds of a given oral language into a small number of elements is able to synthesise further sounds in hundreds of millions of further new words if wanted in the future.

This analytic-synthetic plan of attack has proven very practical and highly creative through^{out} semiotics and other sciences. Chemists have analysed all substances into some hundred atomic elements which recombine to yield all those substances plus all the newly created marvels of chemistry. Military administrators analysed all the diverse role-actions of men in the armed forces so fully that they were able to synthesise tens of millions of men in powerful military organisations in World War II. Mathematicians and logicians develop their sciences by analysing out ever more basic primitive terms, postulates, and operating rules by combining which they creatively develop their growing semiotic sciences. Linguists, less thoroughly, have analysed language, as in Basic English, down to a thousand most useful words (out of the million or more available in standard English) and then combined them to publish the Bible, for example, as a synthesis of those thousand linguistic elements.

But our proposal to develop an alphabet of meanings goes far beyond any current analysis in any semiotic science. It goes far beyond the analysis of any logic and mathematics in extending to all of a language and to all languages. It goes far beyond the analytic or artificial languages like Esperanto, Ido, Romanol, Lingua Franca, Interglossa, Interlingua etc., and of simplified national languages like Basic English and Model English. In that our proposal starts where they leave off. They analyse words down to current roots and affixes in some existing languages and regularise their recombinations. Our proposal starts from those roots and affixes and analyses them into a much smaller number of elements. At present it seems that just ten elements are needed to do, at least, half of the job. In achieving such a small alphabet, we believe our proposal goes beyond Leibnitz project for such an algebra in his New Essays Concerning Human Understanding though our proposal is essentially his dream.

IV. AN EMBRYO ALPHABET CAN NOW BE EXHIBITED.

Our argument that all mankind's thinkable thoughts can be expressed as compounds of a few elements of meaning, or unit symbols for all possible referents, needs clinching by exhibiting a set of elements that promise to do the job. Let us therefore look at our embryo interlanguage called "Tilp" which was invented to explore this reductive possibility.

Tilp is a set of ten elementary meanings. They were chosen from extensive trials to be a "most useful" set in that their combinations yield about half of human speech as described below. They are a small enough set to be symbolised by ten letters, or by the ten digits, or by the ten fingers, or by any other decad of visible, audible^{signs}. In order to make Tilp both a writable and speakable language. For by including a meaningless letter, e, for euphonic purposes the ten lettered meanings of Table 1 can be strung together in pronounceable compounds. These compounds are built up as the equivalent of current words in any language (as illustrated in the sample dictionary Table 2). The rules for combining these ten elements and comprising the grammar of Tilp are also exhibited (Table 3) followed by an example of a prose paragraph paraphrasing the Lord's Prayer (Table 4).

The ten "dimensional" elements of meaning offered in Tilp are tabulated in Table 1. Each letter element has two sub-meanings denoted by its position as a prefix or postfix (attached to e or to any letter-element). The ten are sub-classified in three "levels" as qualitative elements, quantitative elements and relational elements. These levels are Kant's "categories" stemming from Aristotle's set of ten categories. They are symbolised by exponents of 0, 1, and 2 respectively in our dimensional analysis of human behaviour. They sub-classify respectively the universe of all concepts or meanings on the basis of form into kinds, degrees, or relations of whatever content may be denoted.

Within the qualitative level, Tilp has standardised four subcategories namely "space" and "time" as universal to all the sciences and to all existence; "people" as the most distinctive and observable^{sub} category for all human behavioral sciences; and "all else" as the complementary class (i.e. all not time, space or people.) This residual category of content is to be further subclassified, of course, as far as possible or needed to describe anything in any situation at issue. Meanwhile it serves as a guarantee that our symbolic system is a perfectly closed

system since ^{by} definition there can be no concept, no symbol whatever, that is outside our system. It also serves as a convenient handle to deal with everything whether currently known or unknown, symbolised or symbolisable.

TABLE I

Tilp's 10 Elements as an Embryo Alphabet of Meaning - "Tilp ondek zer"		
4 qualitative elements	4 quantitative elements	2 relational elements.
t = time	o = negation	z = relative amount
t- = an instant	o- = "not" denial, zero	z- = less (than)
-t = a period	-o = anti, minus	-z = more (than)
l = space	n = 1	r = relative direction
l- = a point	n- = first	r- = to
-l = a length	-n = one	-r = from
p = people	d = 2	e = euphonic base
p- = a person	d- = second	letter without
-p = a plural	-d = two	meaning.
i = all else (not t, l, p)	k = 3	
i- = a factor,	k- = third	
an adjective	-k = three	
-i = a product, a noun.		

The quantitative level in Tilp uses four elements (although only two, 0, and 1, are essential and although, on the other hand, all ten digits are often convenient). These four elements are negation (=0) "one" (=n) "two" (=d) "three" (=k) each twin subelements as noted in Table 1. The relational level in Tilp uses two elements dealing with relative amounts (=z) as "less" and "more" and with relative direction (=r) as "to" and "from".

