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**Generalized Emotion**  
**How it May be Produced, and Sentic Cycle Therapy**

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**I. Introduction**

In this chapter we are concerned with a novel, yet natural way of producing emotions using dynamic expression and touch as a mode for the precise expression of emotions, and as a special, new art form. This way is outside the life-line of an individual, i.e., does not depend on events happening to that person, is controllable, easily achieved, tells us much about the nature of emotion and its communication and results in preventive and therapeutic applications for emotional balance.

First discovered in 1968 (Clynes, 1968, 1969, 1973a), it probably is still new to many psychologists. Indeed, it can seem novel and perplexing from a social perspective not quite unlike had music been invented for the first time. (Like music, it selectively engenders and utilizes generalized emotion.)

Among the advantages of this form of producing and expressing emotion - which uses dynamic finger pressure - is that it permits emotion and its properties to be carefully studied in several aspects, and it is very easy to learn, unlike music. The therapeutic/preventive method of generating and experiencing a sequence of emotions is called Sentic Cycles. We shall describe results with over 1,000 subjects, in this regard. First, however, it will be helpful briefly to consider the nature of emotion, in order to better understand the method.

In our age of information processing and communication, the dynamics of the remarkable, highly ingenious and precise systems of communicating emotion which nature has evolved (including coordinated function of production and recognition, of sending and receiving) have received comparatively little attention, especially as applied to man.

In man-made information processing systems the transmitting units (consisting of zeros and ones) have no meaning related to the messages. In nature's system of communicating emotions the message units themselves have analog (spatiotemporal

form) features that act like keys in locks of our nervous system; the language, sender and receiver are co-designed with vocabulary and meaning evolved by nature.

The ability for the communication of emotion to be a link between individuals, a window across individual isolation, makes these processes central to our existence, and reveals much about the nature of emotion, and thus about human nature.

Indeed, an approach to the question of what kind of entity constitutes an emotion is to consider those qualities of experience which can be communicated by means of direct temporal expression. If the contagion of qualities of experience is selected as a common property we obtain a class of qualities of experience nearly all members of which are commonly called emotions. Love, grief, joy, anger, hate, laughter, sexual excitement, reverence, hope and fear may be propagated through dynamic communication, by using the tone of voice (even for example through the telephone), expressive gesture, facial expressive movement. (Yawning is also contagious in this sense, but is not usually classified as an emotion.)

There seems to be a class of qualities of experience which are inherently linked with the motor system, and their expression and state may be considered as a single existential entity. Such a category includes most emotions. Other emotions, such as jealousy, or guilt are not communicable through a contagious process of expression (and thus also are not encountered in music). It turns out that this second group of emotions is largely similar to those recently termed “social emotions” (eg. Zivin 1987); as distinguished from the “biological emotions”.

A number of important aspects of the nature of emotion have become clear in the course of working in this direction (Clynes 1969, 1973a, 1977). Foremost among these is:

- *The Coherence principle*, that there is a biologically given coherence between a basic emotion and the dynamic form of its expression; and further, that:
  - For a given output mode, the closer to that ‘pure’ form the expression, the more effective it is.
  - A key-and-lock relation programmed into the central nervous system is seen to exist between the expression and its power to generate emotion, both in the person expressing and in the perceived
  - Production of the dynamic form, possible by means of various motor output modes, and its recognition are found to be coordinated biologically by the central nervous system, thereby permitting contagion of emotion. (For a very clear but little studied primitive example of this, consider yawning.)

## Emotion as an Entity

Consider then further, what kind of entity is an emotion - that extraordinary entity which we thrive on, battle, that we like and not like to control, that affects our energies and governs our dreams? That makes living so worthwhile, or so unbearable?

Because emotion does not connect directly to the environment through known sensory structures, as does vision and hearing for example, its distinct qualities have not been accorded the same scientific credence as universals as have color and sounds. There was much doubt, in the first half of the twentieth century, that they are indeed entities.

Around 1800, at the time of Schiller and Goethe, the various emotions were regarded as distinct natural phenomena of considerable interest (Schiller, 1803), involving mind and body. This view, however, became side-tracked after Darwin, in spite of his own seminal contribution to the study of their expression (Darwin, 1872) - as the *Zeitgeist* became survival and conditioning, rather than study of inherent mind - body windows. Through recent discoveries of numerous and specific neurohormonal transmitters and receptors, and of specific ‘circuits’ as sensors within the brain for producing particular emotions (see Panksepp, this volume, and 1986), the qualities and the spectrum of emotions are becoming amenable to be identified and isolated as existential entities, as happened with chemical elements at the time of the elaboration of the periodic table (we may even begin to consider scientifically the evolutionary development of the quality of life). Establishing these can be expected to have

vast though not immediate consequences on the social fabric - on the aims of society and of the individual. To be able to alter an individual's emotions at will with specific interventions opens up challenging and dangerous avenues for the future. But note, we already have had one way of doing just that for thousands of years: man's invention of music !

A number of distinct qualities of experience demand to be named: joy, anger, grief and love for example are found in virtually all languages. But of course to be named by language is not a guarantee of an existence as a simple entity; complex and mixed phenomena may have simple names; sometimes the naming is, to a degree, confused and confusing; other emotions remain nameless. At times a similar emotion but of different intensity is given a different name: for example anger, rage. Here language draws our attention to the fact that the entity 'emotion', as a quality of experience, has intensity as well as particular quality - as do sensory qualities - an aspect that our view of brain function in regard to emotion must accommodate.

An emotion requires consciousness to be felt: it is a characteristic of consciousness that emotions may be experienced. In that aspect it is not very different from sensory perception. We do not know today what brain functions permit these varied qualities to be experienced, and how a particular unique experiential quality is produced in the brain. Because we do not know this and since that is a very uncomfortable state of affairs, we tend to sweep that whole question under the carpet, i.e. repress it, and declare (eg. Minsky, 1987) that there is no problem in grasping how red looks red, and sweet is sweet and so on. This view would hold that there is no problem to understand, from a brain function point of view, how anger feels like anger, how love feels like love, joy feels like joy, and so on. I consider this question, however, to be a real question not a pseudo question and one central to understanding brain function in perhaps its most intriguing aspect: how it gives rise to consciousness. This is not to posit a "little green man" who looks at a screen inside our brain and an infinite regression of such little men. (In fact, we see a screen inside (in front of) our head which turns when we turn our head (note this with eyes closed) but not when we turn our eyes.) Conversion of discontinuous events in the brain - nerve firings, aggregation of molecules - to continuous experience of a considerable number of distinct qualities is an unsolved, and centrally important scientific question.

