



DRAFT OF THE SPEECH

to be given on the 17th February 1955 in the Department of
Education before the Committee enquiring into Secondary
Education
on

SEMANTOGRAPHY

the Leibnitzian "Algebra of Thought"

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Note: The knowledge of the content of the SUBMISSION ON SEMANTOGRAPHY submitted to the Committee on the 14th October 1954 is essential to the understanding of this speech. There the history of this idea, the favourable comments by Bertrand Russell, Julian Huxley and other educators are mentioned. A number of examples are given to show the strange influences of words on our thoughts. These examples are dealt with in this speech.

Sydney 17th February 1955

Mr. Chairman, Ladies and Gentlemen,

I beg to tender my thanks to you for having given me the opportunity to expound my work to you. For more than 12 years I have worked and waited for just this moment, to speak before an official forum of educators. Now that this memorable moment has arrived I am most anxious to make this talk a success and to find your full understanding.

"Understanding" is the word

One of the words most used and most maltreated in the world in general today is the word "understanding." We must understand the Asians (but not the Asiatics, see my Submission, p. 4). And they must understand us, the Australians, but not the Australasians. We must understand each other. In Education we must understand the child, and we must make the child understand what we want to make it understand, among other things, also Understanding, and so forth. We realize that there are many blockages to understanding. The greatest obstacle is of course speaking (and thinking) in a different language which is completely incomprehensible (that is not understood) by other persons. We know today that even literal translation may mean breakdown in understanding. One of the aspects of my work aims at understanding across all languages. Anything written in Semantography can be read and understood in all languages, just as $1 + 2 = 3$ has the same meaning in all languages. But we are not concerned here with this aspect. In the schools of Australia only English is spoken, and we know today that understanding may be completely blocked even between people who speak the same language. We may think of the same thing and may use different words for it, or worse, we may use the same word and mean different things. All these problems are taken into account in the growing science of Semantics, and this is the aspect of my work of which I am going to speak.

The written and the spoken word

There are other strange influences which work against understanding. These differ with the written and the spoken word. These influences may indeed cause the breakdown and failure of my efforts to make this demonstration a success. In the Submission I got in touch with your minds by the written word. Now, for lack of time I am forced to do something which simply is "not done" in the world of letters. I am writing these notes for direct duplication without a draft, and without correction. In the same way I have written and directly printed the submission, and indeed all my articles, leaflets brochures, even my books. Consequently, they are full of errors. They violate orthography, syntax, grammar, and even logic. I simply have not the time to correct and re-write them. I have to make a living in other spheres. Now, you are educators and one

of your main tasks is to teach the children of a nation correct spelling, correct writing and overall neatness of presentation. It may well be that my written submission, containing all kind of linguistic errors and admittedly not corrected, might be offending to you and considered as an insult. It may well be that this fact could seriously block sympathy and understanding. All this refers to written presentation. The verbal presentation is fraud with additional hazards to understanding.

Hazards of the spoken word

Now that I have opened my mouth and said the first few words you know that I am not a natural Australian, born and bred in this country. I am a naturalized Australian and my mother tongue was not English. I am therefore much more in danger to commit errors in pronunciation, presentation and rhetoric than any person born and bred in the English language. Few people are good speakers. With the others their best ideas may go unheeded because they are unable to present them in well rounded phrases. In addition there are regional differences in the spoken word. When in England, I found that the Oxford accent is utterly offensive to Englishmen of other regions. Being a man from Vienna in Austria, I can assure you that for Viennese people it is almost sickening to listen to a talk given by a man from Berlin who speaks the pronounced Prussian accent. Then there is the volume of tone. Englishmen are accustomed to subdued talk. Now, unfortunately I am a bit hard of hearing and it may well be that any question put to me would have to be repeated twice until I have grasped the meaning. People hard of hearing are talking usually too loud and this is something which may offend sensitive ears. Understanding may be blocked just because of this. Lastly, I may be carried away by my fervour to present to you my own work, which may make an unfavourable impression of over-excitement. A lecturer who observes that his speech does not go well with his listeners may get hysteric. He feels as if an icewall is mounting up between him and the audience.

