

On Mistakes



Educational Solutions Worldwide Inc.

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Our Newsletters have been the channel through which we presented either our contributions in meeting, our preoccupations with, or our analyses of some educational challenges. This issue may cut across some of these trends.

Since a newsletter is not a treatise, we can only touch upon the items we present and only hope that we have stimulated thinking in a number of directions which we have found important in the field we consider. Mistakes, of course, have always existed and we do not have to tell our readers those things which they already know as well as we do. There may be a place for what we are offering here if we manage to write about what we find important in the areas that engage us, knowing that the singularity of our experience makes it unlikely that most people have already met and comprehended what we choose to put down. It is easy to be original in a field where there is much more to do than has been done till now, and we feel mistakes is such a field. This field is a meeting ground of a number of sciences with labels such as: learning, theory, epistemology, sociology, psychology, linguistics, pedagogy, etc. We therefore expect that our readers will be interested in the content of the articles we are publishing here and possibly be stimulated to add their findings to what we ourselves have added in a very worthwhile domain of study.

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Errors And Mistakes

In a number of activities of ours, we only do what we know and therefore are always right when engaged in them. But every time we are confronted with what we either do not know or are only just beginning to know, we neither expect to be right nor fear meeting the unknown and therefore be wrong.

Since life always involves us in doing something in contact with the unknown, it would be normal to be at peace with being wrong and in noting this fact, to be helped to change course and be readier in adjusting to the new that is coming our way.

We shall call errors the inevitable aspects which are all indicators that we are facing the unknown. Errors only tell that whoever commits them is still not on top of the challenges. They go hand in hand with activities. Their inevitability makes them functional and therefore significant.

We shall call mistakes (mis-takes) another kind of activity of ours in which we deliberately take something for what it is not, i.e., mis-take this for that.

Errors underline the matter with which we are linked; mistakes underline the person who is involved in the activities. But because we easily yield to opinion, the boundary between errors and mistakes gets more and more blurred and we mis-take one for the other. The two words become synonyms. When we resist the opinions of others

(parents and teachers, for example), we can distinguish errors from mistakes and say, for instance, “it is a mistake to let errors be confused with mis-takes,” and know what we are saying.

Indeed, errors happen, while mistakes are made. If I do not know that a container is hot and I place my hand on its hot surface and burn myself, the error is what happens and the mistake is that I do not allow a possibility of whose existence I know, to guide my actions; and that is the mistake.

If I write $2+3=6$, I make an error which results from my mis-taking “+” for “x.” The result (an error) is correct within the mistake, which would not be the case if I had written $2+3 = 17$, showing that I only know that the answer should be a set of figures.

Whenever we collect errors made by our students in their arithmetic tests or homework, we can find some lead to what they are mis-taking for what, and guide our teaching to generate the criteria in our students so that they stop making mistakes, which then becomes apparent by the absence of errors. If someone says, “I did went. . . .,” there is only an error, because the convention which requires “go” after “did” to express the past has not yet been assimilated. But if someone says, “I do went. . . .” there is a mistake because of a tension between the present and the past. Such an “error” is not made by foreign students of English, even though they still do not know how to use verbs in that language. They may never quite distinguish, “I did go. . . .” from “I have gone. . . .,” because one needs to refer to some other criterion for the choice between these two sets of words; yet they may still know that, “i do went. . . .” is not to be said. The error committed when using the inappropriate one results from the mistake of ignoring such criterion assuming it has been presented to the foreigner.

Watching a baseball game, we notice that errors are counted as well as hits. And they are called errors although they come from players’ letting a ball fall after it had been caught. They would therefore be more correctly described as mistakes since it could have been avoided, as all players know, and they are not meeting the unknown in this case.

When we practice a skill such as making objects ricochet from a surface of water, we know that we make mistakes at our end that show up as errors in what the stones do on the water; and we try to correct our mistakes and show it in the absence of errors in our performance.

It seems useful to have the distinction above to separate errors from mistakes since both tell of the state of our learning: one for the public and one for ourselves. If we say, "You are making mistakes," or "You are mistaken in this or that," you may not yet know that we shifted from our view of your performance to your inner workings and place there the cause of the errors. Only there could we catch it and reduce the occurrence of errors that everyone can see.

Humans can make mistakes because they own awareness and because they meet the unknown as a matter of course in their daily life. Since they want to take initiative, they take risks and show it in their errors. We classify these as errors of judgment or errors of perception or errors of action. We rarely mistake a feeling for another in our own case, because we are close to our selves; but we may so easily mistake what we consider to be the feelings of others. We then only speak of mistakes, not errors.

On the whole, humans do not mind making mistakes and they use their errors to good avail all through their learning. They can do likewise in their teaching, as some of the subsequent articles suggest.

But this is no longer the case when there is ego involvement. In such cases, we make mistake upon mistake and accumulate errors as a result; but we refuse to work on their source, which is what prevents us from learning. Until we discover that ego involvement exists, that it interferes in a number of our activities, and that those interferences cause errors of a kind we cannot stop by being more skillful, we are unable to eliminate our propensity to make mistakes. In some of our articles this matter is taken further. Here we only want to stress that in our complexity we may find that mistakes and errors are not only intellectual or physical, and that perhaps the most challenging ones to each of us are in the realm of affectivity and the dynamic of being.

On Mistakes

The use of mistakes and errors in our teaching comes from the awareness that errors are symptoms of some inadequacy to the task which can span from a momentary slip that can spontaneously be put right at once to a total unconsciousness of a state of being which can only generate mishaps and misdeeds. Between these two extremes we find the many kinds of mistakes and errors which will serve as indicators for the establishment of criteria that accompany mastery in the various skills of which there are so many.

But since life is not only skills and their acquisition, errors and mistakes have to be considered in the domains of relating, of artistic expression, of involvement in politics, commerce, research, etc.

This we shall leave on the whole out of this newsletter, although it may be as important or even more important.

Caleb Gattegno

Chapter 1

I have recently begun a search for the ways that mistakes are viewed by researchers in the field of reading. Only in the psycholinguistic literature of the 1960's and 70's, did I notice that writers began to look deliberately at mistakes, so I concentrated my reading in this area.

Several trends emerged as I examined the work of these psycholinguistic researchers. First, the authors did not consider mistakes to be "bad." Their reasoning was that, after all, children make mistakes when they are learning to speak and are not usually punished or pressured to correct themselves. Goodman, in fact, felt so strongly that mistakes need to lose their negative connotation that he preferred to call them "miscues" rather than mistakes. Second, it appeared that some psycholinguistic researchers recognize that mistakes offer valuable diagnostic information. Elaborate schemes have been devised for classifying the errors of readers: for example, The Goodman Taxonomy of Reading Miscues requires that 28 judgments be made for each error that a person makes while reading.

Although these views seemed reasonable, as I read further it was clear that the psycholinguistic researchers' work on mistakes was primarily concerned with gathering evidence to support their theory of the nature of the reading process. They were not primarily concerned with understanding more about mistakes, such as the role of mistakes in learning, or the sorts of functionings that produce mistakes.

I had started my search by looking for literature on “mistakes.” There was no reference to this word in the sources I consulted. Instead, I could only find references to “errors.” The stress in the literature on errors seemed clearly to be on reading performance. The instruments used to analyze the errors offer a profile of an individual’s reading, but they do not reveal much about the learner or the learning. I concluded that these researchers used the word, error, because they are concerned with a task; I use the word mistake because I am primarily concerned with the learning of a task. For me, the word, mistake, puts the stress on how a person is working; that is, how that person is using him/herself to cope with the challenges that a particular task represents. Is the learner mobilizing the abilities that the task calls for?

A third trend I observe in the psycholinguistic literature is that the consideration of mistakes is restricted to diagnostic situations. Theoretically the use of the existing diagnostic instruments such as the Goodman Taxonomy of Reading Miscuesis designed as a basis for setting up a program related to the learners’ strengths and weaknesses. But this view perpetuates the idea that testing (even diagnostic testing) must necessarily be separated from instruction. It seems that these researchers do not discuss that, if teachers receive and respond to mistakes of the learners at every moment of their interaction, then testing, teaching, and learning can be integrated in instruction.

Indeed, the psycholinguists are vague when they suggest how teachers might respond to mistakes. One researcher recommends, for example, that teachers could be most helpful by being available in the environment to supply information when students need it. Another suggests that there are reasons to wait before correcting mistakes, to see if the readers will correct themselves. Their descriptions make me conclude that these psycholinguists may not have considered that this response on the part of the teachers only proves that they understand what to do and does not guarantee that the students have learned what is required.

The psycholinguists may provide us with tools which help us classify reading errors. But in order to understand how mistakes can put me in contact with learning and with human functioning, I need to go beyond a

description of behaviors. I began to examine more deliberately my own views on the role of mistakes in learning to read. I asked: “When I am teaching, what characterizes my response to the mistakes of learners?” I thought of students I have worked with in our reading clinic and of how their mistakes helped me to become better acquainted with them as persons, learners, and readers. A few points are clearer after this examination.