We need to look at 'circuits' in the brain attributed to particular emotions (Panksepp, 1982,1986) in that light also. We know that there are many places in the brain and the nervous system, whose stimulation produces a sensory experience of "red" when stimulated electrically ( and probably also chemically) - at places on the retina, along the optic nerve, at the visual cortex - but those structures, while essential to normal vision, are not where vision is experienced. Likewise, 'circuits' in the brain which, when stimulated, give rise to the experience of a particular emotion may not be the structures with which the emotion is in fact experienced. These circuits ('pathways' maybe a more appropriate term), may also be seen as input stages towards such experience, analogously to the sensory input pathways and processing structures of the nervous system as those of the ear or retina, but with the difference that they pick up stimulation from internal sensing stations (Clynes, 1973a), rather than interfacing with the external environment. At present we are in a position where we cannot distinguish, so to speak, between the light switch and the light - but it is nice to know where the switch is! While we know how to turn on an emotion, we have no idea with what brain structures they obtain their particular feel, or their cognitive correlates. The same is true of the experience of hunger. Seemingly, genetic elucidation shall help us towards answers more readily than neurophysiologic observations alone.

When an individual dreams of a particular emotion, he experiences it vividly, with very similar quality as in the wake state. Yet probably much of the brain "circuitry" attributed to generating that particular emotion is not active in the way it is when the emotion is experienced in the awake state - a different "switch" may be used. We should therefore be careful to

avoid saying that the quality of emotional experience is due to the brain circuits that have been identified, which, when stimulated, give rise to emotional experiences. With this caveat, it is clear (at least for some emotions) that both the quality of an emotion entity and its intensity can be elicited by stimulation of appropriate brain structures, either chemically or electrically.

## **What Produces an Emotion?**

Let us list then how emotion may be produced:

### ***1. Electrical or chemical stimulation***

Appropriate stimulation (or disinhibition, like with the visual receptors concerned in seeing black) at the right places in the brain.

### ***2. The cognitive interpretation of events (K1)***

The most common way. We may suppose that in the course of cognitive interpretation of events which give rise to an emotion, the brain functions referred to above appear to be stimulated through particular pathways. (Such cognitive interpretation is influenced by character structure, and may be in part inherent and biologically determined, and in part learned culturally and individually). We shall call these input cognitions K1, and distinguish them from output cognitions, i.e. cognitive effects produced by the emotion, which we shall call K2.

### ***3. Recalled emotion***

Emotions may be stored in memory, accessible to recall, or not readily accessible, repressed (repression may be partial, so that some of the body effects remain, though devoid of conscious emotional significance). (Little is known yet of how the emotion brain circuits link with unconscious aspects of emotion, such as processes of repression, for example.)

### ***4. Emotions produced in dreams***

Emotions can be experienced in dreams, but more remarkably, they can generate dreams. Stored emotion and spontaneously arising emotion both may function in dreams. Emotions released from memory may or may not affect specific brain circuits to which we have referred, and may affect them differently depending on whether they are experienced in dreams or in an awake state.

### ***5. Communication and generation of emotion through expression***

It is part of the entity of emotion, for most emotions, that there is an urge for expression. The entity emotion is linked in an inherent way to motor outputs and these - sounds, facial expressions, touch or gesture - are perceived and act contagiously to generate the emotion that is expressed in other individuals, a social function. But this generating action also acts on the individual who is expressing so that we may speak of auto - or cross-communication of emotion. In this mode, as with electrical or chemical stimulation, the emotion may be generated without cognitive reason other than the expression itself - there is no K1 required.

Perceptions such as warmth, sunshine, colors, and so on, may evoke some emotional qualities directly, involving neither expression of a living organism, nor substantive input cognition.

Although in daily life emotion is frequently associated with K1, this is not always so; and is largely not so in music, dance and art. For example, joy or anguish in Mozart's music may be

experienced without a cause, other than the music itself. In acting, there is partial involvement with K1.

(Current views and controversies in the field concerning the relation of cognition to emotion may be found in Leventhal and Scherer (1987), Lazarus (1984), Zajonc (1984), Oatley and Laird (1987). These reports are little concerned however with generating emotion through dynamic forms, and with cognitive aspects of this.)

## **Cognitive Output Function Effects of Emotion: K2**

Emotions are involved with cognition not only at the input but they affect cognitive processes as an output - they are not only stimulated by cognitive evaluation of events but they affect cognitive thought and thus decisions and action. In this they resemble “instincts” (it would seem “instincts” (a no longer useful word hiding our ignorance) are in fact, most likely, particular emotion). We may thus look upon emotion as an ‘invention of nature’ to incorporate aspects of knowledge in a hardwired manner for particular functions (see also Plutchik and Scott, this volume).

Among the first such inventions of nature was hunger. (The word ‘nature’ appears to impose itself upon the sentence: clearly, however, there is no nature. only the universe and its laws - we thus must consider ‘hunger’ to be a result of universal laws and biologic organization, and as an entity partaking both of body and mind). Here we see as an example that the biochemical function of chemotaxis in primitive organisms - the automatic ability to move to where needed food is sensed to be

becomes a function of consciousness. The entity ‘hunger’ carries the meaning and information required - it tells the organism when it needs to eat, that it needs to eat, what it needs to eat and how much. (Note how selective that knowledge is: a hungry person who likes cake, still will not wish to eat more than say 4 or 5 pieces of cake even though still hungry, and will then want to eat something else.) This knowledge is present in the feeling of hunger.

Likewise, emotions appear to affect cognitive functions in specific characteristic ways. This “knowledge” carried by the emotion as an output function is part of its nature and cannot readily be separated from it. We may consider that many aspects of this “knowledge” would be invoked regardless of the mode of stimulation of the emotion, i.e. regardless of whether it was produced through the interpretation of an event, or through chemical or electrical stimulation of appropriate brain circuits, or indeed through dynamic expression. We shall call these output cognition effects K2.\*

An emotion can at times provide its own, continuing motivation, regardless of how it came to exist: whether by interpretation of events by electrical or chemical stimulation, or through expressive communication, providing a (limited) degree of predictability. In that way, too, it resembles instincts. (The concept of motivation, a rather ill defined tool of trade of traditional psychology, here acquires a special meaning: see Scott, this volume.)

The cognitive output substrates of specific emotions, K2, are characteristic for each emotion. In order to study them we need ways to produce emotions reliably and repeatedly in the laboratory. This has been very difficult, particularly so for positive emotions. Mostly, subjects have been exposed to emotional scenes, or are given hypnotic suggestion in order to produce emotion. With the method of generation reported here, however, it is readily possible to generate positive as well as negative emotions in humans, and to study and observe aspects of the cognitive effects (K2) of joy as well as anger; of love as well as hate.

\* It is proposed that K1 and K2 may also be called “kick -” and “float-cognitive” aspects of emotion, respectively; this suggestion refers to Kids initiating function, and to the K2 effects that are similar regardless of how the emotion was started.