Two saying the same is not the same

Now, let us assume two speakers who are perfect orators, who commit no fault of presentation. Both give exactly the same speech. Yet one may be listened to, and the other's talk may find blocked ears. Why? The first may be a professional man with one or more degrees in that particular field of knowledge. He may even be a director of some institution. He may claim to be "competent", and therefore his words have "weight." But the other man may be equally competent, but without degrees and without professional and paid work in this field. He is then what the Romans called an "amator" a lover of some particular field of knowledge. Well, amateurs are usually not listened to by professional men. One of the first things by perusing a brochure or a book written by someone is to look for the professional qualifications of the author. Is he a professor, or a director or a teacher in that particular science? If he is not, whatever he says has simply not "weight." Yet, the history of new ideas in all fields of knowledge, indeed the history of science shows that amateurs have started it all, many years before paid professional chairs were set up. In certain sciences it took centuries.

Specialisation, a blockage to understanding.

Today, specialisation has gone a long way in separating men of sciences. Specialists claim competency in their own field, and usually refrain from judgements in other fields though these fields may go under the same heading, say chemistry, or engineering, or linguistics. I have found in my case this particular blockage to understanding as the greatest obstacle to make myself understood. As my work refers to linguistics, mathematics, logic, psychology, what weight have my words as I am not a professional linguist, mathematician, logician and psychologist? I am only a chemical engineer. It came even worse. As I approached professional linguists, mathematicians, logicians, and psychologists, some of them refrained to say something or do something about my work because it falls "outside of their sphere." Only those all-round men of knowledge, the "lovers of wisdom" (Greek philosophos) men like Bertrand Russell and others had the courage to speak up for my work in terms of highest praise. The Professor of Philosophy at Pittsburgh University, Oliver L. Reiser presented my work at an Annual Meeting of the American Association for the Advancement of Science in a talk on "Unified Symbolism for World Understanding in Science" (see Sydney Morning Herald January 1, 2, 1952). He spoke of the disastrous blockage of understanding among scientists and used these words:

"One of the consequences of the resulting over-specialization in education is the ethics of professionalism: the doctrine that only the expert has the right to speak on matters within the area of his specialism. Recalling the

statement that "an expert is one who studies more and more about less and less until he knows everything about nothing," it becomes clear that on this principle the size of the area in which a person is allowed to speak is day by day becoming smaller. In this case there is not an infringement upon freedom by way of totalitarianism; we have achieved a muteness by common consent."

More than 12 years of sometimes heartbreaking experiences have made me realize all those blockages to understanding which I have summarized in the preceding paragraphs. It is true, I do not make a living by teaching. Yet, I believe to be a born teacher. In the high school I tutored my fellow students. In the university I tutored whole classes of students in preparation for their examinations. They paid me for this, so I must have been good. I toyed with the idea to enter the teaching profession. But I was lured into industry by the greater opportunities offered there. Nevertheless I remained a teacher for the love of it. After a hard day of work in the factory I went to evening classes, educational halls, technical colleges and lectured there. I lectured and taught even in the terrible environment of the concentration camps in Germany and in the Japanese segregation in Shanghai. Yes, I think I am filled with the desire to give my knowledge to others, to be a teacher. Since my early boyhood I was filled with the desire to do something by which mankind would benefit. I realized that it will mean hard work. But I did not realize that I would find the greatest obstacles among the men whose duty it is to take kindly to new ideas in education and science. I am therefore grateful that you have given me the opportunity to explain my work to you. I feel sure that you will not be irritated by those influences against understanding which I have listed before. I feel sure that you will have the greatness and the vision to recognize the value of a new idea, in spite of the fact that it will seem utterly unconventional, strange, even absurd at first. All new ideas look like this. I sincerely hope that my talk will be a success and you can make it a success by opening your hearts towards me the stranger, by showing me your interest by a friendly smile, a friendly nod, a friendly question, in short by making me feel that with you I have found that most precious of social gifts - understanding.

Mathematics and a new "Algebra of Thought."