1 I notice that in my work with remedial readers I do not receive mistakes as an indicator of reading disability. Instead, the mistakes inform me about a person whose beliefs or bad habits may be keeping him or her from reading easily or fluently. I thought particularly of a secretary, “P,” in her 20’s who came to our reading clinic recently. She could read many words but had few strategies for word attack. She felt disheartened, helpless, and lost when she encountered a word she did not know. As she read I learned that this student had one major obstacle in her efforts to improve her reading: a deep-rooted habit of saying the names of the letters when she looked at unknown words. So the word sent would be “read” es, ee, en, tee.

If I had only stressed “P’s” errors and not considered what was producing them, I may have concluded that she needed assistance only on difficult words with “bizarre” spellings. I may have been swayed by the fact that she knew so many words and therefore attempted to maximize the role that context plays in reading unfamiliar words. In seeing how she attacked unfamiliar words, however, I understood that “P’s” difficulties resulted from her belief that word attack was related to naming the letters in unknown words. She was unaware that spoken words were made of sounds ordered in time and that written words consisted of sounds represented by signs which were ordered in space to correspond to the order in which they were ordered in speech.

Because of this understanding, I began my work by providing exercises which mobilized her listening. For instance, I asked her to listen to words like pass or sick; to determine how many sounds were in the words; to reverse the order of the sounds; and to tell which words resulted. Through these exercises, “P” became aware of the universe of sounds and how their combination and permutations resulted in words.

When I referred her to the phonic code in order to make perceptible the correspondence between the sounds of English and their complex orthography, she could transfer her awareness to printed words. “P” had the evidence that the proper use of her abilities led to progress. She reported that not only was she now able to teach herself to read, but that she considered herself a different person. “I even pronounce the words differently. Now that I know that sounds are there, I just want to say them,” she observed.

In “P’s” case, I see that I did not respond to her errors. Instead, I responded to the source of her errors, i.e., the preconception that saying the names of letters would make it possible to read unfamiliar words.

2 Mistakes are far more than indicators of performance; they are also a source of information about the person who is performing. Do the learners take risks? Mobilize their attention so that they are present in their actions? Have deficiencies in the use of their capacity to hold information? Experience difficulties due to the upheaval of emotions?

Using mistakes as an opportunity to know the person who is learning seems especially crucial when working with students who have encountered difficulties in reading. It often happens, for example, that obstacles in learning to read occur because of affective factors.

A few months ago, a college student came to our reading clinic for a diagnostic session. The clinician took a book from the table and opened it to a page that contained a letter from a young girl to her father. The girl was expressing thoughts on her upcoming birthday party.

The student read the first paragraph of the story fluently and with ease. In the second paragraph, she began to misread words and to distort the melody of the reading. Her voice began to tremble. The teacher in this case did not interrupt the reading when the student began to experience difficulty. After the student finished reading, the teacher asked: “Do birthday parties have some special significance for you?”

The student began to cry and confirmed that this intuition was correct. In this case, it seems that the errors were the misreadings of the text. But the student's errors were only incidentally reading errors. Rather, they resulted from her allowing words on a page to produce an upheaval of her emotions. And then, because she was with her inner state, she was not sufficiently present in the act of reading.

In order to have a correct diagnosis of this student's reading, the clinician had to give little attention to the observable errors and be sensitive instead to the emotional state of the learner. Were we to work with her, we would have to help this student to hold in check her emotional state so that it does not interfere with her receiving the messages of printed pages.

C. In my literature search for the role that mistakes play in learning, the phenomena researchers studied were always observable behaviors. This bias seems limited, precisely because in interpreting these mistakes, the appearances can be mistaken for realities.

When I examine what I do in order to let the mistakes of learners guide my teaching, I find that I attempt to make myself sensitive to the source of behaviors, which is the inner life of students. I am reminded of another student who came to our reading clinic.

This fourth grader was referred to us because his teacher found that he could not remember what was being taught from one day to the next. Indeed, this student did appear to have a weak memory. On one occasion, for example, he read correctly: Tim and Tom sat on the sand. Then when he was asked to read it again a minute later, he said: Tom and Tim . . . Tom and Tim. . . One interpretation of the appearances may be that this student had forgotten how to read the words Tim and Tom. It may even be tempting to conclude from this evidence that his memory was weak.

The psycholinguists would most likely conclude that this was a "good" error. They would explain that the student was using his knowledge of the spoken language in which "Tom and Tim" is an equivalent expression for "Tim and Tom." Most likely they would use this evidence

as an indication that the student was “reading for meaning” and conclude that this mistake should not be brought to the reader’s attention. But will this restricted view of reading as an interaction between the reader’s language and the author’s language allow access to other psychological and affective components of the reading process? It may allow us to know something about “E’s” errors, but it does not illumine much about “E’s” functioning as a learner.

My interpretation of this mistake included the knowledge that the linguist in this student was at work in substituting “Tom and Tim” for “Tim and Tom.” Well and good! But this intelligent, capable boy had not learned to read in four years and I needed additional understandings of why this was the case.

From the ways that “E” attempted to get me to tell him the answers, I concluded that he had “been told” the correct response whenever he was in difficulty. He had become dependent on what others told him, and was a master at obtaining that the teacher supply the information rather than accept to take initiative. It was his “good” memory, in fact, that had encouraged him to “read” from memory instead of from the text. In the mistake of “Tom and Tim” I understood that the student was “remembering” words previously read instead of “looking” at them. To help him, I needed among other things to have him work on looking — not on remembering.

These examples are just a few which have offered me a beginning understanding of mistakes. I have learned how to let the mistakes of the learners work to my advantage as a teacher. I have curbed my tendency to tell and even my urgency to have the students correct themselves at any cost. When I first began to teach, the mistakes of my students were received primarily as an indication that I had not done my job adequately. I had little recourse but to hope that somehow the mistakes would miraculously disappear the next day.

I was able to shift my stress in receiving mistakes from “my failure” as a teacher to what the mistakes were telling me about the state of learning in the students. When I could learn from them what they had to teach, the mistakes made my next efforts more precise, enlightened,

appropriate, and therefore effective. Access to the subtleties and sources of mistakes is a universe which mobilizes all of my sensitivities.

Katherine Mitchell

Chapter 2

One does not need to go far in order to look for how variedly we relate to what we commonly call our mistakes. Looking at oneself and observing people around can provide one with sufficient data.

As soon as a mistake occurs we are likely to hear: “I did not mean it,” or “I am not myself today.” This is one sure way of disowning our mistakes. The fact that we are not quite aware of our responsibility for our own actions comes through in another way when we try to blame an outside agency for them.

“It’s only because . . .” is a common expression. Some desperate attempts to hold others responsible for what we do, find expression in: “But you generated this in me,” or “She asked for it.”

Also, we are good at explaining away what we think are our mistakes. No sooner does a situation confront us with the so-called mistakes, then we get distracted by having to give justifications like: “Only when I am too tired I do something like this,” or “it’s the first time this has ever happened.”

Another evasive way of relating to our mistakes is to deny them outright. We vehemently defend ourselves against their mere mention, as if mistakes were some kind of evil to be guarded against. We refuse to face them for what they are. We believe if we would ignore them or

avoid working on them, they would somehow become non-existent. We shove our mistakes “under the rug” and pretend to feel “all is well.”

Also we are accustomed to feeling “so sorry” for our mistakes that most of our energy gets consumed in being sorry, and we remain prone to repeating the same mistakes. Or, again, we may be so preoccupied with accusing ourselves for not being “perfect,” and so upset and tense about it, that we are left with no energy to learn anything from our mistakes.

But whenever we are seriously engaged in the activity of learning, we do find that we have an unbiased attitude to our mistakes, the one that allows us to know a mistake for what it is — namely, an expression of ourselves. In this openness to mistakes they are understood (by those who pay attention to them) as statements of ourselves indicative of where we stand in relation to that which we are learning to meet and know. With this attitude to them, mistakes become the occurrences which can be reflected upon. They become the stuff to work on, and are known to create opportunities for us to consciously dissolve and structure anew the energy at our disposal which is volitionally on the move to relate to the totality of that which we encounter as unknown to us.

There may be various personal reasons which lead us to neglect or avoid facing our mistakes. Because one wants to remain oblivious of them, dislikes to be reminded of their existence, wants to disown or dismiss them, one is not likely to learn much from the mistakes one makes. At the root of relating to mistakes in these ways there could be found mechanisms of pride, fear, anxiety, ego-adherence, ego-centricity, etc. Such dysfunctionings of one may cause confusion and put one out of ease with mistakes, one’s own as well as those of others.

Schools could be the place where people learn to function on a level different from the one available through these mechanisms. In schools the attitude of the teachers to the mistakes of their students could help them to learn to be at peace with their mistakes and know them as the interim stages on the way to mastery.

Unfortunately, the opposite takes place in schools. In the course of their schooling, students are conditioned to consider a mistake as an undesirable occurrence. They are often punished for making what are considered mistakes by others. They are made to feel ashamed of themselves on account of them. They feel pressured to avoid mistakes at all cost. By succumbing to these pressures students miss the numerous opportunities to work consciously on their mistakes, and thus alter and transform them into adequate and appropriate forms of expressions of themselves with regard to what they are engaged in learning. Going through school does not, on the whole, help people to learn to be aware of themselves as capable of learning from their mistakes by being in charge of bringing about changes in their own functioning as learners. This seems to be so because our attitude to the mistakes of others is as prejudiced as the one we have toward our own mistakes, and our understanding of them as confused.