## **II. Generalised Emotion: Its Production Through Repeated Touch Expression**

Generalised emotion is emotion generated without KI i.e. without a cause in the lifeline of an individual. It may be generated either by repeated expression, or by electrical (or chemical) stimulation within the brain. Electrical stimulation has been comparatively widely studied, particularly in animals, but the systematic study of generating emotion through repeated expression is relatively new. Though we first were drawn to the power of precise dynamic expression to generate emotion through music, it became clear that this ability of music is only one example of a wider and fundamental property of the central nervous system and of emotion. It was found first in 1968 that a similarly powerful generation of emotion in this manner is possible through touch expression when organized in an appropriate way. Moreover the technique to master this turned out to be extremely simple compared to music, and requires no “musical talent”.

To learn what the required organization is for this to occur, sheds light on the nature of emotion and its communication, on personal relationships, and on those arts that use dynamic expression to communicate. We shall describe briefly how we have studied this natural and artistic way of generating emotion over a period of 20 years.

### **Essentic Form Measurement**

That expressions of a particular emotion tend to have a certain dynamic character, i.e. space time form, may be considered common knowledge. For example a sad person might sigh, a person experiencing joy might jump, an angry person may make an angry gesture, a person expressing love may caress, and so on. Such expressions might be carried out by various parts of the body, and various output modalities. One may posit that the expressive nature of the gesture or movement should lie in the dynamic way in which the movement conveys the emotional quality, no matter which part of the body or, we might suppose, which output modality may have been used. Making this postulate, one might be able to identify this characteristic dynamic form for a particular emotion (which we may call “essentic form”) ideally by using a movement, or motor output, that is confined virtually to a point so that non-essential movement would not be conjoined. (Studies of facial expressions, such as those of Ekman and Friesen (1984), do not generally determine dynamic profiles of the expression, but largely use static cross sections, taken at some “favorable” instant.) In 1967 we decided to search for these forms through expressive pressure of a single finger on a Sentograph, an instrument built for this purpose capable of independently measuring vertical and horizontal components of finger pressure (Fig 1).

If we could isolate the specific dynamic forms of the expressions of particular emotions through measures of dynamic finger pressure, it should be possible to apply these forms to other motor outputs and modalities. One could attempt to apply them to sound patterns, for example, and see if these forms transformed into sound indeed conveyed and generated the same emotional qualities as the finger pressure expressions from which they were derived.

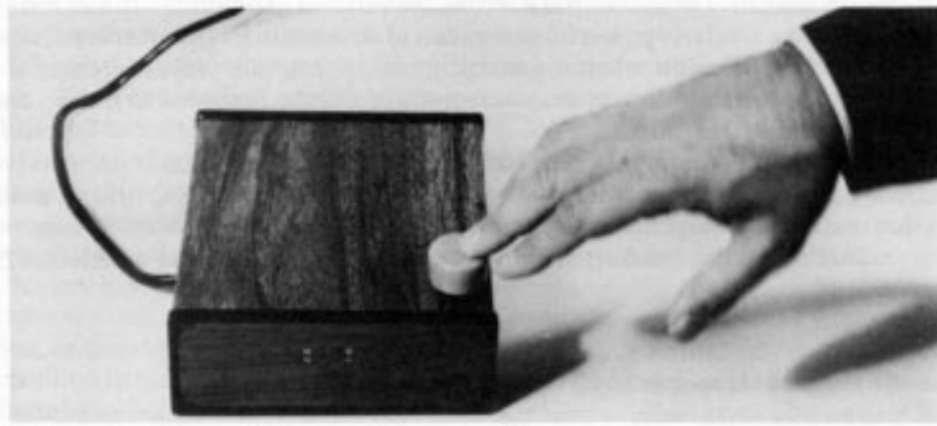


Figure 1. Sentograph for measuring dynamic expressive forms. Vertical and horizontal components of finger pressure are measured independently through built-in cantilevered strain gauge transducers, and may be recorded on a chart recorder or stored and averaged in a computer. (From Clynes, 1973b).

## Generation through Repeated Expression

To be able to do this it was necessary, first of all, to generate the emotions concerned. In the past it had been generally difficult, if not impossible to repeatedly and reliably generate human emotions under laboratory conditions, and particularly positive emotions, such as love and joy. It became apparent quite soon however, that an emotional expression, repeatedly expressed in an appropriate way would generate its own emotion. A person required to express a particular emotion by finger pressure could generate that emotion by repeatedly expressing in the appropriate way - and could so to speak, bootstrap his emotion in that manner. This was possible for quite a number of emotions. If this is so, we need to ask, what is the “appropriate way”, and what does it mean that there is an appropriate way?

1. It became clear that for each emotion there was a characteristic dynamic form of expression, a form with a beginning, middle, and end, and a particular duration. A subject soon discovered what form felt right, and that form was most effective also in generating the emotion (it turned out later that these forms were largely similar for different individuals). The subject could then produce this dynamic form to generate the emotion through repeated expression.

2. It was discovered that the manner of repetition significantly altered the ability to generate the emotion. The repetition had of course to allow each expression to be completed, i.e. a new expression could not start before the previous one had completed its course without blocking the emotion. *Each emotion had a different duration for its expression*, so the maximum repetition rate would be different for each emotion. But it also became apparent that a precisely regular repetition was counterproductive; it then quickly became boring. For most emotions a slight pause of varied duration between expressions produced more effective emotion generation. That allowed the expression to be renewed and experienced freshly rather than as a mere repetition.

Moreover it was better that timing when to begin the next expression was not the responsibility of the person who was expressing but was provided externally, by a soft click. In this

way an aspect of dialog is achieved; the small interval between expressions seems to permit one to relate to otherness in a way that is not possible if one produces a self-timed chain of expressions. (The full reason why this is so is still not entirely clear. An interesting clue, however, is that if the initiation cue is provided by the contralateral hand, it goes a considerable way towards achieving the effect of an external cue: activation of the other hemisphere of the brain to give the initiation cues seems to produce some of the “dialog” effect that the external cue provides).

Thus, when the emotion called for was expressed repeatedly with its characteristic dynamic form, and initiated by an external cue (soft click) that allowed a small and variable interval after the completion of each expression, then the expressions were most effective in generating the emotion.

3. It was further found that when the timing cues were optimized for one individual they appeared to be close to optimal for other individuals. That is, the timing of these expressions both in regard to their own duration and to the small pauses appeared applicable to subjects in general.

The resemblance here to music is striking: Music would not be possible if the timing effects were not shared by listeners.

It may typically take say 5 - 10 expressions to appreciably generate the emotion. Then there may be 10 - 20 expressions that are felt to adequately or fully express the emotion, with some fluctuations of intensity, and then often there may begin a satiety phase during which the intensity of the emotion gradually diminishes. After the emotion is thus dissipated, it is very significant that the subject is quite unsated towards expressing a different emotion. This *differential satiety* has been suggested as a way of distinguishing basic emotions (Clynes, 1973a, 1977, 1980), and also noted

as suggesting the existence of specific receptors and chemical transmitter substances (Clynes, 1973a) that would cause the receptors to be occupied, or clogged, producing satiety.