In my Submission I have indicated that my work provides not only a Semantics which enables children and adults to recognize vague, ambiguous and fallacious meanings. It is more than that. It is the first realization of a 300 years old prophecy made by the great mathematician Leibnitz (1646 - 1716) who hoped that one day an Algebra will be evolved which people could apply to their everyday problems and worries. However, he insisted that it must be very simple so that children should be able to operate it. This was considered a mere philosopher's speculation impossible to realize. Now any worry we have with regard to numerical questions we can solve with the mathematics we learn in the primary school. I claim now that my Algebra of Thought is applicable to the worries we encounter in our thoughts when we think of problems in our relation with fellowmen - be in the family, in the community, even in politics, that is within the nation and within the family of nations, the United Nations. Surely a mathematics like this exceeds that which we are taught in the primary school. What then is the higher mathematics which we are taught in the secondary school? There we encounter thousands of problems some of which are clad in formulas like this one:

$$x + 3y^2 + 5ab^3 = (a + b)^2 \cdot \sqrt{\frac{5a - ab + xy}{x(x - y^2)^2}}$$

Now this one is comparatively simple and it should not cause much headache to any youngster of average intelligence. But does it resemble any problem which a youngster encounters in his life. Surely not. Does it resemble any problem which an adult who is not a mathematician encounters in his adult life? Surely not.

I was one of the best mathematicians in all my classes and I have always wondered why youngsters who never intend to become engineers and scientists are tortured with such hairraising formulas. Of course with me it was different. I intended to become an engineer and scientist. But when at last I did scientific research and worked as an engineer I found to my consternation that I did not need such formulas at all. All I and other researchers need are to be found in scientific and engineering tables, and I have taught even factory girls to operate such tables and even to operate logarithmic tables. All they needed was the knowledge of addition and subtraction learned in the primary school. I taught them even the use of a slide ruler and then they needed not even addition and subtraction.

Conventional mathematics teaching is attacked by competent educators

They say it is a waste of time and effort. Few, very few youngsters go to the university in order to become mathematicians, scientists and engineers. For many others, many millions of others, mathematics is a dreadful experience. Many never get the hang of it and have to be dragged through classes by private tutors. When I put the question of mathematics teaching to educators and scholars, they admitted its drawback. Their only excuse was that it helps to sharpen the mind so that we can then attack the real problems of life with more intelligence. If this is the case, then the fascinating solving of riddles and puzzles could equally sharpen the mind. There was a time when I played chess with my schoolmates way into the small hours of the night and continued in the classroom, the small chessboard well hidden to the eye of the teacher. I was then of the opinion that the teaching and playing of chess could help the young mind to become aware of problems, hidden dangers, possible solutions, etc., etc., in a much better way than mathematics teaching could ever do. Let then mathematics be taught at the university, and there not to those who want to become churchmen, lawyers, judges, etc., but only to those who go in for scientific research in the natural sciences. In the Submission p. 3 I pointed to the incredible fact that the "Art of Reasoning" is not taught in the secondary schools of the world, the discipline of Logic. And at the university Logic is not compulsory to all students though in their later life they would have to make logical conclusions and decisions all the time which might greatly affect their lives and the lives of the whole people. Instead, Logic is only compulsory to the few students who subscribe to the study of philosophy. I said there that one of the reasons might be that conventional Logic is not suitable to be operated by ordinary people, even university students, in applications to their every-day problems. In fact, conventional logic is in disrepute, because it has become a fossilized item taken over from the scholastic age when scholars thought that they could solve all problems by operating words.

A new simple Logic for the primary school and the secondary school

Nothing more and nothing less indeed is what I have worked out, the fulfilment of the prophecy of Leibnitz and testified by great men including one of the greatest living logicians Earl Russell, who scorns conventional logic. I have enlarged on the futility of mathematics teaching in the secondary school for one reason only. You have been confronted during this enquiry by a number of competent people who have urged you to incorporate this and that and more of this and more of that into the new curriculum of secondary schools. Now I come along and urge you to incorporate my work. But there is a limit of course, set by the number of daylight hours and evening hours in which a child and youngster can be put to work. I say then:

"Reduce the hours of mathematics teaching in which abstract symbols are operated with no relation to our every-day problems, and introduce my simple Algebra of Thought in which real life symbols are operated in problems directly related to our every-day life problems."

In an article which appeared recently in the Sydney Morning Herald (January 18, 1955) your life work Dr. Wyndham is described and the aims of your teaching, among others

"Teaching needs supplementing by a service to guide and adjust children in their problems..."

Then you should take wholeheartedly to my work, because as I have shown above the problems of higher mathematics have nothing whatever to do with the problems of the child, the adolescent and even the adults. Reduce the teaching of higher mathematics and introduce my mathematics which can deal with the problems of the child. As such it can be taught even in the primary school. I shall now follow up a few examples pointed out in the Submission p. 5 and shall enlarge upon them.