Because of our confusion we may be uncomfortable with mistakes; yet on the basis of our numerous learning experiences we know that mistakes have the potential of actually enhancing our learning capability provided they are understood for what they are. How can this become a part of one's awareness and how does one make it manifest in one's actual teaching? We will consider this question while we try to make a distinction between errors and mistakes, and state what we call errors and what we mean by mistakes as they occur in the process of learning.

Any time one enters a new area, one's attempts to relate to its various aspects through one's acts of learning contain errors as well as mistakes. Errors and mistakes alike are characteristic of one's responses to the field outside of oneself. Through these responses one attempts to relate to that which is new and not known to one. Through them one tries to integrate it, get acquainted with it. Since the field is new to one, one can be struck by its novelty, its foreignness. This can become the dominating force mobilizing one to act towards knowing it. Whereas this kind of activity can be exciting, it also can generate a feeling of "being lost" in one's attempts to relate. Because the focus of one's attention is on the "foreignness" of the field out there, the feeling of acquaintance with it fails to emerge. But, at the same time in one's

inner reality there is another dynamics at work. This has to do with one's energy being mobilized in many new ways to get acquainted with the reality outside one. In the process of learning one pays attention to these inner energy movements towards acquaintance. An important distinction between errors and mistakes seems to be a matter of where one's focus of attention is. If one is mainly preoccupied with the novelty of the field outside, one's learning consists mainly of trials and errors. If, on the other hand, the focus of one's attention is on one's own energy movements oriented towards acquaintance, learning contains mistakes from which one can learn further. The shift of one's attention, from being predominantly on an interest in that which is outside, to essentially on the inner energy, frees one's learning process from errors. This shift is crucial, because in human learning it is this that transforms errors into mistakes. Errors are random and are about that which is beyond one's control. Mistakes are definite; they originate from within, have to do with one's own energy movements, and thus are accessible to one's will. One can work on them in precise ways which make a difference.

We have seen how the focus of one's attention either on the inner energy movements or on the outside entity distinguishes mistakes from errors. There also exists an inner or an outer measure which determines the difference between the two. In the case of learning through trial and error, to be able to acknowledge one's trial to be an error, one has to rely on the effects of the consequences of the trial. If the consequences of one's attempts do not produce adverse effects, or if for some reason the effects are not recognized as the non-desired ones, one may never know oneself as having erred. Reliance is on some kind of outside agency for the errors to be known as errors. Mistakes, one's own or another's, are perceived as mistakes not on the basis of their consequences, but because of a sense (however faint) of the inner criteria one has, which lets one feel that one could do better. It is an assessment of one's actions with regard to the inner criteria, and not any arbitrary judgment, that makes one aware of one's mistakes and mobilizes the energy to improve upon them.

With an understanding of these two attributes of mistakes, it becomes the responsibility of a teacher to help students transform the possibility

of errors into the one of mistakes by bringing into and keeping in the focus of their attention their own energy movements. Furthermore, the teacher needs to deliberately present the new field in such a way that students have a chance to be faced with its totality, and can feel from the start their acquaintance with it at work in them. With this taking place, the students quickly leave errors behind and work on their own functioning through their awareness of their mistakes. Their intimacy with their inner activity and a growing acquaintance with the field outside help them learn from the mistakes they make while learning.

Also, so that mistakes can be recognized for what they are, it becomes necessary that the students develop inner criteria for their learning. In the absence of criteria one remains oblivious to mistakes and therefore perpetuates them or else knows them as errors and depends on an outside authority to reprimand or correct. A teacher who has understood how vital mistakes are to learning helps his students to develop criteria and to become autonomous in their learning through his teaching. He keeps himself out of their way and makes sure that the students feel competent to function on their own. When learning is autonomous, mistakes are not only permissible but are known as an integral part of the learning process. In this kind of learning-teaching situation, while students learn to function better in what they are learning, the teacher keeps on learning how to provide adequate guidance to each student to deal with the mistakes which occur. The mistakes of the students guide the teacher, enabling him to give appropriate indications as to how to work on the mistakes while the students move towards mastery.

Being sensitive to the significance of mistakes and knowing how to give them their rightful place in the learning process is equivalent to relating to them with an unbiased attitude. For a teacher as well as a learner this is like having available a constantly lit little lamp which makes visible the direction in which to take the next step in the here and now in order to keep on moving in the “right” direction.

Shakti Gattegno

An approach to teaching languages called the Silent Way puts in the hands of teachers the materials and techniques of teaching which:

- 1 present the totality of the language being learned;
- 2 stress the elements with which the students are acquainted, and which they know how to make use of;
- 3 focus on the powers and mental functionings of the students;
- 4 help build criteria for learning;
- 5 sensitize the teachers and students alike to the importance of mistakes.

For further study refer to:

- 1 *An Approach to Teaching Foreign Languages in Schools*
The Silent Way - Caleb Gattegno
 - 2 *The Common Sense of Teaching Foreign Languages* -
Caleb Gattegno
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Chapter 3

As a newborn father of a child just three months old, I have a special opportunity to study mistakes, since, as a father, I am especially watchful of what I do in relationship with my child. Also, in this relationship for me there seems to be not too much of the usual resistance to acknowledge the mistakes. Also I am capable of accepting them matter-of-factly as part of the learning which is taking place. The more than usual readiness to be affected by my mistakes is due mainly to the aura of joy that encompasses the relationship, even when things are not going too smoothly. Thus, I can study the mistakes as they occur and afterwards, to know their source, their nature, and their effects. Such a study yields an increased awareness of the role of mistakes in my learning and, by extension, in the learning of everyone. The possibility of making the study underscores the crucial place of joy and watchfulness in all teacher-student relationships where an enhanced readiness to learn from mistakes makes all the difference.

Consider with me, for example, the apparently innocuous event where a father is feeding cereal to a two-and-a-half month old child for perhaps the second or third time, and is placing the food in the baby's mouth at a rate inconsistent with the infant's capacity (or desire) to swallow what is being deposited. The father's beliefs are that the more the baby eats, the better, and that the more quickly the cereal is put into the baby's mouth, the more the baby will eat. In addition, the father is in a hurry to have the food consumed, since he thinks it would be more fun to be doing something else (probably with the baby, such

as holding the baby and dancing around the living room). The outcome of the father's beliefs and actions may be familiar to other people who have fed infants; but for those who have not:

- 1 the baby spends a lot of time sputtering, spitting, bubbling, and otherwise ejecting the cereal back out of its mouth;
- 2 the baby at some point begins to choke, becomes startled, and cries;
- 3 the father, immediately certain he may have done irreparable damage to his child's digestive system, grabs up the baby.

This abrupt movement results in:

- 1 a baby covered with sticky, warm cereal,
- 2 a carpet with sticky, warm cereal on it, and
- 3 a father with sticky, warm cereal on him.

At the close of this vignette, we find a baby who is unwilling to eat any more at this sitting (and perhaps not fully satisfied), a father who is cleaning up a mess and feeling a bit shaken (and certainly not at all satisfied), and a good opportunity to study a particular kind of mistake.

The sources of the mistake are in the father: in his prejudices about how much a baby should eat; in his lack of sensitivity to the needs of his child; in his less than adequate respect for the dignity of his child; in his selfishness; in his misconception of what is important. This list could perhaps be extended, but it is sufficient to indicate the depth and variety of the inner movements which had come together to produce the impetus and support for the actions.

As the mistake occurs, the feeling is that it is unavoidable, so deep are its roots. In spite of a gnawing suspicion that trying to get so much food in so fast is wrong, the doubt is kept at the fringes of consciousness. It seems that an enormous amount of energy is behind and supporting the mistake, an amount far in excess of the energy available at the time

to prevent it. And so what comes to maintain and carry the mistake is a rather morbid curiosity as to whether the child will indeed manage to keep up with the rate of introduction of food. The mechanisms for carrying out the mistake appear automatic, as well as powerful, and therefore imply firmly rooted ways of being. Such well integrated inclinations can only be met with a movement for changing them which is at least equal to them in energy content. And this is the most important and interesting point.

In reliving the event and letting the implications of it permeate one's being, it is possible to learn from the mistake, in the sense that one is changed so that the inclinations which produced it are divested of their capacity to do so again. Even more profound is the recognition that other mistakes with a similar source are less likely to occur. But what is it in the virtual re-enactment of the occurrence that is able to generate the sufficient amount of energy to accomplish the change?