If the emotion concerned had previously been appreciably repressed, or had been acutely experienced by the subject before beginning the procedure, it would take longer to satiate.

Because the subject *senses the emotional effect of his expression* - as a psychobiological feedback - he also discerns whether each expressive form he has used is appropriate or not: if not, the emotional effect he otherwise senses is not present. This phenomenon helps him to correct deviations in the expressive form. The experience of the expression is a homing function that leads to executing improved expressive form - it is self teaching. The teaching involved, however, is merely discovery of the natural dynamic form of expression for that emotion - as produced with finger pressure.

This form, corresponding to an inner gesture, is found to be not capable of basic modification in its link to a particular emotional quality. The forms are not arbitrary, but are found to cohere inherently with the emotion that they express. Coherence between the dynamic form of expression - capable of many, varied representations in different output modes - and its emotional quality is confirmed in numerous ways by the body of findings of these studies.



### III. Experimentation with Essentic Form

#### 1. Isolation of Specific Essentic Forms

With this method of generating emotion, expressive dynamic forms of specific emotions were measured in groups of subjects in different cultures. In these experiments subjects sat in a standardized position and expressed emotions with finger pressure of the middle finger of their dominant hand on the finger rest of the Sentograph, as initiated with a soft click from a timing tape prepared for that purpose according to the principles to be described. 50 expressions of each emotion were measured and averaged for each subject. Subjects readily experi-

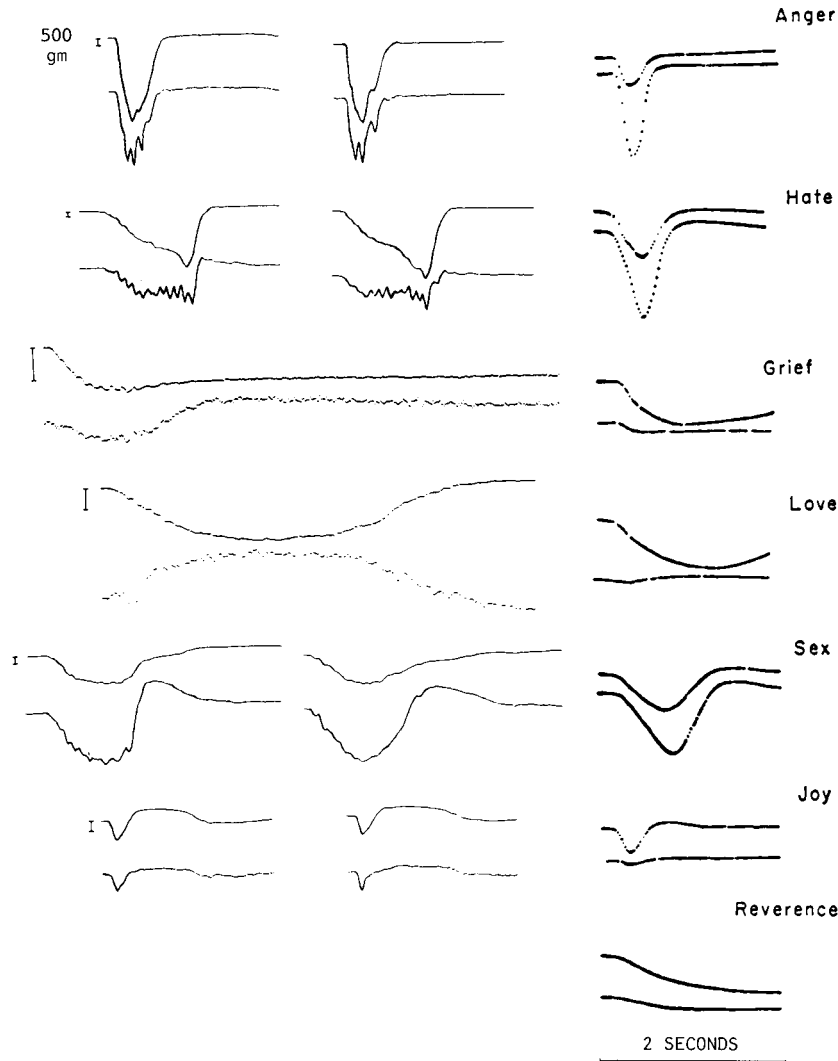


Figure 2. Examples of sentograms of the essentic forms of emotions. The upper trace for each emotion is the vertical component of transient finger pressure; the lower trace is the horizontal component (shown at 3x magnified pressure scale). On the right, each form is an average of fifty expressions, reproduced from Clynes, 1969. On the left, recent recordings of single expressions are shown. An approx. 10 Hz tremor is notable to a various extent in specific portions of the forms, particularly in the horizontal components of hate, anger, and sex. These and some other characteristic details are hidden by the averaging process; the latter however gives quite a good measure of the specific form for most emotions. Subtle differences in forms (e.g. between love and grief) may be as significant as more obvious ones. Reprinted from Clynes and Nettheim, 1982.

enced the emotions concerned (fig. 2). In these studies they were not asked to make the emotions as intense as possible, but rather with each expression to express as precisely as possible the emotion asked for. In doing this some subjects imagined scenes and incidents to help them generate the emotion. But most subjects found that soon they could generate the emotion concerned without the aid of particular fantasies, merely through the acts of expression. Moreover, having generated the emotion in this way, fantasies might then arise involving the emotion.

*Choice of Emotions.* The emotions chosen to be studied in this way were anger, hate, grief, love, sex, joy and reverence. These emotions are contagiously communicable - an important criterion for this research, and one that delimits a category of emotions. Concerning this choice, I should add that to a musician of my kind it is clear that love and reverence are communicable basic emotions in great music, such as in the music of Beethoven, Bach, Mozart, as well as in Indian classical music, for example. The others, except for hate, are generally accepted as belonging to the basic set of emotions (fear was not studied because its expression does not lend itself to be measured in this way, as it is a withdrawing).

In this way we isolated the essentic forms of these emotions, and found, in a limited initial study, that they appeared to be *universal human characteristics*; they varied no more between groups in different cultures than among individuals within one group (Clynes 1973a).