"Whom do you love more, Mummy or Daddy?"

This is one of the examples I have mentioned. It is a question which probably every child gets some times by "well-meaning" aunts and the like. Everytime I hear such a question I fall into a rage, because I think of the torment of emotions, the conflict of loyalties in which such a question throws every child and which I have experienced myself in my childhood, especially if my parents were present (as they often are when aunts and their ilk are testing the intelligence of the presented child). Now, every educator may have the right answer for such a problem and this is, to say: "I love Mummy and Daddy equally well!" The trouble however is that such an answer is in most cases a lie. The child has its preferences of sympathy and antipathy. Being thus forced to say a lie, it realizes the great advantages of lies. It has realized them before. When mother asked sternly: "Have

you done this?", a simple lieful "No!" solves all the problems and averts punishment. No matter how often teachers, pastors and priests are telling youngsters that to tell a lie is very bad, the youngsters know that it is often very good, for instance in a question as the one mentioned in this paragraph.

Let us now transfer this situation into the region of mathematics. Let it be this time an uncle who tests the intelligence of a child by asking "What is more, thirty or thirteen?" If the child is below the kindergarten and has not grasped the meaning of numbers the question will of necessity be incomprehensible to it. If it has just learned of the numbers it may bewildered give the right or a wrong answer. But if this question is put to a teenager who has already tackled trigonometry, he may take offence and may think, though not say: "Stop asking stupid questions, idiot!" Well, I hope during this talk to prove to you that any child who has mastered a bit of my symbolics will have realized the falsehood in the question "Whom do you love more, Daddy or Mummy?" Children who have grown into adults with the knowledge of my work will refrain asking such questions to children.

"You do not love me as much as I do!"

This statement is made by many adolescents in their first love affairs, and it is heard in many a home in all countries and in all languages. What is the correct answer to this? How is any proof possible? What to do in such a situation? Some husbands grab a club and hit their wives over the head, as Somerset Maugham recalls. The statement is maddening, especially if you feel real affection for your partner. Equally maddening are the other assertions which I have mentioned

"You are talking too much!"

"You are the most inconsiderate person" etc, etc. (see Submission p.5)

In my Submission I have said that natural disasters by flood and famine, by tremor and tornado are rare and cause little damage. The damage to our lives which we cause by using such words and such statements is unfathomable. Look around the whole world! Where is the happy couple, where the happy family in which no quarrel ever arises? They are non-existent. Instead we create miseries of our own making, miseries unheard-of, and all by the use of words only. And all that teachers have taught us is to read and write and spell and pronounce these words correctly. Then we were let free to make our lives and the lives of other people miserable. I can prove that my symbolics can help mankind out of this terrible rut. I ask you to set up a seminary of teachers where I shall prove that every verbal statement can be resolved in much the same way as a mathematical statement is resolved.

Formulation of real-life problems

On the foregoing page I have written down a hairraising yet simple mathematical formula and have said that youngsters (and adults who are not scientists) never need to solve such problems in their lives (except to pass examinations). Now let us write down a formula of a real-life problem. So far, the statements mentioned above as for instance "You are the most inconsiderate person" are only part of a real-life problem. Usually something happens before the statement is made and then we are faced to find a solution. The statement is easily resolved in Semantography, just as easily as for instance the statement $(a + b)^2$ is solved by any highschool student. But this statement is only part of a larger formula as seen on p. 3. Could we formulate real-life problems in a way which children could then tackle? I think we can and I shall indicate how this can be done with one example only.

A child loses, by its own fault, money entrusted to it.

Almost every child has to face a situation like this at one time or another. It may not be money but something else of value. The child may be an apprentice, or an office boy, or indeed a young man or woman who has to account for the loss. What to do in such circumstances? Now it is not necessary to write these circumstances down in my symbols. Leibnitz realized 300 years ago that we need not use those real-life symbols. Only the knowledge of how every word looks like in the symbols, and how the symbols are to be operated, will be sufficient for giving us "thoughts less surd and verbal than we now have." Let us then indicate a problem in "equations" written down in ordinary language. The formula on p. 3 is incomplete. It has 2 unknowns x and y , and we need two statements to resolve them. Furthermore as we find power 2 and power 3 in the formula we realize that more than one correct solution will be possible. Lastly, if we do not get a second statement then we can only determine the simplest relation of x to y and if we write this down in the form of a function $x = f(y)$ we realize that x and y are variables and that for different values of x different values of y will be obtained. Well, something similar can be encountered when solving real-life problems by Semantography.