In the case of the mistake in question, reliving its occurrence produces the very disturbing association with scenes of force-feeding that had once been viewed on a television program. The association is effective because it is an exaggeration on the one hand, and yet on the other, finds its bridge in the truth that both the actual situation lived and the one acted out in the program yielded at least one similar result — a person made to suffer discomfort in the act of eating, which should be a satisfying, relaxed, and nourishing activity. (Here also, a direct analogy is easily drawn to situations where teachers try to force students — through drills, testing, rewards, grades approbations, etc. — to “digest” a certain predetermined amount of knowledge.) The energy which swells inside at the experience of the association — felt as revulsion, anger, empathy, etc., immediately seems to envelop the sources of the mistake, and the automatisms responsible for its emergence are dissolved. There is no effort in this; rather, the simultaneous awarenesses of the sources of the mistake and the nature of its results, once fully experienced and realized, bring about the dissolution just as naturally, easily, and necessarily as the appropriate muscles cause air to be breathed in and out of one's lungs. As is true for any learning to be gained from any mistake, it is clear that the awarenesses are reached by the learner in his own terms and only through the intervention of

his will. Without the need for any discipline (since the will has been fully and effectively mobilized), the mistake does not occur again. At the same time, the impetus for perhaps many other mistakes is greatly diminished.

Perhaps to some people, all of this may seem like a tank being used to kill a fly; but in my life as the father who made the particular mistake described, it would have been a mistake to believe that less was required. That also could have occurred. But it didn't, because the necessary vigilance was at work. A bonus of such an experience comes from the awareness that the vigilance which is at work on one's own mistakes can be used to greatly improve one's teaching if it is made to work on generating its equivalent in students. For it is only when they come to know how they use their energy in similar ways, both to perpetuate and to bring about changes in set patterns that produce their mistakes, that they can be truly independent and responsible in their learning. This way of knowing is not intellectual in nature (though it can at some point take that form); rather, it is an intimate and wholly personal contact with one's ways of being which can only come from a face to face confrontation with the real nature of one's functionings. Imagine how much increased the yield per hour of learning anything can be when teachers accept to work on generating the necessary vigilance, in their students, which will result in that contact.

Ted Swartz

Chapter 4

This is an attempt to examine one particular aspect of a person: pride. That pride can be known as a hindrance is manifested by the common saying “Pride goes before a fall.” What does pride generate in oneself that could lead to such a “fall?” I’ll attempt to study some of the dynamics in this short article.

To some extent pride is intimately linked with the notion of saving face and not losing face. One uses one’s energy and does all one can to maintain a dignified facade in front of friends, relatives, or strangers. In many instances, the “not to lose face” principle is observed for the sake of others so that the others do not lose face with one. For example, to avoid friction with others or to keep others from losing face we choose to refrain from direct confrontation. Ordinarily a subtle kindness guides us to act with others in a way that they feel comfortable in being themselves with us. However, when carried out rigidly, following the face saving principle unselectively and excessively, this practice can lose its sincerity and candidness and make one’s growth suffer for the sake of being smooth. The retardation which results from indulging in this practice makes the practice qualify as a mistake in life.

The making of this mistake has its history. With few exceptions children grow up with the impression that making mistakes while learning is not desirable. As a consequence some children may try to cover up their mistakes in order not to anger or irritate the adults

around them. When caught in mistakes children may be punished or ridiculed which makes them feel ashamed and lose face. To avoid an unpleasant scene many develop a rather deep-rooted belief that one should not be seen or observed making mistakes. Through years of this kind of experience one may become inclined to shun any challenge so that one does not have to do things at which one might make mistakes and damage the image one wants to project. In short, a hurt sense of oneself can generate pride in one, and one may not know that one is being lived by it.

There are some behavioral phenomena which may be symptoms of the mistake called pride. These are often recognizable even by those who are caught in them.

1 Nervousness: One is seldom sure and feeling peaceful. Before acquiring something one worries about “not having it;” after having acquired what one wants, one begins to worry about “losing it.” Instead of disciplining oneself to look at what one does have at that moment, one scatters one’s energy all over the place.

2 Clumsiness: This is the nervousness one shows outwardly. The more one is afraid to encounter oneself in the sense of having to hide one’s ignorance or lack of knowledge, and the more one engages in putting up a facade, the less calm one becomes. Anxiety builds up. As a result, one is entangled in the desire to show the outside world only those aspects which one thinks are necessary to maintain one’s self-image. The harder one tries, the less smooth one becomes.

3 Indifference: In fact, this is more a pseudo-indifference. Because one wants to escape going through one’s nervousness and clumsiness, one adopts an attitude of indifference and shrugs off matters in a “I do not care” or “I am not interested” manner. In fact one may only be saying “I can not do it, and I am not going to let you know that!” To remove oneself from reality by appearing indifferent means that one is convinced that less involvement is safer for the protection of one’s face.

4 Stubbornness: Many times, even when one is fully aware of the in-adequacies in one’s actions, in order to save face, one insists upon

being right, and therefore refuses to take a broader view of the situation and of the outcome of one's actions. With pride at work, one is likely to spend all one's energy in being argumentative and is left with little room for self-examination.

5 Arrogance: This is an attitude of pride in an extreme form. Showing contempt for others and the tendency of thinking of others as inferior may be again an assumed mask for inner insecurity. To keep others at a distance is to reserve for oneself a nice little world where one is comfortable playing the games one likes to play and as one likes to play them.

When we witness ourselves as being restless, unsure, aloof, rude, inconsiderate, irritable, etc., we may know that these are symptoms of pride in us. An accumulation of such patterns of behavior makes it increasingly difficult to admit and become truly aware of the original source of the problem. Imagining and anticipating the possible pain which may result from meeting the core makes one hesitant to act to put things right. But, it is possible to have some awareness of the negative effects caused by the workings of pride. To choose to remain ignorant about the source of it is mistake #1. Some of us go further and find out something about the source, but stop there. This is mistake #2. The awareness of mistakes #1 and #2 is useful if one wishes to learn from these phenomena. However, the next step seems to be such a formidable jump that many people have chosen to stop at the threshold of taking this big step. It seems that in the case of some of us the recognition of the existence of mistakes of this kind is sufficient to justify no further action. In spite of the recognition that it is a mistake not to act, why would one seem not to act? It may be because the time from mere recognition to action can be months, years, or infinite. And the process involved may be not only not a very clear cut one, but also a complex one. During this time one may be wanting to do something about this inadequacy. At times, in the presence of a difficult task, one may be momentarily tempted to use it as an opportunity to face the core of the mistake. However, often the tug-of-war between this daring attitude and the old habits becomes so uncomfortable that one tenses and lets habit take over. The mistake is once more made when one withdraws and thinks, "Next time will be THE time I do something!"

The cycle repeats itself. The desire for correcting the mistake merges and subsides, and one finds comfort in a series of rationalizations for why one cannot do something now. Time goes on and mistakes pile up. At the same time this energy-consuming inner activity to protect one's pride continues.

Can the mistakes caused by pride ever be faced and help one learn?

It seems that learning will only take place when one can muster enough energy to get out of the old rut and then be relaxed enough with what one sees and senses of oneself. To learn to liberate oneself from the old feeling, one has to be less egocentric and recognize oneself as one is. It seems practical to start with forcing oneself to face some simpler issues and experience their consequences. Then one extends the same dynamics to dealing with other areas of one's life more efficiently. For example, in learning any new skill, if one enters the situation with the belief that mistakes may be a face-losing thing, then one becomes nervous and self-conscious. The anxiety caused by being afraid to be laughed at or feel embarrassed often makes one clumsy and more mistake-prone. The stress from this situation can only be efficiently dealt with when one can relax and say, "What do I have to lose," and go ahead and do it, without anticipating what mistakes one may make, how painful it might be to be insufficient, what others may think, etc. When one can direct all available energy to the use of the task at hand and not have to share this energy with fear, or other emotional competitors, one has created more room and a much better chance for successful learning to take place. To get lost in one's ego had been proved a harmful element in moving forward.

Pride in some cases keeps one from being humble enough to accept the intimations coming from the true self and thus keeping one's actions free of pride. To remain indifferent, aloof or arrogant can only eventually cause one to fall faster, and with more pain. If one learns to fall with grace, perhaps each fall would teach one something.

Shiow-Ley Kuo

Chapter 5

The idea that we construct our reality of what is around us by making mental models and then applying them to the world which is outside us, is truly an intriguing one. I am sure that a great number of people are well acquainted with this concept and have used it extensively in their discoveries and findings. I also have been aware of the fact that scientists have used models to elaborate their theories and have come through them to a more complex understanding of the physical world, for example. What I had never realized is the fact that this capacity need not be relegated to special disciplines or fields of knowledge, but can be thought of as an attribute of our mind which we use in order to understand whatever is outside us.

If this is true, the implications are tremendous. It means that absolutes no longer have a place in our lives; that by formulating new hypotheses and creating new constructs we can establish an ongoing dialogue with what is not us; that instead of feeling trapped in our surroundings, we can feel that we create them. It means that notions handed down by tradition and habit can be understood for what they are and easily discarded if no longer serviceable. It means that creativity can become an integral part of everyday life for every human being.

I know, in my own experience, that a new understanding of the nature of mistakes has changed drastically the classroom reality for me on an everyday basis and it has allowed me to be freer and more creative.