## 2. Correspondence Between Production and Recognition of Essentic Form

Experiments were then carried out to test the correspondence between dynamic emotion expression and its recognition (Clynes and Nettheim, 1982). In a first experimental study, subjects were tested to see whether executing the motoric action of the hand involved in producing expressive finger pressure would be recognized as expressing the particular emotion concerned. In the first of a series of such experiments, 50 subjects (25 male, 25 female) were taught these seven motoric patterns as motor skills, without any indication that they represented emotional expression. Having learned them in a half hour learning session, seeing only the hand of the instructor, they were then asked to assign emotions to the motoric patterns, from a randomly ordered list of these seven emotions as a forced choice test. Results proved to be very successful and significant, with all seven emotions correctly scored by more subjects than any other score, and errors of choice being mainly choosing hate for anger and vice versa. Only 10% of subjects confused love and sex, for example, and each of the seven emotions were recognized correctly by 63-84% of the subjects. Males and females did equally well.

In a second series of experiments subjects watched a film of the hand (and part of the forearm) expressing those emotions with finger pressure, (chart traces of finger pressure were not seen by the subjects). Ten expressions of each of the seven emotions were shown to 232 subjects (116 male, 116 female). Recognition was even better than in the motor skill experiment. Emotions were generally identified correctly in over 80% of the choices, with 40.1 % of the subjects getting all seven emotions correct. 21% of the subjects confused love and reverence. However, only 14% confused anger and hate, and vice versa, about two thirds the figure found with the motoric experiment. Males and females, here too, did equally well. There was no significant difference between males and females in their recognition of any of the emotions, including sex, as also in the motoric experiment. In both sets of experiments, confidence indices obtained showed that subjects were more confident of their choice when it was a correct choice.

These experiments confirmed that the dynamic patterns involved in *expressing* the particular emotions were also *recognized*, i.e. they confirmed the biologic coordination of the nervous system in the production and recognition of dynamic emotion communicating forms.

# Transforming Touch Expression to Sound Expression

## *Transformation of Pressure Essentic Forms to Sound Essentic Forms*

The postulate that essentic forms are in a sense more primary in terms of brain function than their realization in any of the sensory output modes was tested by first obtaining transforms of pressure dynamic forms to sound forms that expressed the same emotion, and noting the required nature of that transform. The resultant sounds were tested on subjects to see whether they indeed recognized the corresponding emotions.

The first aspect was solved by making frequency follow the pressure contours and by shaping the amplitude contour similarly, with the additional constraint that the amplitude had to start and end on zero. The polarity and range of the frequency deflection was different for different emotions. But the dynamic form, i.e. the time course, was preserved inviolate for all emotions.

Details of the transform are given in figures 3 and 4, and Table 1.

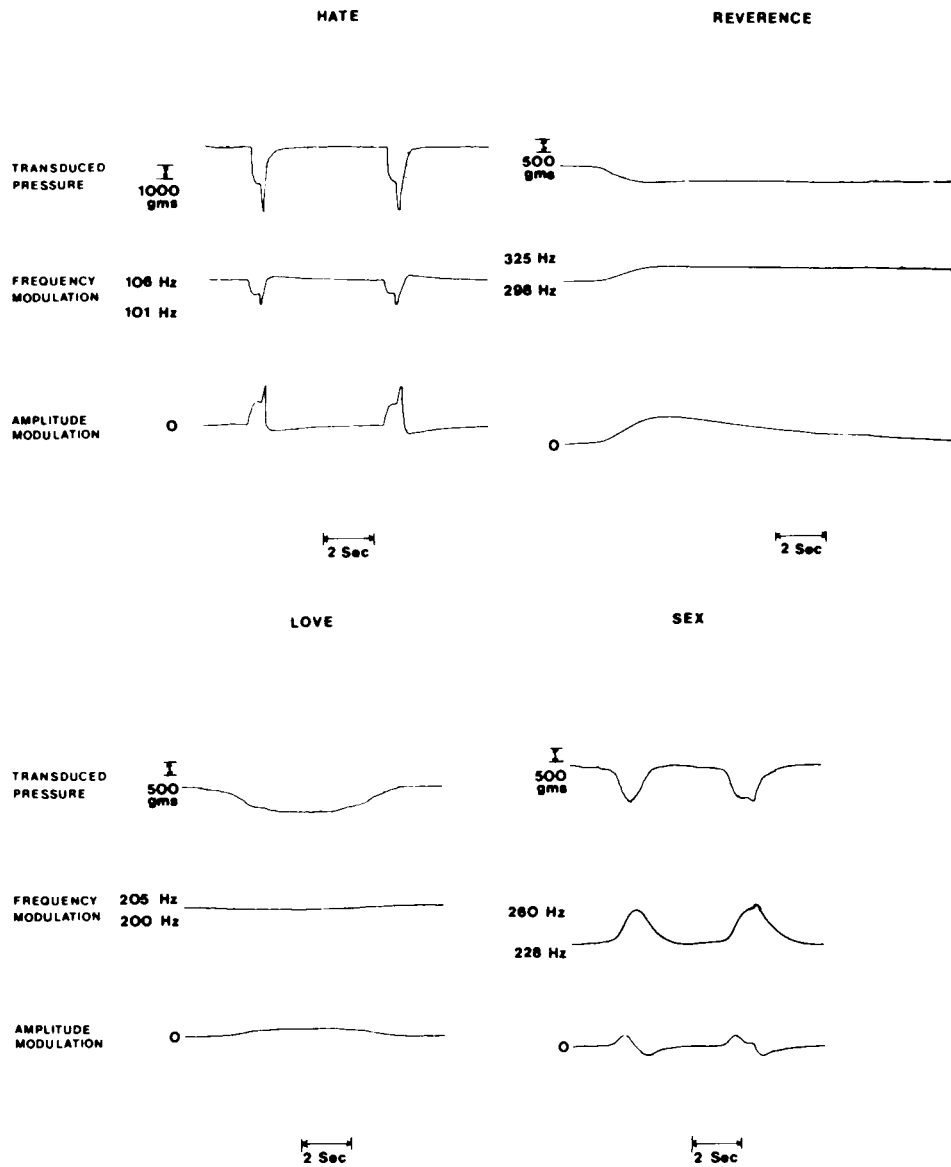
Table 1. Transforms of dynamic forms to sound forms of like expression, as amplitude and frequency modulated sinusoids (see Fig. 6): specific scaling parameters.

EMOTION	Sinusoidal base frequency Hz	FREQUENCY MODULATION Depth and Sign	AMPLITUDE MODULATION		
			Proportional	Diff. time constant $\tau$ (seconds)	A
ANGER	110	+ 59%	Prop.		
HATE	106	- 5%	Prop.	1.2	0.05
GRIEF	406	- 21%		3.1	1
LOVE	205	- 2.4%	Prop.		
SEX	228	+ 14%		1.0	
JOY	480	-, one octave: biphasic 20% down then 61% up	Prop.	0.32	0.20
REVERENCE	298	+ 9%		4.0	1

+ means : frequency  $\uparrow$  as pressure  $\uparrow$   
- means : frequency  $\uparrow$  as pressure  $\downarrow$

Differentiation time constant  
refers to transfer function  
 $\frac{A \tau s}{1 + \tau s}$  for ampl. mod. where  $s$  is  
the Laplace Transform.