Here now are the formulas and a number of variations which the teacher can put to his pupils:

- (1) Mother gives you a small amount of money (how small, how big?) to buy something.
- (2) She gives you either (a) coins and the correct amount or (b) in coins exceeding the amount, the change to be brought back, or (c) in a larger bank note.
- (3) She gives you the money directly in your hand, or in a purse, or into your pocket, either openly or she secures your pocket with a safety pin, etc.
- (4) You lose the money or part of it by your own fault in a variety of ways, as for instance (a) you feel an irresistible urge to spend a few pennies on an ice cream, (b) you open up your hand and toying with the coins some of them disappear through the grill of the street drain, (c) you join a boys gathering who play marbles or two-up for pennies. You risk a penny and win, then you go on and lose part or all the money, etc.

There are endless varieties to such real-life problems and the teacher should have no difficulty to formulate them in various ways, changing the variables x , y , z and more of the meanings which are to be found in the formulas and which are easily recognizable to anyone who knows of Semantography.

What is the solution to such a real-life problem?

Many a youngster will know immediately of a simple and safe solution: a plausible lie, and sure enough if he is a good actor (and most children are) he will get away with it and have his cake or ice cream too. Later on, he will use the same solution for similar real-life problems. In the office a few stamps taken away will go unnoticed and so on, and so on, until the police will catch up with him in bigger deals.

Now, applying mathematical reasoning to such problems there is something which teachers of mathematics do not tell their pupils, simply because they are told to teach mathematics and not ethics, human behaviour and the like. And this is:

"In the language of mathematics you cannot tell lies. You cannot say:
 $2 + 2 = 5$ or $a + b = 2ab$. You will be found out in no time. Worse, you will harm yourself in real-life by telling mathematical lies."

Are there a variety of possible solutions to such a problem without telling a lie? There are quite a number and the endless repeating of such solutions in the years of schooling (just as the endless repeating of mathematical problems) will surely help youngsters in real life. Some of such solutions are

- (1) Go home and make a clean confession.
- (2) Break up your piggy bank and make up for the loss.
- (3) Present mother with your piggy bank, ^{or} make up for the loss secretly.
- (4) If you have no piggy bank go to your uncle or a friend, make a confession and borrow the money. Forgo then all icecreams and pay the money back, etc. etc.

One possible solution: suicide

As a young boy I found myself in such a predicament, and wandering desperately through the streets/^{was} too ashamed to tell my parents that I have been lured into gambling (for heavens sake) away the money entrusted to me. Then I thought of suicide. Now the mental mechanism which leads to suicide is that of a sudden decision, and if the opportunities for carrying out that decision are readily at hand, as for instance a bridge over a river, the unhappy person will jump. Fortunately for me, the river in our home town was three miles away and it was a long and tiresome walk. I had time to think it over.

Since then, every small notice in a paper which reports the suicide of a youngster because of a minor lapse, or a bad report card makes me remember the agonies I went through and makes me feel that the school does nothing whatever to teach children how to find solutions to such problems. Instead we are forced to remember (at least up to the examination) the name of the largest mountain in Bolivia or the largest river in Mesopotamia, or the dates of the marriages or murders of kings and conquerors, and the like, all surely directly related to the problems of the child.

Summary of the foregoing paragraphs

Problems like the one above, which are to be expressed in a number of formulas with a number of unknowns are already "higher real-life algebra". Now I shall explain the solution of simple statements with the aid of my symbols, before going further.

The first important symbol elements of Semantography

The first 16 symbols are known to every youngster. They are the 10 numbers and the symbols for their operations, the last one being the relation symbol as in: $a > b$, meaning a in relation to be is greater than b.