With this (or any other) set of elements of meaning, rules are needed for combining them. The algebra of sets provides such rules. Chiefly the rule for forming a product of two sets (called their "inter^{sect}") is involved. By it, any element of meaning may be "multiplied by" any element, forming what may be described as an "association" or a "joint occurrence" or "combined meaning" or "logical product" or "pair relation" or "conjunction". This is symbolised by juxtaposing the letters as in any algebraic product. Thus the English word "some" is "oz" in Tilp which is formed as a product or joint meaning of its two elements "o-" for "none" and "-z" for "more than" yielding "some" as "more than none".

For other examples of word building by forming logical products or pair relations of elements note how the personal pronouns may be derived. Since "n" stands for "first" and "-p" stands for people or persons their product including the euphonic factor, e, is "nep" meaning "first persons" or "we". By including the factor "-n" for "one" the singular of the first personal pronoun "I", is the product "nepen". Similarly for the second persons "dep" meaning "you" is built of a joint occurrence of "d" for "second" and "-p" for "persons". In the same way, "kep" and "kepen" from "k" standing for "third" mean "they" and "he or she".

The singular and the plural numbers simply call for the "factor" "n-" (or en if alone) for "one" and "-nz" (or "enz" if alone) for "more than one". The comparative of any adjective or adverb is denoted by "iz" which combines "i-" (something) and "-z" (=more than). The superlative reduplicates the comparative by saying "iziz" for "most" meaning "more than more" as children in some languages say.

The three tenses of any verb illustrates well how compound meanings can be synthesised from analytic elements. Thus "-t" stands for a time interval (see Table 1) and this identifies verbs since every action requires a time factor. Then since "o-" denotes "zero", the product "ot" means literally "zero time" or a mathematical point in time. This can assert existence of anything at any instance of time as does one meaning of the copula "is" in English. So "ot" = "is", the copula in the present tense. Then the past tense "was" can be derived by prefix "z-" standing for "less" (of time) than the present instant. So "zot" = "was". The future tense asserts "more (of time) than the present instant" by inserting "-z" to get "ozt" as meaning "will be". Finally any verb can add "zot" "ot" or "ozt" to denote respectively its past, present or future tense.

(I cannot bring here the full text and the tables presented in Dodd's essay and I direct the reader to write to Professor Dodd for complete information)

In Table 4 Dodd sets out to analyse the Lord's Prayer and transform it to Tilp. Here are the first words.

FATHER in heaven of us

Melenzep iele loopot ir nepz

Naturally, the words look strange enough, but surely not stranger than Russian, or Greek words, even when written in the Latin alphabet.

Throughout my publications I have always stressed the fact that Esperanto and any other existing or constructed language is difficult to learn, because the words are so utterly different from the words of our mother tongue. I therefore advocate the use of Semantography which can be read and written in one's mother tongue. I agree with Professor Dodd as to the difficulties in putting TILP into operation which he outlines in the last paragraph^s of his article, parts of which are quoted herebelow.

V. WHAT MAY BE THE COST AND CONSEQUENCES?

With this structure of Tilp on our mind as an alphabet of meanings in embryonic stage, let us try to evaluate some of its limitations and possibilities. What might be the chief social costs and consequences of developing Tilp, or any other equivalent alphabet, for thinking?

We see as the chief semantic cost, the research needed to develop Tilp to cover the substantive half of language. At present it covers the connective half of language completely and has suggestive but^uexplored possibilities for helping to analyze the substantive half. The "connective tissue" of language includes here all connective words as specified above, plus all grammatical inflections or parts of words.

A second major cost would be in drastically changing our speech habits - in any giving up of the familiar and well-loved circumlocutions we grew up with. This social cost can be reduced by the four techniques of making at least this part of the semiotic revolution (1) gradual (2) voluntary (3) advantageous and (4) desired.

Use of a semantic alphabet or analytic speech should be voluntary, increasing only if users prefer to use it. It could coexist with other languages just as mathematics coexists with folk speech each being used in spheres where it is used best. It is not an exclusive reform and may even prosper better in the long run if other current improvements and reforms precede it. Thus developing international languages like Esperanto, Interlingua or Model English may well be a desirable intermediate stage. Whatever groups had to choose en bloc as when all engineers in their schooling have to learn some mathematical language the usual large majority can be required for such decisions, followed^{HP} with a bilingual transition period for learning the new habits.

Any increased use of an alphabet of meanings (when better developed) would be because of obvious and immediate advantages to the users. Its use could grow, not by fiat or organised pressures, but by sheer general perception that one could communicate more precisely, and more flexibly, more comprehensively, yet more creatively yet with greater ease than was previously dreamed possible. Thus sheer intrinsic advantages diffused our Arabic-Hindu digit system displacing the clumsy Roman numerals even in spite of legislative resistance.