PARAMETERS FOR TRANSFORMING  
TOUCH FORMS TO SOUND FORMS OF LIKE EXPRESSION



Figures 3 and 4 (next page). Examples of transformation of expressive forms of touch to sound that expresses the same feeling. The top trace shows expressive finger pressure (vertical component); the middle the frequency modulation envelope, and the lower trace the amplitude module envelope (time scale is doubled for Joy and Anger). The frequency envelope is the same as the pressure form apart from a vertical scale factor (except for Joy, where the wide dynamic range requires an approximately logarithmic scaling).

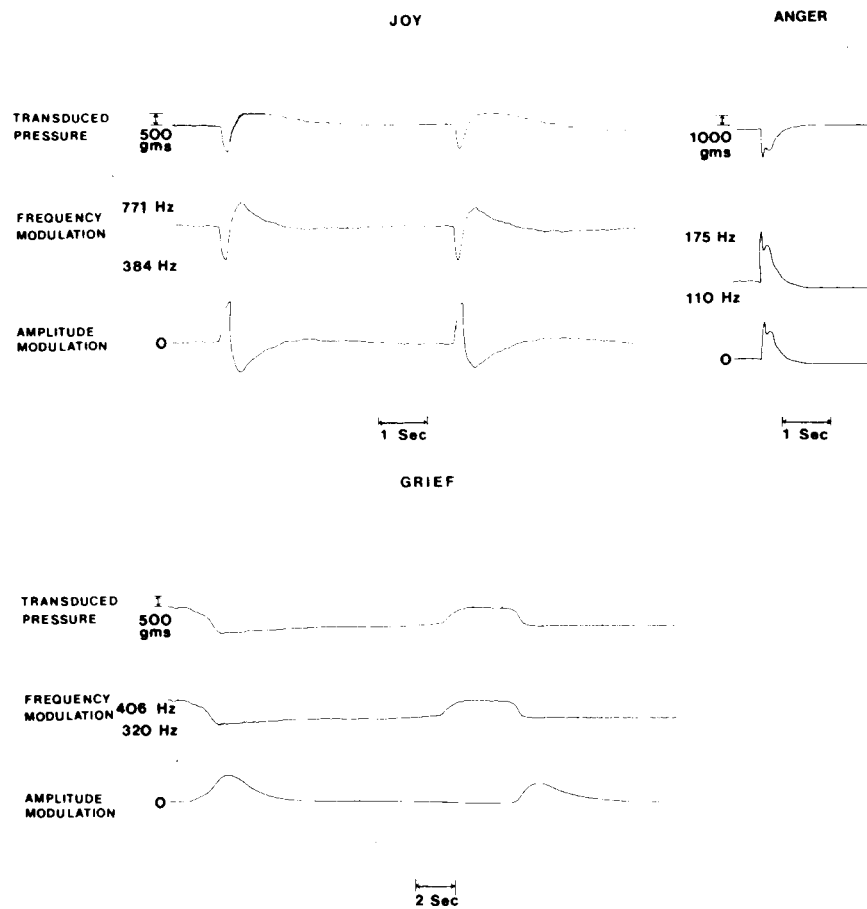


Figure 4. For caption, see previous page.

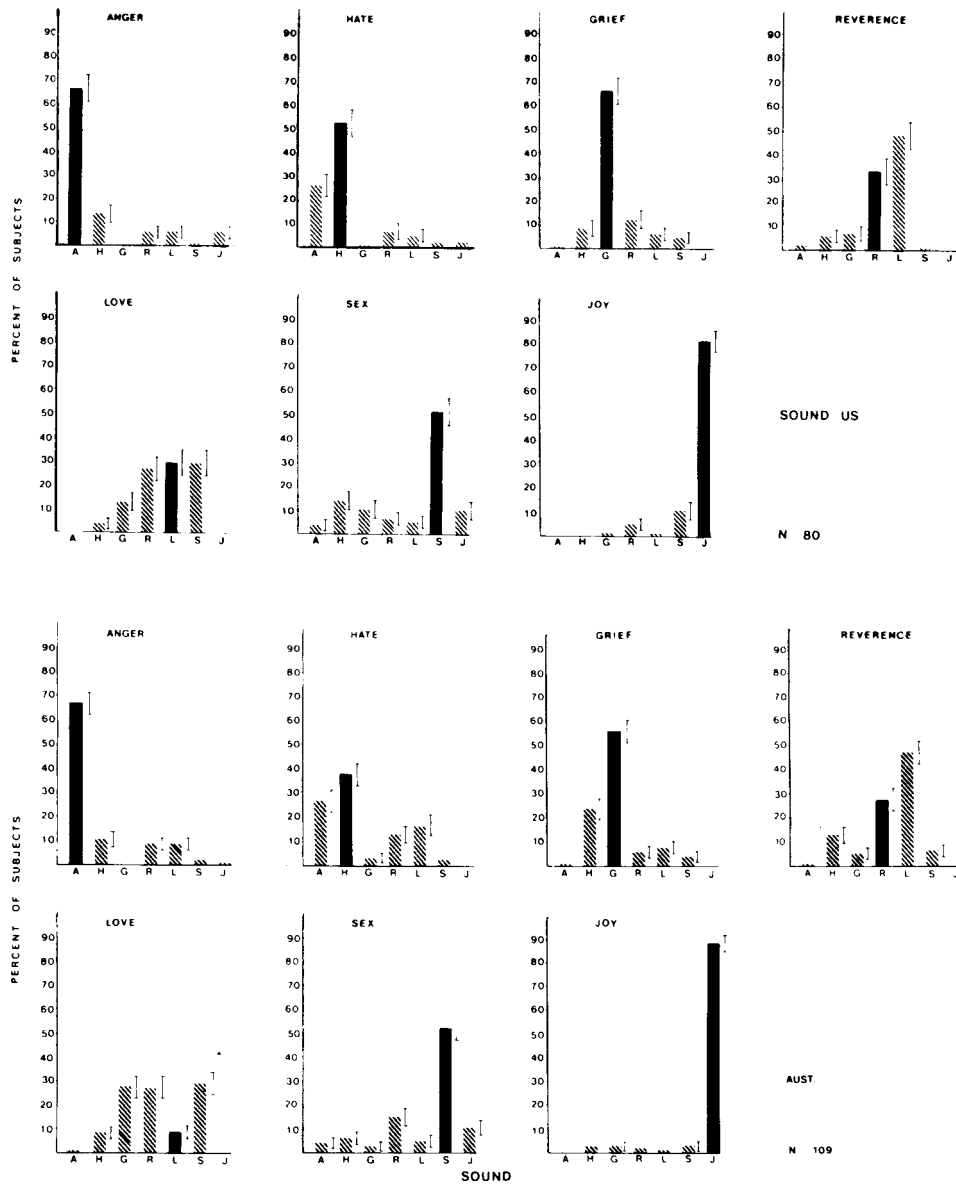


Figure 5. Recognition of sound expressions transformed from expressive touch. This figure shows that recognition of emotions was high for all emotions except for Love and Reverence which were largely confused with each other. A, H, G, R, L, S and J stand for the names of emotions. 'Correct' identification is shown in solid bars. Shaded bars show errors made. Standard deviations are drawn with each bar. Top group - students of M.I.T. and University of California, Berkeley. Bottom group - medical students of the University of New South Wales.