1	2	3	4	5	6	7	8	9	0
one	two	three	four	five	six	seven	eight	nine	zero
+	-	X	÷	=					>
addition	subtraction	mutiplication	division	equality					relation

Now to real-life symbols

The 16 mathematical symbols shown above are abstract symbols. They are operated in an abstract void not directly related to real life. If applied to real life, they may tell lies. $2 + 2 = 4$ and $2a + 2a = 4a$ are abstract statements, perfectly true in the abstract sense. Applied to real life, say to apples, we may indeed find that 2 apples + 2 apples = 4 apples. Sure enough, the text books on mathematics are full with such real-life problems. But what the teacher of mathematics does not tell is, that sometimes of the 2 apples added to the first 2 apples, the second pair of apples may amount in size and weight and content to 1 apple only. Worse even, the second pair may look alright and the mathematical equation may go off perfectly at the market. Only at home do we discover that we bought actually 2 apples only, the other two being rotten. Well, we have to learn this the hard way. It means little harm with apples. But we may lose all our possessions because of our ignorance in other mathematical transactions when we find that shares and shares, insurances and insurances often do not add up at all, though in the school text books they do.

In other words we must introduce real life, happenings in this real world of ours, and to do so we must realize that all the happenings refer to material THINGS performing physical ACTIONS, or in a more scientific way: we observe in Nature two aspects, phenomena of MATTER and ENERGY. We must introduce these 2 aspects with the following new symbols



material THING, Matter



physical ACTION, Energy

These two symbols have a deep significance, one which should appeal to any youngster, and indeed, as private tests of educators have proved, children are "thrilled" and "fascinated" by my symbols. according to the reports which have reached me. I am a chemist by profession, preference and even passion, a passion which has gripped me in my early boyhood when I beheld the enrapturing beauty of a crystal. How difficult it was for me to paste together a cardboard cube. But here in the apparent chaos of volcanic lava, the most beautiful, most symmetrical cubes appear, just by themselves. If this proves anything, it proves that matter is not built up chaotically. On the contrary, a divine harmony and order pervades even the inanimate material things. As Einstein puts it, sublime order emerges where we believed to be chaos only. Well, my little symbol taken from the outline of a crystal thus $\square$ shall remind every youngster that we human being have been given a mind in order to discover little by little the divine laws of order and harmony which govern our Universe, and which are only obstructed by some momentary disorder of too many things happening at once.

The second symbol indicating ENERGY Δ has also a deep significance. During my travels through Italy I stood on top of the inner craters of Mount Vesuvius and Mount Etna and watched in terrifying awe the spectacle under me, the roaring fumes enveloping me which I knew so well from the chemical laboratory, the red glow of the subterranean furnace, the deep growl and thunder which accompanied all. Here I said to me, here we have one of the first and primeval ACTIONS on earth, the throwing up of volcano cones, the thrusting up of mountains. This experience I incorporated in my symbol Δ for physical ACTION, Energy.

Now we can make thousands of exercises for children in the primary school to find out THING words like crystal ($\square$), stone ($\square$), house ($\square$), man ($\square$) and ACTION words like ^{to}crystallize (Δ), ^{to}fall (Δ), ^{to}build (Δ), ^{to}go (Δ), etc.etc.

Let us form symbol compounds

In doing so we follow the same procedure which we apply in mathematics and chemistry. We combine element symbols and arrive at different meanings. We shall now combine the 16 mathematical symbols with my new two symbols for Matter and Energy in such a way that these 2 symbols are put on top of other symbols as "indicators."

$\overset{\wedge}{2}$	$\overset{\square}{2}$	$\overset{\wedge}{+}$	$\overset{\square}{+}$	$\overset{\wedge}{\times}$	$\overset{\square}{\times}$
to pair, to double, etc.	pair, double, duo, duet, etc.	to add, ACTION	the addition added THING,	to multiply ACTION	the multitude of THINGS

Now, in mathematics, the same symbols placed in different positions take on different meanings as in 123 and 321. Then we may have different sizes of the same symbol to mean different combinations as in 22 or 2^2 which is usually written in different size. Similarly we may use different size and different positions to mean this: 2^2

$+$	$+$	$++$	$\times$	$\times$	$\times\times$
addition Action	and, also, too, etc.	furthermore, moreover, etc.	multiplication Action	much, many,	very much very many

The symbols for the mathematical operations are Action symbols anyway, indicating some operations, Actions. We therefore do not need the Action indicator on top.

The danger in the mathematical symbol for equality =

Mathematical equality is an abstract fiction. It does not exist in our real world. We find certain similarities between members of certain groups having some sort of an equality, but only to a certain extent. So, human beings are equal in so far, that they have 2 ears, 2 eyes, 2 hands, 2 legs, etc. but among themselves they differ. Even identical twins differ slightly. We can observe differences in any THING. Not two human beings are alike, not two birds are alike, not two fish are alike (though they may belong to the same species), not two flowers are alike, not 2 apples are alike (see before) not 2 blades of grass are alike. "Differentiation is universal" said Julian Huxley and this refers also to all inanimate matter as far as we can ascertain. Not two stones, not two bricks and not two crystals are alike.