For a very long time, I had accepted the commonly shared concept that errors were nothing but “horrors” to be avoided or treated as sins. If a person committed an error he had to pay the consequences for his action. I suppose that such a view on “errors” must have come to exist when our civilization conceived the purpose of human life as the attainment of an eternal life in heaven. The word “error” comes from the Latin “errare,” “to wander.” Originally those who first used the word must have seen in the activity of “erring” a search, a moving about without specific aim or objective insight, an activity of experimentation. But as the understanding of human life and its purpose changed, new connotations must have colored the word. How can “wandering” be acceptable in a civilization where there was only one path which led to salvation and salvation was the only meaning of life?

I am certain that many of the people who passed on to me a negative view of errors did not hold “The Salvation” model for understanding the purpose of human life. However, there was no awareness in them of how pervasive mental constructs can be in every aspect of one’s life, and how easy it is to accept unquestioningly their implications even when they are found to be no longer valid or satisfactory.

For my part, as soon as I was made aware that errors or mistakes (here I am using the two words interchangeably) were an integral part and a necessary ingredient of any learning process, I began to look at them instead of running away from them. What this study has yielded is truly extraordinary. A new universe has opened up for me and I now wonder how I could have taught for so many years without this powerful instrument, which is being in close contact with students’ mistakes. (Not to speak of being in contact with one’s own mistakes!)

There are different kinds of mistakes and each type requires on the part of the one dealing with them, a special attention and special sensitivity. The kinds of mistakes which suggest that students have not yet automatized certain verbal sequences (in learning a new language) guide me to introduce specific practice exercises before going ahead with new material. Then, there are other mistakes which make me aware of the fact that students are still confused in associating particular images with particular sets of words. Mistakes of still another kind are made by students when

they try to reach out and combine all the known elements in ways which the language being studied does not allow. This may tell me that I need to change the pace of my teaching.

The kinds of mistakes mentioned above are to some extent easy to detect and it is reasonably easy to respond to them correctly. But there are other mistakes much more mysterious and challenging. Watching a student make a mistake can be a fascinating activity: I still wonder, for example, why a student could produce almost perfectly the sounds “tr” in the word “quattro” but could not do it in the word “tre”.

After some practice I have come to recognize that mistakes are often the result of interferences of all kinds, so that the real work to be done is on the removal of the interference and not on the mistake itself. There follow a few examples of mistakes which originate in the way we interfere with our own functioning.

One student had a very hard time distinguishing the two Italian sounds for “e.” It took me a long time to realize that I had to work with her disbelief that one sound, for that shape, was closer to the English “i” as “it” than to “e” as in “get.”

For another student, progress started only when I detected from his mistakes that he was trying to memorize every new word that he met. Once I knew that, I started using techniques which prevented him from memorizing. In a lesson on numbers, for example, I stopped pointing at any sequence of numerals and I increased the speed to such an extent that it became impossible for him to commit each item to memory. Now he started to associate through direct perception, the images with the sounds he heard, with the surprising result (for him) that he could retain them with far greater ease. In another case, it was anxiety that prompted a student to make a mistake which had nothing to do with his knowledge. This was a French teacher whose knowledge of English was fairly extensive. He had been asked if he would accept the sentence, “He took it tomorrow.” He said, “No,” so he was asked ‘to put the sentence right. He then was asked if he saw other possibilities to correct the original sentence. He waited a while and then said, “He tooks it.” It was only after I made him aware of what he was doing that he gave, “He took it yesterday.”

During the feedback session, he described the total confusion his anxiety had caused after the second questions had been asked, and he could see that the mistake he made was due to his state of anxiety. He was very moved by the incident and stated that never before had he thought that he needed to work with his students' states of mind rather than with the content of their mistakes.

From the pattern of one student's mistakes, I realized that taking standardized tests had become second nature to her and she kept on using techniques for guessing at answers even when she could know them by simply looking and listening to what was in front of her.

This student had claimed that she could not hear the distinction between two different Italian sounds, so I called her and asked her to touch on the phonic code chart which of the two sounds she heard in any given word. Her answers were strikingly arranged in a pattern. This made me try to find out what it was that she was doing. When I asked her if she was trying to guess at the answers instead of listening, she admitted that she actually thought of figuring out a "system" into which the two sounds might fall.

The variety of mistakes made by the students is as great as the imagination can conceive, which means that the job of the teacher is just as varied and interesting.

Many people who have watched me teach, remark on the patience they imagine I have. The point is that patience does not enter at all into the picture although the appearance of my behavior may look as though I am being patient. Rather, I am busy studying students' mistakes and trying to find a way to clear their path. Recently one woman could not get the rhythm of an Italian sentence no matter what I tried to do. Finally I tapped the rhythm of the sentence on her hand. That was enough for her to transfer it from her hand to her throat. I did not try to analyze what happened, I only know that it worked.

That mistakes have the power to motivate learning is another thing I never suspected and which I discovered only when I started my study on them. Whenever I start working with a student who has some kind of problem, and make sure that the rest of the class sees what's happening, the class

seems to become spellbound by the difficulties of the student being worked with. I watch myself and others in similar situations and, inevitably, watching a person working out a difficulty seems to make it imperative to those who watch, to start working themselves on the same problem.*

The power of this dynamic is remarkable and knowing that it exists has made a profound difference both in me and the students who witness it. Very soon students lose their self-consciousness about making mistakes and become quite relaxed about them. They realize that their working on some problems will help others to clarify matters. Another very interesting phenomenon is that, by knowing that if they do the right things they will get whatever they are supposed to get, my students become self-reliant and refuse to consider other student's promptings as helpful to them in their learning.

Mistakes can also be intentional and quite powerful as a teaching technique to test students. If the students hear a wrong sequence of sounds in their own language, they will be jolted and will not accept it. If the same thing happens in the language they are learning, when the teacher on purpose gives them a sentence which is incorrect, it means that they possess that portion of the language as well as they possess their own language. If they don't reject it, then obviously they need more work.

When I consider what a difference it has made in my life to have put mistakes in a different perspective, I often wonder how many other things there are for us to look at in a different and more enriching manner.

Cecilia Bartoli

* For example, one woman who knew no Spanish watched a Spanish lesson in which students were struggling with the sounds, the intonation, the melody of that language. After the lesson she was asked what she was doing with herself while watching. She said, "Oh, I was working hard all the time." She was asked why she had worked so hard, to which she replied, "I don't know, I guess I wanted to help." Later in the discussion, she admitted that she thought she had learned quite a bit of Spanish in that half hour, but that she had never thought of that while she was working at it.

Chapter 6

In our constant “making of ourselves,” each finished moment roots us in a unique identity, while each future moment attracts us in an unavoidable movement towards, the unknown. In this encounter with the unknown, with all its infinite possibilities, we also find the possibility of errors.

Our entry in the unknown being a succession of experiments, it happens that we are successful in some and unsuccessful in others; hence, the opportunities for committing errors are for us possibilities for learning. What is important in this experience is to be able to observe closely the errors, putting to ourselves questions such as: why do I commit errors?; when?; what kind of error am I facing?; what does this error tell about myself?; what causes it?; what are its dimensions?; what is its extent?; what do I learn from my own errors?; what do I learn from those of others?; how is an error generated?; how do I distinguish errors from mistakes?

Various factors make it easy to commit an error. We notice its existence when, in some way, we become aware of a disagreement between the result of a “happening” and the realization of what was our expectation of that happening. The time before this awareness of the disagreement explains the production of the error as a misplacement of the energy generated by the self.

Individuals having the propensity to distractions easily displace their energy to centers other than those needing their attention; for them, it is easy to make mistakes. If of such a person a special effort of concentration is asked he finds that, despite his good will, his energy is dispersed, escaping his control. This person becomes aware of his need for a special way of channeling his energy, a way where the self effectively takes control (a kind of auto-re-training), in order to avoid making similar mistakes.

Haste can be a cause in the generation of mistakes. Haste, often, whatever reasons for it, steals the time of reflection and precipitates one into the unknown, thus diminishing our chances of being right. What is to be judged, then, is the tendency to rush irrationally, not the mistakes coming from the rushing. If mistakes are made because of an excess of hurry, one needs to weigh the energy that is mis-spent in the useless effort and in the reconstruction of the mistaken objective.

Carelessness may imply distractions or haste, or both, but it comes as well either from an excessive familiarity with a determined area or from a superficial knowledge of it. The familiarity of the chemist with the different elements that he handles every day is not an excuse for a lack of constant verification of the quantities in which he has to combine those elements; scanty knowledge of the controls of a machine can cause a catastrophe. In both cases care results from the awareness of the possibility of making mistakes.

The awareness of the possibility of mistakes, generated by the awareness of the error itself, develops and increases after the first perception of the disagreement between the expectations and the results. It advises us and it puts us on guard with regard to other mistakes.

The acquisition of a specific skill brings opportunities for mistakes. These mistakes are necessary because they teach us how to approach the mastery of that skill; for instance, a basketball player throws the ball to the basket many times until he is able to know with relative certainty his chances of scoring a basket.