These emotionally expressive sounds, transformed from touch expressions were then tested on subjects for recognition using similar forced choice tests as in the visual recognition experiments. With a group of 80 university students from the University of California, Berkeley and another group of 109 medical students from the University of New South Wales recognition was excellent and highly significant as for the visual experiments, except for confusion between love and reverence (Fig.5). It was thus confirmed that the transforms worked: the sound expressed the same emotion as the touch expression from which it was derived (except for confusion between love and reverence). The next step was to test this cross-culturally.

### **Sound Expression transformed from White Urban Touch tested on Central Australian Aborigines**

To see whether the ability to recognise the emotional expression of the sounds transformed from touch was largely biological, or cultural, these sounds transformed from white urban touch were tested on a group of 40 Central Australian Aborigines of the Walbiri tribe, in Yuendumu, an Aboriginal settlement of about 800 persons located 200 miles north west of Alice Springs (Clynes and Nettheim,1982). 20 males and 20 females were tested, with the help of separate interpreters of the same sex most Aborigines spoke only little English. The names of the emotions were translated into the Walbiri language. Aborigines who live under abysmal, subhuman conditions on a “reserve” were highly attentive to the sounds and enjoyed the test - they listened intently, often with memorable expression on their faces.

Results for the Aboriginal subjects (Fig.6) showed very similar performance as the medical students and University of California students, and an even better recognition of joy (88% correct). However, in place of the confusion between love and reverence, there was a statistically significant switch between the two, so that love was significantly recognized as reverence and vice versa. (A possible reason for this was in the translation of the corresponding words.) Again males and females did equally well.

Recognition scores were similar for the other five emotions for both groups, even in terms of the kind of errors made. Clearly, these dynamic forms indeed were recognized cross-culturally. Moreover those sounds that were better realised in the judgement of one group were also judged to be better realised by other groups. That this occurred with sounds transformed from touch expression argues strongly for the primacy of essentic form as a brain program, over its specific realization in one sensory mode.

### **Application to Emotional Expression of Musical Themes**

In further experiments these emotionally expressive sounds transformed from touch expression were then converted to musical themes so that the pitch-time contour of the notes fitted the frequency curve. The amplitude relations of the notes were also adjusted to fit the transform. It could be predicted that any musical theme that conformed to these requirements would in fact express that particular emotion (many such themes are of course possible). These predictions (28 such melodies predicted to sound sad, Clynes & Nettheim,1982) were also confirmed - a phonograph record of examples of such sounds and musical themes is included in Clynes, 1982.

Further work with expression in music may be found in Clynes,1983,1984,1985, 1986b,1987. These studies describe discovery and consequences of two principles of unconscious musical thought (Pulse and Predictive Amplitude Shape microstructure) that add musical microstructure present in musical thought, but unnotatable, to the notated score, transforming the ‘dead’ notes of a score to living, expressive music.

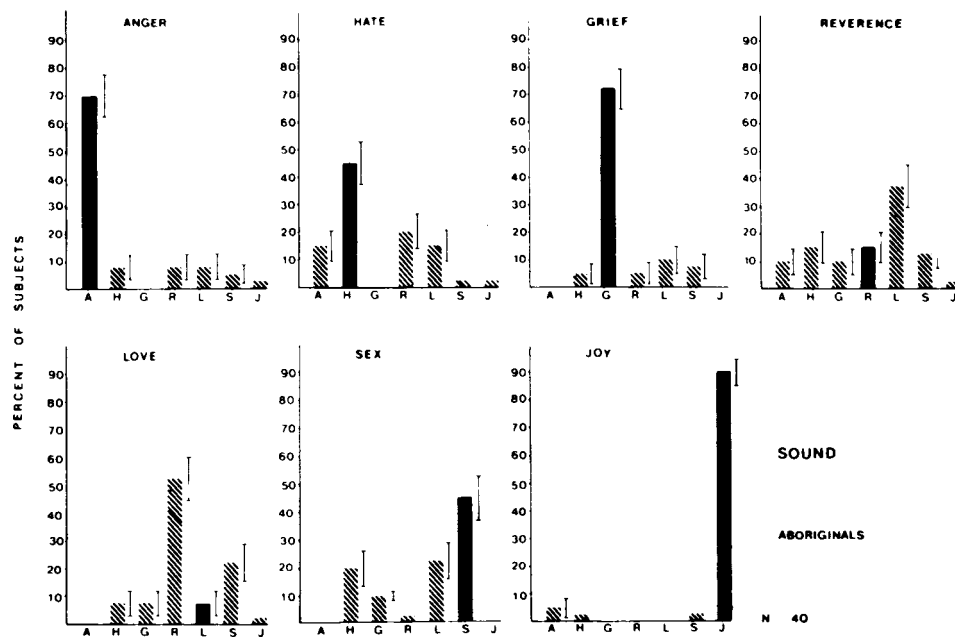


Figure 6. Recognition by a group of 40 Australian Aborigines, of the Walbiri Tribe in Central Australia, of sounds produced from white urban touch expression of finger pressure. Performance is very similar to the high recognition shown by the M.I.T. and Berkeley students, and by the medical students of the University of New South Wales. They did somewhat better than those groups in identifying Joy, Anger and Grief, although differences between groups were not statistically significant. Instead of confusing Reverence and Love they chose more clearly, but the choice was opposite of that intended: Love was chosen for Reverence, and vice versa. This may have been due to subtleties of translation. Differences between male and female scores were not significant in this group.

(The above citations, except for 1984 and 1986b, also include musical recordings.) Other relevant studies of brain functions concerned with timing and rhythm are described in Clynes 1986a, and Clynes & Walker, 1986, 1982.

In order to understand the relation of essentic form to music, and to the touch expression mode described here we need to clarify here that in music there are in general two parallel processes in time that contribute to its nature. One is the melodic line - the unfolding story of the music that develops as the music proceeds. The other is the 'beat' or 'pulse' which repeats throughout the piece, and has a character or microstructure that is largely maintained throughout the repetitions. The first one of these double processes portrays the emotional qualities of the 'story', their changes and contrasts, and in this process essentic form applies as outlined above to convey the various shades of emotion, using pitch time curves and amplitude contours. One function of the second process, the reiterated beat, can be said to be, in Western classical music, to identify intimately who is telling the story. In other music, the microstructure of the beat may reveal a type of group identity, eg. Hungarian, Spanish etc.