Subconsciously we use our training in mathematics to apply the equality symbol to matters very much apart. We draw analogies, similes and make comparisons which may have beneficial aspects. Very often the contrary is true. Men's minds are led astray and men commit crimes of terrifying proportions. Aneurin Bevan referred to members of the Conservative Party as "vermin" or even "less than vermin". Hitler did some similar comparison, and being a dictator he ordered the erection of extermination chambers.

The symbols for the human being and the human mind

		
male human being	female human being	mind (outline of skull)

At first glance, these symbols look like child-like drawings of a man on his legs and a woman in her skirt. But they are more than that. They are scientific symbols to all extent and purposes, symbolizing that biological entity on our planet which has one unique and distinct advantage over all other creatures: it can be taught to read and write. No chimpanzee and no parrot can be taught this. Consequently these biological symbols must be operated in our Algebra of Thought according to biological principles. The first principle we have already outlined before: Not two human beings are alike. This we can write down in an important operational formula:

$=$	$/$	$\neq$	$\wedge_1$	$\neq$	$\wedge_2$
equal	to cross out obliterate,	unequal different	Man ₁	differs from	Man ₂

Words and the Universe

We realize that our superiority above the animals and other creatures is due to the fact that our mind is far advanced than theirs, though most of them have a brain under their skull too. They have also a language of their own, but it is doubtful whether they can formulate abstract meanings as we can. Having now articulate language human beings of all languages have formed words which refer to the phenomena of our world around us. So far, these words have been classified according to grammatical laws which are ever violated by people and which are therefore in constant change. The grammarian has no other recourse than to accept many expressions (considered as "incorrect" by him) as "correct" after a period of time.

But what remains unchanged of grammatical laws are the physical laws of the Universe, and we have therefore classified a great number of words according to the matter ($\square$) or energy ($\wedge$) aspect, whether they refer to a material THING or a physical ACTION. Now we can make a wider survey and divide all words of all languages into two groups, namely:

Words which refer to some material THING ($\square$) and its ACTION ($\wedge$) as stone ($\square$) falls ($\wedge$). For all these meanings there exists a real counterpart outside of our brains.

Words which have no real counterpart in the physical world outside of our brain. Such words are for instance emotion, love, consideration, inconsiderate, etc., etc. All such meanings refer to some happenings inside of our brain.

We can photograph and film THINGS and their ACTIONS, because they exist outside of our brains. But we cannot photograph consideration, conscience, etc. These refer to our mind. Now, not two human beings are alike and consequently not two human beings act and think alike. In short

$$\frown_1 \neq \frown_2$$

mind₁ differs from mind₂

How much money and how much love?

Children, adolescent and adults indulge in the gentle art of bragging. "My father has much money, many suits and hats and pair of shoes," says one youngster. "But my father has more money and more suits and hats and pair of shoes." Children in the primary school know how to solve such questions: "Well, how much, how many? Let's count!" If the bragging goes about marbles, or pencils or other THINGS which are open to counting, all arguments will soon cease. But what is the answer to the questions "Whom do you love more Mummy or Daddy?"

"You do not love me as much as I do!"

Both statements contain the meaning of much and more which we symbolize with the symbol shown on p. 8 (the symbol in a higher position means then more). It is simple to realize that much and more and most and least are undefined meanings. Thanks to the sciences, we are now able to weigh and measure material THINGS ($\square$) and their ACTIONS ($\wedge$) as for instance money ($\square$), suits ($\square$), marbles ($\square$) or falling ($\wedge$) slow and fast and other meanings referring to Actions.