Our ego movements, nourished in excess by the energy of a weak self, can lead us to be confused and from there to commit errors. In this state, when meeting the unknown, the matter does not appear to us as right or wrong knowledge. We refuse to the energy the time for acting and for producing the necessary awareness that would help us prevent the justification of the error or the persistence of it. There are many examples in history of errors originating in the egocentric obduracy of one or some beings. These, in the end, have led to the collective production of the same error.

The diverse emotional factors that affect us as individuals can be magnified under special circumstances. Jealousy, fears, affliction, etc., change our perspective of reality, and the encounter with the unknown becomes distorted. An exacerbated emotion obstructs the equilibrium in the distribution of the energy, giving fine shades to certain aspects of the behavior and ignoring other aspects. Literature is full of examples of emotional errors which lead us to derive conclusions, from a jealous Othello, for instance, or a furious Achilles, or a Phedrain love, or a rejected Medea.

In our encounter with the unknown, all of us meet the awareness of the error a first time. From that moment on, we learn to live with it; we find it so often that we would say in our constant process of learning, there are almost as many chances of erring as of learning.

When we take our first steps, we are only trying possibilities of falling down or of securing firmly our feet, and, in fact, one day we succeed and our steps are confident. How valuable, then, have been our falls! From each one we have learned of the strength of a muscle, or the perfection of the angle of a movement, or a greater confidence in the way to press the foot against the floor, or a better calculation of the distance between the feet when taking the step.

For a poet who wants to fulfill the dictates of the aesthetic taste of his epoch, the gifts from his muse are not enough; he also needs the mastery of the techniques of versification, so he tries numerous times meters and rhymes. This process of errors and successes guides him to the discernment of what is best for his poetry.

In the errors there is a continuous relation to the outside world; because of our capacity of knowing, we approach the matter that in this encounter with the unknown, transforms itself for us into an objective objectifying itself in a way right or wrong. In this sort of approximation the error simply “happens.”

The process of generation of a mistake is a different thing. The encounter is not with the absolute unknown; there is a partial or previous knowledge; consequently, the relationship is not to the outside world, but to what goes on inside a person. The energy of the self is mobilized to relate to “something” in some way familiar. When the displacement of the energy is produced, the will permits the misinterpretation (discoloration, undifferentiation) of a familiar area of knowledge, and the person “makes a mistake,” takes one thing for another; that is, considering unknown elements in lieu of the known ones.

It is possible not to be aware of errors but always to become aware of mistakes, since these appear to us as immediate and evident, and also because they are definite in the sense that we register them as soon as we experience them, since in our consciousness we have criteria to identify them and to face them.

Patricia Perez

Chapter 7

As I examine the writings of my colleagues I see that there are various helpful lightings that can be put on the difference in meaning between error and mistake as one moves into a deeper study of the human questions they bring to mind. At this time I find helpful a lighting which considers errors as the result of mistakes, and mistakes as what a person does with himself inwardly and from which an error is produced. What a person does is to mis-take or mis-perceive some aspects or reality — that is, “take” them for what they are not, or not “take” them for what they are. These mistakes then lead him to act or not act in such a way that an error results.

Those around us who do not relate to us as persons-who-are-learning may see the errors only and either punish us for them or ignore them. Or they may not notice them, and even occasionally mis-take them for accomplishments and offer praise. Those who relate to us on a more human level, may not only observe our errors as a fact, but they may study with us or on our behalf what are the mistakes we make that result in errors. It is this study of the mistakes which generate our errors that makes it possible for us to learn how to “take” reality more accurately so that the errors can disappear.

From this view, in what I write next, I only find it useful to be concerned with mistakes — and more important with the sources of these mistakes. As I examine my own day-to-day living I find that my mistakes have two main sources. The first is lack of some inner criteria needed in the field

of activity where I make a mistake. It may be those criteria which can be gained by using my intelligence and my sensitivity while studying the field (as is found in understanding human relationships), or it may be those criteria based on conventions which culture has arbitrarily established, but of which I am unaware (as happens in the fields of language learning and reading).

The second source is temporarily non-functioning criteria because for any number of reasons, my will is not or cannot be mobilized appropriately to meet all the demands of the given situation at a given moment.

It may be that both sources pertain in many situations because of their complexity. I may be lacking inner criteria for meeting some challenges inherent in a given situation and also my will may not be mobilized in an appropriate way to use criteria I already have for meeting other challenges. It is also possible that one source of mistakes can make the other source come into being. For instance, if I know I do not have criteria for meeting one challenge I can begin to feel self-concern, and then this self-concern can keep my will from using criteria I already have for meeting the challenges. Or, my temporarily non-functioning criteria for meeting one challenge can prevent my entry into experiences needed to form new criteria for meeting another one of the challenges.

The following are instances in which the mistakes come from lack of criteria. For many years I did not have adequate criteria for knowing when my helping people respected their independence. This I only have been able to gain in some measure by using my intelligence and sensitivity in studying human evolution and relationships in my daily living. When I began learning Spanish I had no reliable criteria about when to use two verbs for “to be” in this language, since English has only one. But by noting how Spanish speakers use them, I find I now have reliable criteria most of the time.

Two examples may be enough here to serve to reveal the difference between temporarily non-functioning inner criteria and lack of criteria, but a wider spectrum of examples would be needed to demonstrate most of the reasons why non-functioning can take place.

Recently I was hurrying too much in cleaning some kitchen cupboards to use my will for applying the very precise criteria I have had since childhood for spatial relationships. In reaching a top shelf, I placed the chair I was using as a stool too close to the wall under the cupboard to allow me to keep my balance when I stepped down. The chair tipped and I saved myself from a backward fall by throwing my full weight forward but this resulted in my own hand being painfully caught between the tipping chair and the floor.

Now that I am reasonably sure when to use the two verbs for “to be” in Spanish, I still sometimes use the wrong one because I have not used these criteria long enough for them to become second nature. Because my will is so taken with concentrating on other new elements in the sentence I am uttering I do not give sufficient attention to using consciously my newly acquired criteria about these verbs.

When one considers the second source of mistakes, one can find a number of reasons why one’s will may be inappropriately mobilized and so criteria may become temporarily non-functioning. First, when discipline is lacking, one may not be “with” the task of the moment but with something else such as when being worried about making mistakes, failing, or being “perfect”; being preoccupied, distracted, or worried by something more important to one at the moment; being not interested in the task or the problem being studied; not understanding or caring about the price to be paid for mistakes in this situation; and so forth.

Second, when facility is lacking one may have too many newly formed criteria to apply simultaneously before some of them are practiced enough to become second nature and require much less conscious use of will. Third, when counter productive habits have been formed, energy has been captured by an activity that has become second nature, and the will does not deliberately give itself to withdrawing energy from the habit and restructuring it in another direction where one is less a master. Fourth, when one sees it is to one’s interest to deliberately not use one’s criteria in order to get others either “off one’s back” or to pay attention to one because of one’s difficulties.

If one lighting on education is to look on it as a process of becoming more and more aware of reality as a basis for one's being and acting, then from another viewpoint it can be a process of transforming "mistakes" of reality into true insights to guide us. For me as a teacher this view requires a very complex commitment. It requires first that I be "with" my students, since to be with my ego or with other aspects of my life would be a source of mistakes in teaching. This is needed so that I can be continuously watchful, not merely of errors or of the mistakes which create them, but of the sources of mistakes in functioning both in my students in what they are learning, and in myself as a teacher guiding their learning. In addition I need to find when and why I from time to time make mistakes in assessing these sources. Once my awareness has sorted out better the sources of mistakes, it becomes clearer what action I must take with a student or with myself so that needed criteria are formed and/or existing criteria become functional, and so that in the end my students also become able to study the sources of their mistakes and act appropriately independently of my guidance.

When skills are being learned the task of causing needed criteria to be formed can have a very precise technical implementation. When sensitivities are being developed, precision in teaching seems much more demanding and difficult to achieve. The task of causing existing criteria to become more functional may be very simple and direct — as direct as saying "you're not looking" to a student who makes mistakes because of not using himself in his perception. But it can also require a very complex relationship with the student-as-a-person to be effective. One can witness this in considering a young man who came to us and could soon read anything, but would not read at home or in school because he did not yet wish to become independent (as a person) from his parents and teachers.

All of this tells me that I need as a teacher to be continuously involved in studying how the sources of mistakes come into all aspects of living. So far one of the most effective instruments for me for study is watching myself all day long involved in making mistakes and through this forcing more sensitivity in me for these sources.

Dorothea E. Hinman

Chapter 8

The Use Of Mistakes In The Teaching Of Mathematics

To the mathematician, at least in the field of elementary mathematics, it is immediately apparent what is true and what is false, and for the teacher of mathematics it is the truth, the correct answer, the right reasoning, that is all-important.

In this article, I propose to examine the other side of the picture, to consider the mistakes made by our pupils and to see how they can be turned to advantage in our work as teachers.

There is no disguising the fact that, generally speaking, little or no use is made of the opportunity presented by our pupils' capacity for making mistakes, and yet it is only these mistakes that can throw a light on the significance of our activity as teachers of mathematics. Though obviously we ultimately come to the point at which the mistakes must be corrected and the possibility of their recurrence eliminated, I would suggest that we should do well to curb our tendency to correct, and develop the habit of incorporating into our lessons the observations that we cannot fail to make in marking homework or in using an oral approach with our classes.