The first major consequence we see from analytic speech would be an enormous economy in human effort. If our estimate above that the present volume of communicating in the world could be done with something like one percent of our present symbolism to be learned, we could save some 99% of such effort. Reading and writing could be as painlessly learned before most children were six as their oral speech is now learned by mere exposure to such stimuli in the family. Think how many hours in grade school a child spends trying to learn to spell the vast volume of half haphazard irregular permutations of the 26 letters in our irregularly phonetic alphabet. With regular spellings or grammar or idioms, and with a vocabulary that expressed what one meant swiftly and surely a large part of school effort to teach the tool subjects could be economised and diverted to other educational needs. As more youth go to college and prolong their education well on into their twenties, the modern need increases for a semiotic reform that could greatly shorten (and also improve) the whole educational process for everyone. Alphabets of meaning and analytic thinking from infancy might allow young people to marry and start their families and careers when nature has matured them physically and mentally, nearer to their coming of legal age as citizens. A shortening of schooling of four years (which we believe a conservative forecast) resulting from analytic speech, if eventually universalised to the world's population of two and a half billion people could mean releasing for social purposes the extra productive power of ten billion man-years per generation. Figuring a life expectancy for some sixty-years, this could mean adding to humanity every year the productive power of a population equal in size to that of the United States today.

That analytic speech could reduce schooling markedly is suggested by a simple test of learning time. Experiments in learning Tilp showed its extreme ease due to the parsimony and regularity of its ten letter alphabet and its ten simple rules of grammar. Thus a one page summary of Tilp and a vocabulary sheet was given to five college students who had never heard of it previously. We also gave them standardised paragraphs of 200 words to be translated into English from Tilp (with English substantives) - a different paragraph on each of five successive days. These students were able to translate within half an hour with this Tilp semi-language.

Their speed quadrupled between the first and the fifth 200-word paragraph. What other language can be so swiftly mastered?

To this economy in schooling should be added the vast economy in daily talking or listening at which people spend an ever-increasing fraction of their waking life-time. For we believe that compared with current speech, analytic speech will say more with less wordage and with consequent less time and effort. How large this saving may be difficult to estimate in its present early stage of development. We see that most of our present speech is lumbering along like a creaking ox-cart, little improved in basic structure for several thousand years. We further see our future a streaking between communicators almost effortlessly like the frictionless electrons in electronics "brains", perhaps within a century from now.

Another large source of reduction in man's efforts needed to satisfy his wants (especially his mental and spiritual wants) may result in mass media. Suppose analytic speech and the analytic thinking it manufactures were eventually to reduce wordage by one and a half (for a speculative guess) without reducing the volume of meanings communicated. Such reduced wordage would reduce some of the costs and effort in writing, typewriting, and printing, in broadcasting, public speaking and sermons, and every agency for transmitting and preserving speech of humans.

Lest such estimates of reduced effort seem overly fantastic the reader should recall that we are not dealing with tinkering improvements in language but with revolutionary organising. We are dealing with shifts from hundreds of thousands of mental bonds between symbols and referents to a few score of such basic bonds. This is a reduction not down to fifty percent or so of present neutral patterns but more on the order of a reduction down to one percent of one percent. This revolutionary economy is comparable to the shift in writing from many thousands of Chinese-like characters down to a score or so of letters. To learn to write all of the Chinese ideograms would take most of a life-time whereas to learn to write a modern phonetically spelled Turkish is almost immediate to a Turkish speaking person upon merely learning the shapes and sounds of the letters in the Latin alphabet.

The second major consequence we see from analytic speech would be an enormous improvement in human communicating and thinking.

In support of the last statement one could argue that an alphabet of meanings should make language more versatile, efficient, precise, etc., etc., but instead of arguing over adjectives, we propose scientific testing by controlled experiments. Let the agreement-compelling power of crucial tests of exactly stated hypotheses be applied to evaluate Tilp as a scientific theory in the semiotic sciences.

As a final consequence we foresee from an alphabet of meanings or analytic speech as it might be called, is to help accelerate the mental and spiritual evolution of mankind. For we see man's biological evolution as going on slowly over the century while his cultural evolution, paced on by his symbolic systems, gathers momentum faster with each decade in this century. Our mental and spiritual development are highly dependent upon language and their symbols for their communication growth and preservation.

Consequently we believe that an alphabet of meanings, perhaps developed from Tilp, could revolutionise human speech and thinking and thereby significantly accelerate man's cultural evolving.

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T H E E N D.

Note: The content of the fourth paragraph above about Chinese writing highlights the tragedy of my work and my life. If Dodd, a man who got my books and my many references to the ease of Chinese writing, could say that it takes a lifetime to learn it, how can I ever hope that other Western educators will ever see the fallacy of this thought, born out of sheer ignorance. The fact is that Chinese children learn quicker the ideographs than the alphabetical words, and here is why. Children learn to say sky, rain, field, lightning before they learn to read these words. In the Western world children have to battle with the irregular pronunciations of irregular letter sounds as in sky, rain, field, lightning. But the Chinese children learn effortlessly to see the picture of the

sky rain field lightning strikes

In Shanghai I have seen children 4 years of age reading in street libraries something which simply does not exist in the Western world.

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