But so far, no encephalograph has been invented to measure happenings inside of a human brain, happenings for which we have many names such as love ($\circ$), emotion ($\circ$), consideration ($\circ$), hate ($\circ$), jealousy ($\circ$), indifference ($\circ$) and thousands of similar "mind meanings". But even if such an apparatus were available, it would not register properly because of another simple biological phenomenon:

Our body, our brain, our mind is changing constantly

This biological phenomenon is obvious to every adolescent who sees himself growing up and changing his mind about this and that. Indeed, we may change our mind overnight. We may go to bed in despair and wake up in hope though nothing has changed in our material situation during the night. We may love today and love more to-morrow and our love may change into hate and into love again. In order to write our second operational mind formula we must introduce the time element

$$\begin{array}{ccccccc}) & &)(& & (& & \frown_1 \neq \frown_1(\\ \text{past} & & \text{present} & & \text{future} & & \text{the same mind may differ in time,} \\ & & \text{(see next page)} & & & & \text{may think differently tomorrow than today} \end{array}$$

Time is unpicturable. We use the outline of two parabolic mirrors)(. This one) faces the past written words. This one (focuses the path of the future words. Placed on top of other symbols we thus form past and future tense.

How to operate all words containing the mind symbol.

About the form, weight, place of material THINGS (□) different mind must come to an agreement, because these real THINGS exist in the world outside of human brains. This refers also to physical ACTIONS (Λ) performed by material THINGS (□). But mind meanings like doubt (○), certainty (○), convincing (○) and unconvincing (○), what is art (○) and what is not art (○), etc. etc. do differ in different minds and two minds may or may never come to an agreement. If one person is convinced (○) and the other remains unconvinced (○) there is nothing they can do about it but to respect each others opinion as being a relative truth, relative to each system of reference. However there is hope, because the other person may think (○) it over and may change his or her mind (○). Those simple biological operational formulas: two minds may differ $\circ_1 \neq \circ_2$ and a mind may change $\circ_1 \neq \circ_2$ must therefore help mankind in many endless debates which lead nowhere because no proof is possible. But other and more destructive debates must cease too, out of the knowledge that we have no means to measure and weigh mind meanings in another mind. We do not know what goes on in another mind and therefore debates like these will and must cease:

"You do not love me!" "It isn't true! I love you!"

"You are jealous!" "It isn't true! I am not!"

"You are inconsiderate, cruel, selfish!" "I am not, I am not, I am not!"

As I said in the Submission, marriages break up, families break up, lives break up.

The positive and negative mind attitude

A baby will squeak when favourable impressions pervade its mind. It will cry when unfavourable and negative impressions are received. These squeaks and cries, clad later in articulate language, accompany us from the cradle to the grave



positive, favourable, sympathetic
mind attitude



negative, unfavourable, unsympathetic
mind attitude



tolerance

Two men may listen to a speaker and the one will insist that he is an orator ♀ whereas the other man will call him a chatterer ♂. The very same writer may be called a poet ♀ and a scribbler ♂ by two different minds, who however (thank Heavens) may change their mind to-morrow. The people who inhabit the continent called Asia are angry when they are called Asiatics, because they think that the word Asiatics carry the negative meaning element of backwarness ♀, inferiority ♂, stupidity ♂, etc. Therefore they insist to be called Asians ♀. We would equally get cross if we were addressed as Australiatics ♂ or Australasiatics ♂ or Australasians ♂, etc. We are Australians ♀ and we demand a positive, favourable and sympathetic attitude. Take the Thesaurus and you will find that thousands upon thousands of synonyms carry the ♀ or ♂ meaning element. We say a word and often cannot understand why another person is deeply offended by it and insists on another synonym.

It took me years to find this simple relationship, and when I then formulated my symbol for tolerance, a mind attitude where you let all your unfavourable impressions be balanced by favourable ones, I was thunderstruck. We engineers have used this word and symbol $\pm$ for tolerance for decades. Knowing very well that every human is never perfect, when we order say steelshaft of exactly 1 inch diameter, we know that we must be tolerant, and we define our tolerance in mathematical figures thus ± 0.01 inch. I maintain and I am ready to prove that this and other symbols can help mankind to be tolerant towards each other and to have understanding of each other.

Professor Carleton Washburn, grand old man of Education.

When he visited Australia in 1949 he had only a few minutes to spare for me, but he realized, as you may have realized, that here is an entirely new idea in Education. A few days before, he said over the Australian network as "Guest of Honour" in accusation of the whole educational profession of the whole world: "We Educators take easily to technical innovations, but we resist any change we even pride ourselves with the antiquity of our educational innovations!" Impressed by my work he demanded that it "should be subject to controlled experimentation." What I want from you is to implement Professor Washburne's recommendation so that you may in the words of Bertrand Russell thus "perform an important service to Mankind."

The End