It is man's privilege to make mistakes; only through experience, experience that is often painful, does man learn and acquire some degree of wisdom. In the teaching of mathematics, the opportunity for gaining true understanding through experience is too often reduced to the minimum. There is always someone who knows, who can produce the right answer, which is imposed upon those who cannot. But how often must the teacher make the same correction, and how many children reach the end of their school career under the impression that only their more fortunate fellows who are "mathematical" can hope to avoid the mistakes which to them are inevitable?

I would suggest that a different approach to this situation is possible. With the help of my students, I made and analyzed a collection of mistakes made by children learning mathematics, with a view to discovering what could be learned from them. It would not be appropriate here to give the list, and every teacher could certainly draw up his own.

This article was written in 1948 and appeared in the *Mathematical Gazette* in England.

All teachers in secondary schools are familiar with such mistakes, but by no means all see in them an opportunity. For the most part, there is merely an attempt to instill right habits by repetition and drill. Too often we console ourselves, and shirk our responsibility in the matter, by deciding that those pupils who persistently make the same mistakes are dull. In my view, such an explanation is entirely unacceptable. Mistakes are mainly due to mishandling of mental situations on the part of the teacher. How otherwise are we to explain the fact that mistakes are so universal and so similar? Does the explanation not lie in the fact that behind the uniformity of the mistakes there is a uniformity of mental structures of which we are still largely unaware?

Why is it, for instance, that when there is confusion between two operations, the confusion is between addition and multiplication, and between division and subtraction? Why is it that in the proof that parallelograms on the same base and between the same parallels are equal in area, the same obstacle is met by the same teacher every year

with different groups of pupils, and by other teachers in other schools, and that the difficulty is overcome in a similar way?

To my mind, there is here a clear indication that such mistakes can, if we so choose, constitute a guiding light into our pupils' ways of thinking. If we are prepared to learn from them, our teaching will no longer be that of mathematics, but of adolescents engaged in the process of acquiring mental structures that are akin to mathematical structures.

In physics, it is axiomatic that the same part of space cannot simultaneously be occupied by two objects, and this accords with our every day experience. But in geometry, when we have two overlapping figures — a situation only possible insofar as the common element is seen as belonging first to one and then to the other of the two figures — a different principle is involved. This simple fact is, however, overlooked, and we fail to see that the resulting lack of understanding of theorems and proofs must inevitably lead to mistakes. We are prepared to concede that mistakes are related to lack of understanding, but we are not prepared to secure understanding so that mistakes may be avoided. Understanding results from integration in existing structures, or from the creation of adequate new structures. It must mean that we stand “over” the problem in question, whereas the presence of mistakes means that we are in a position of inferiority, and it is the task of the teacher to reverse this situation.

The example given above illustrates the difficulties created by a contradiction between every day experience and a mathematical situation. For many children, such a contradiction presents an insoluble problem; they abandon the effort to understand what is involved and accept the view that mathematics is for the gifted few. The wise teacher, however, will help his pupils to overcome the difficulty by showing them that the figure represents a mental image, and that it is possible to imagine a situation in which actual figures overlap, only because we focus on parts of the figure first in this way and then in that. The wise teacher will remove the contradiction by making it plain that in actual fact there is no overlapping (in the sense that the same space is occupied by two different objects), but that the figures can be

envisaged as if there were. He will thereby create a new awareness, a new structure that goes beyond the empirical experience, a mental experience essential in mathematics. It is this mental structure that intervenes in the child's mathematical thinking, not the idealized object called triangle or circle. Since it is a mental structure, it can be acted upon mentally, and when manipulated mentally it can give rise to other mental situations consistent with the whole of reality, with physics and with every day experience.

And what of algebraic mistakes, so common and so much more obvious than those in the field of geometry? Here again the remedy is understanding, not repetition and drill, and the role of the teacher is again that of discovering the mental structure that intervenes in the algebraic thinking required.

Few teachers teach addition and subtraction together, and division and multiplication together, as different aspects of the same operation. In my view, it is precisely this fact that accounts for all mistakes in the four operations, apart from numerical mistakes. The fact that in our textbooks different chapters are devoted to multiplication and factorization, etc., shows that the separation is deliberate on the part of most teachers. Such an arrangement is presumably intended to isolate difficulties, whereas in reality it merely creates them.

In algebra all operations are reversible. By their very nature, operations constitute pairs. To become aware of the meaning of algebra is to be able to perform both an operation and its inverse with the same ease. Addition and subtraction are two aspects of the same algebraic situation, and are reducible one to the other. It is therefore essential that the pupil who can add algebraically shall at the same time be able to subtract algebraically, thus avoiding mistakes in transferring terms from one side of an algebraic equilibrium to the other. The same holds for multiplication and division.

The mistakes made through confusion of addition with multiplication point to another source of difficulty. In arithmetic, multiplication of integers is repeated addition, while multiplication of fractions is a much more complex algorithm. The same word is used in both cases

because there are connections between the two processes. In algebra also, multiplication yields addition when some of the potential numbers become actual, e.g. when \underline{ab} becomes $\underline{2a}$, but in general it is an operation defined, like addition, by its own laws, and distinct from addition in that the identity operation is 1 instead of 0. This structural quasi-identity of addition and multiplication in algebra constitutes a stumbling block for beginners when numbers vanish into letters, and more attention needs to be given, not to drill, but to the actual formation of the abstract operation, its properties being abstracted from arithmetical situations by the use of problems of the “think of a number” type, as a first step to equations.

Algebra is operations upon operations, and can be grasped without difficulty if it is constructed in this way during the first two years of the secondary school. Operations are reversible by definition, and gain their individuality through specialization, generalization then being the result of the combination of the new operation with those already existing. All the mistakes quoted are due to lack of awareness of the operations involved, and this lack is in turn due to insufficient emphasis on operations by teachers who have a different conception of what constitutes algebra.

The teaching of algebra is the teaching of the dynamics of operations, and this is a self-checking mental activity that requires no other authority than its own smooth functioning. It is for the teacher to create awareness of the mental processes, to bring the structures into existence and let them function according to their own laws. The mistakes which then occur will either be slips, or will be due to insufficient awareness, and will serve to indicate which structures have failed to integrate with previous systems to form new wholes. Once mental structures are present, they impose themselves on the awareness with an inescapable rigor, and determine the framework within which what is true is immediately recognized. Mistakes then no longer have a place; they are spontaneously eliminated through further efforts towards mastery, which is biologically necessary for mental health.

Our responsibility to our pupils demands that we shall not attempt to give norms and right answers, but that we shall use all our skill and imagination to discover the mental structures required for dealing with our mathematical problems, which originated in some mind endowed with those structures.

Caleb Gattegno

News Items

1 “The United States and the World” — an international conference in Washington, D.C.

As one of 100 foreign guests invited to this conference, Dr. Gattegno was asked to produce a paper on what the United States can give the world in the field of education (part of Task 2 that covered social and political issues). Two other papers on the same subject were presented, one by a historian and one by a teacher of Arabic literature.

Although too little time was available for any thorough examination of the problems raised, it was possible to convey to the public what the United States meant to the world of today.

The organizers of the conference were: “The American Council of Learned Societies,” the “American Studies Association” and the “Smithsonian Institute.” It was made possible by a grant from The National Endowment for the Humanities. The meetings took place at the Smithsonian and auditoria of other national societies. The hospitality was so generous that the participants who did not know of United States largesses had a real chance to experience them. In the frame of reference of the bicentennial celebrations the cultural wealth of the nation was presented, coupled with a feel of what affluence can allow in the areas of architecture, arts, musea, etc. The candor of the speakers addressing the full conference also impressed the majority of the visitors, who felt that they should be cautious in their criticism of

the hosts. This criticism was very strong in only one or two cases and that embarrassed everyone in the audience.

The best among the presented papers will appear in one volume sometime in 1977. Together, they cover a vast gamut of topics and show how vital the role of this nation has been in all the fields of endeavor of mankind.

Expectation that the United States will do much more for others in the future permeated almost all the proposals contained in the papers. There was also, here and there, mention of the reverse process, i.e., what the world was doing and could do for the United States.

In the field of education, these two movements were easily illustrated, since Dr. Gattegno comes from outside the United States and operates from New York City, thus creating a bridge working in both directions.

2 Face a l'Education is a voluntary association consisting mainly of teachers from elementary schools in France and Switzerland. It also accepts as members parents and colleagues from anywhere. Initially founded in Geneva a few years ago, it ran seminars for its members and sent some of its most expert ones to work with other teachers, some of whom decided after such experiences to join the association.

The network now covers a vast area of French speaking teachers whose numbers have reached several hundreds, mainly in the neighborhoods of Geneva, Lyons, Bourg en Bresse, Besancon, Marseilles and Paris. The growth of the association became a concern of the committee that had to cater for a variety of needs and make use of a spectrum of talents. Recently they decided to devolve the Association and extend their local activities so as to serve better their provincial colleagues and attract more people to their work. They also wished to specialize and take independent initiatives that better suited individuals in the various areas. They will therefore from now on be known as Face a l'Education Geneva, Face a l'Education Lyon, etc. Since for years they worked closely with us at Educational Solutions, inviting us to run some of the workshops and courses which they organized in one area or another, we have been told that our services may be asked for

simultaneously by the various areas, thus adding to our commitment in the French speaking areas of Europe. Some of the members are considering spending months with us in the United States.

Although we do not know how we can respond to all possible requests, we can congratulate our friends for being so active, so dedicated and so persistent in changing education in France, a country with a rigid system run from above. We look forward to a closer and more extended cooperation in the future between Educational Solutions and the various segments of Face a l'Education.

3 From November 18th to December 1st, Dr. Gattegno visited friends in Europe who are engaged like us in studying how they can serve to improve education. In Paris he found overwhelming the enormous and growing interest in the Silent Way. Literally hundreds of teachers are trying hard to understand, use, and test an approach they find far from easy, though fascinating and effective even in the hands of unskilled workers. Most teachers he met suspect that if they could really grasp the meaning of the subordination of teaching to learning in the language field, they will themselves be improved as persons and educators.

A weekend seminar in Paris concerned itself with the topic, "Since only awareness can be educated in man . . .," which was to reveal to a good number of those who attended the meaning of awareness — a meaning strangely lost to most people. The French language does not help either, since conscience and consciousness are expressed with one word only (the first), leading to confusing psychology and ethics. Exercises helped to generate distinctions which were as much felt as thought about.

A lecture in Besancon was planned to introduce newcomers to our thinking. As usual, some felt uplifted, some threatened, and some irritated, according to where they stood personally facing education and self-education. In that same city in the morning for more than 3 hours, 22 hearing-impaired children (7-14 in age) worked continuously, joyfully and profitably on the French language (spoken and written) and on fractions in mathematics. The observers felt as if

some curtain had been raised on dramas they could not conceive as they saw children act as they never thought they could.

A weekend seminar in Geneva (one day longer than the Paris one) was devoted to “Back to basics and more.” The large group involved saw what it was to meet the needs felt by parents, employers and the general public, and still affect education to better prepare children for their own future.

A mathematical film (part of Nicolet’s Animated Geometry described below) was used to show how a large class of students (mostly ignorant of geometry, traumatized and many even hating mathematics) can be stimulated to make progress in a short time if we use the proper means and work in a manner we call the subordination of teaching to learning. Video tapes made for language teaching were also used to involve individually up to sixty adults in one class for a whole hour. The evidence was that we now know how to satisfy the most demanding parent while we serve teachers who are open to change their ways in order to serve their students.

The truth that only awareness is educable in man was made more apparent to many adults than had been hoped for before those brief but intense encounters during those two weeks.

4 Our colleague, Dr. Cecilia Perrault, during October and November gave seminars on the Silent Way and courses in the Italian language in Paris, Geneva, Athens and Vancouver B.C.

In great demand because of the way she meets the needs of participants, Cecilia has found herself working seven days a week for five solid weeks. While learning a lot because of the idiosyncrasies of the people composing the various groups, she taught much, as is acknowledged by the many messages received from participants. A common remark was that her firm grasp of the essentials and her personal discipline were contagious and forced people to concentrate more than usual and to reap the benefits of serious studies.

Once again she is invited to return to meet those who worked with her earlier and to meet newcomers clamoring for a chance to study with her.

5 Our readers have been used to receive information about our projects in the making. The J. L. Nicolet series of Animated Geometry which he worked on since 1940 and until his death, taught us that the visual medium was much more powerful for the making of mathematicians than the verbal approach found everywhere in schools at all levels.

Next month we shall make available a remake of a total of five of his films which will be in color, computer animated from scenari incorporating all the ideas that moved Nicolet when he made his films. Dr. Gattegno, who produced these five films, intends to prepare a booklet to help teachers use these extremely beautiful visual stories that force awareness of spatial relations and mathematical facts as no other medium has been able to do so far. The several hundred people exposed to them have been unanimous in telling us that they feel a new era in the teaching of mathematics is upon us.

We share this view.

Book Reviews

1 “Memory, Meaning and Method, by Earl Stevick (Newbury House publishers, Rowley, Mass. 1976).

Earl Stevick is a scholar and a teacher. Traveling the world over; he has come to be respected for his sound judgment of and insight into what is valuable in the field of language learning and teaching. People do listen to him, particularly since he goes to the people to share his discoveries and they learn much from this very able teacher.

Now he goes to all teachers through this publication that covers in 177 pages a considerable area. Stevick has chosen to organize his material in three parts. The first is devoted to memory, by which he puts at the disposal of his readers all the research he thinks is relevant to teaching languages. The second is devoted to the personal aspect of meaning and the way one connects it to words in a new language. In this he takes a psychological approach to students facing the demands of new languages. The third part is concerned with some methods and teaching approaches and his thinking about what makes good teaching; it includes a thoughtful presentation of what he has found in the field as judged against his standards.

It is clear from reading this text that Stevick does not conceive of language teachers as narrow specialists. He wants them to be like himself: open, receptive, critical and ready to experiment and to test. So he gives them much to work on and does it systematically and

thoroughly. He does not hide his liking and leanings, but he justifies them on the basis of either practical success or failure or philosophical foundations. Thus readers know where he stands and why, and he invites them to find out where they too stand and why.

In spite of its slimness, this book requires very careful reading precisely because Stevick found that we cannot improve ourselves as teachers unless we work on all the vital components of the situation, of which a large number are mentioned under the three headings in the title, to which he adds a thorough teacher preparation.

Since Stevick does not need any supportive introduction to the public for his book to reach a very wide audience, this brief analysis of his latest work is only a way of saying: “We have noted what you have done and think that our friends should too.”

2 “The Common Sense of Teaching Foreign Languages” by Caleb Gattegno, Educational Solutions Inc. New York City 1976 (\$5.95).

Readers of Dr. Gattegno’s previous book, “Teaching Foreign Languages in Schools,” will recognize that this is a text to help language teachers gain a deeper understanding of The Silent Way. But it is much more than that. In fact the choice of the title alone may convey that the field of language teaching is examined from the point of view of the learner and that this can lead to common sense conclusions acceptable to most language teachers. The stress on freeing students is novel, but it may quickly become a shared attitude of readers who think that indeed the goal of language learning is to become as fluent and as unconcerned with the language as natives are. When natives speak or write, they give their energy to the meaning they wish to convey, not to the words, although some energy may be reserved for the form.

The author recommends that the text be read aloud when the reading is difficult. In a way this recommendation itself falls within the realm of freeing oneself. In fact voices carry much of the energy which contributes to comprehension of the affective component present when people speak but missing when they look at a text. There could have been another solution to the meeting of the obstacle of comprehension

had the book been more carefully edited and a number of sentences rewritten.

Because of the insights the author shares with his readers, they may forgive him for daring to write in a language he has not mastered. These insights are so numerous and so important that teachers may wish to keep this book on their bedside table to consult again and again when they consider their problems.

The chapter on evaluation is worthy of special attention. In it, Dr. Gattegno gives teachers a great deal that cannot be found anywhere else. The idea of continuous feedback is by itself very helpful. But to find so many ways of using it is even more valuable. Perhaps one day a sufficient number of teachers using continuous feedback will produce a scale to assist others in their evaluation.

The appendices in French, Italian, Mandarin and Spanish, will be of help to those teachers who need examples to be worked out for them. Since English is used for the main body of the text, the English materials receive considerable exposure. But since the Silent Way has been developed for more than twenty languages, the appendices indicate that the writer could have written such a book for other languages as well.

In this book, the practitioner as well as the theoretician will encounter much that he will treasure.

New Publications

Three texts by Dr. Caleb Gattegno will be published and appear as restricted printings, as a few previous titles have been:

- 1 Chapter 4 of the treatise, The Science of Education, will be out first in the next few days. It is entitled, “Affectivity and Learning.”
- 2 An essay “On Love.”
- 3 “Evolution and Memory”

The last two will follow a few weeks from now.



About Caleb Gattegno

Caleb Gattegno is the teacher every student dreams of; he doesn't require his students to memorize anything, he doesn't shout or at times even say a word, and his students learn at an accelerated rate because they are truly interested. In a world where memorization, recitation, and standardized tests are still the norm, Gattegno was truly ahead of his time.

Born in Alexandria, Egypt in 1911, Gattegno was a scholar of many fields. He held a doctorate of mathematics, a doctorate of arts in psychology, a master of arts in education, and a bachelor of science in physics and chemistry. He held a scientific view of education, and believed illiteracy was a problem that could be solved. He questioned the role of time and algebra in the process of learning to read, and, most importantly, questioned the role of the teacher. The focus in all subjects, he insisted, should always be placed on learning, not on teaching. He called this principle the Subordination of Teaching to Learning.

Gattegno travelled around the world 10 times conducting seminars on his teaching methods, and had himself learned about 40 languages. He wrote more than 120 books during his career, and from 1971 until his death in 1988 he published the Educational Solutions newsletter five times a year. He was survived by his second wife Shakti Gattegno and his four children.