The parallel between the language of music and touch expressions of essentic form described occurs only with the first process - the unfolding of the musical story. The second music process, the phenomenon of the beat, has no parallel in the generation of emotion described here. That this method can generate emotion like music can but without a 'beat' constitutes a significant and basic difference, and has a number of advantages. (The need for a beat in music is linked to the use of separate 'notes'. These are given a grid in time on which



they are dispersed. If continuous forms of expressions rather than discontinuous notes are used, however, as in touch expression, this problem does not arise.)

### **The Amygdala as a Processor of Essentic Form**

There is a known structure in the brain which may relate to the primacy of essentic form over particular sensory modalities that our experiments indicate: the function of the amygdala as a “funnel-like gateway between cortical sensory areas and the deep subcortical nuclei responsible for the expression of emotions” (including the hypothalamus) (Aggleton & Mishkin, 1986). In their words “the behavioral and anatomical data reviewed make it evident that the amygdala is a main gateway for the evocation of emotion by stimuli in all the sensory modalities.” Further, direct electrical stimulation of the hypothalamus shows that, in cats, mechanisms of emotion are left intact after amygdectomy (Egger & Flynn, 1967, Fernandez de Molina & Hunsperger, 1962). Recent work shows also that after amygdal lesions in monkeys, the sound frequency trace of their separation distress cries becomes flattened, and loses its normal expressive contour. The amygdala may be regarded as a promising candidate for involvement in the key-lock processing of essentic form in the brain, before it is directed to stimulate the emotion, and also before it is expressed.

## **IV. Sentic Cycles**

### **Initial Discovery of their Function**

Measuring the essentic forms as described, the author was initially often subject for long hours at a time. It was repeatedly noted, after as much as seven hours of experiments, that instead of feeling tired the subject felt refreshed, energized. This good feeling, it soon became apparent, could not simply be due to the satisfaction of a good day's work, and also lasted longer. Clearly it seemed due to the process of repeatedly expressing and experiencing the emotions, and this has been confirmed by further work.

A second important factor observed was the ability to switch from one emotion to another - this was much easier than in life situations, and also invited comparison with performing music, where different movements of a sonata, for example, might require very different emotions to be summoned and expressed.

Thirdly, there was enjoyment in experiencing and expressing each emotion, regardless of whether these were positive or negative emotions - although some emotions were more enjoyable than others.

Even the most enjoyable emotions were not exempt from eventual satiation the satiation time tended to vary to an extent with different emotions. The human need for variety presented itself in terms of this type of brain function in a very specific manner (one can relate this to the satiation function of neurotransmitters and receptors). The process of recovery from satiation for each emotion also took a certain largely predictable time.

### **Design and Composition of the Cycle**

Using these observations, a cycle of emotions was constructed lasting about 27 minutes. The sentic cycle is a touch composition with a prescribed sequence and duration of emotions. Each emotion phase has a series of expressions, timed in accordance with that emotion. The time for beginning each touch expression is provided by a timing click. Usually a tape is used.

The sentic cycle tape announces each emotion by a word, and presents the series of soft timing clicks for that emotion, and then announces the next emotion followed by its series of clicks giving the beginning of each expression, and continues in this way through the whole cycle. It contains the following (for further details, see Appendix A):

	Duration of Phase	No. of Expressions
No emotion	2 min 6 sec.	23
Anger	3 min 13 sec.	34
Hate	2 min 33 sec.	27
Grief	4 min 19 sec.	31
Love	4 min 14 sec.	30
Sex	3 min 8 sec.	36
Joy	3 min 31 sec.	40
Reverence	2min 46 sec.	21

The timing of each click for starting an expression is adjusted to fit the natural duration of the expression for each emotion and additionally leave a small variable pause between successive expressions. As a consequence a user cannot predict when the next click would occur even after years of use. Each emotion phase is announced with a word, spoken with a slight degree of expressiveness. 'No emotion' is an initial period during which the user is asked to press on the finger rest with a simple action as when depressing a typewriter key each time they hear a click, without expressing emotion. (This preparatory stage quietens the body. It is then a simple transition in the next phase to express anger with a modification of this pressure-movement when hearing each click. For each emotion, of course, the dynamic form (time course) and intensity of the pressure is suitably modified by the user, according to his or her own feeling.)

### *Transition between emotions*

Special care needs to be taken in designing the timing of the clicks as one emotion phase ends and the next one begins. A short extra interval before the next emotion word is announced suffices to alert the subject that something new is about to happen. After the word is spoken special attention is required in designing the first timing clicks of the new series. In all this, as in music, either too much or too little seems to be irritating and counterproductive.

A second cycle, similar but with somewhat differently proportioned emotion phases was included in the early stages of our experience with sentic cycles. But as this increased the total duration to almost an hour, it was decided to discontinue it for frequent regular use. Although more powerful in its overall effect than a single cycle, it required more time than people could set aside over the longer term. Repeating the 27 minute cycle twice may not be as good as doing the original double cycle, because of its special modification. (A new digital electronic sentic cyler being introduced will make it possible for the user to select differently designed cycles and make modifications for special needs.)

An exact representation of the 27 minute sentic cycle is given in Appendix A.

### **Physical Setup for Executing Sentic Cycles**

A person sits on a hard backed chair without arm rests. A finger rest is mounted on a coffee table or other hard surface, of the same height as the seat of the chair. The middle finger of the dominant hand is used for expression, placed on the finger rest in a natural, relaxed

position. Expressive pressure is guided by the whole arm. Using the middle finger provides balance when pressure is exerted; otherwise there is a tendency of the arm to turn inward or outward. For some emotions the fourth finger may be adducted to the middle (third) finger for additional expressiveness, e.g. in grief, to provide a greater sense of collapse. Eyes closed and dim light are desirable.

The physical setup and position used is designed with a double purpose:

1.) To permit adequate generation of all the emotions required. Body position and posture may favour certain emotions and hinder others. Anger, for example, is not favoured in a lying down position. Sitting with the spine straight, a small cushion behind the upper back, a cushion on the seat, and thighs supported by the chair, provides a neutral position from which all the emotions can be well realised.

2.) This arrangement also results in the body, other than the expressing arm, becoming exceedingly quiet during the cycle. The quietness - one can almost call it a falling asleep of the rest of the body in a motor sense - allows one to focus on the quality of the emotion and on sensations in the body associated with it. This quietness provides a valued sense of inner freedom - an emotional freedom - and also helps one to be aware of the quality of the expression undistracted by other bodily events.

## **Finger Rest**

For sentographic measurement, the finger rest serves as a mechanical input to the Sentograph. But for doing sentic cycles for emotional well being, expressive forms are *not* as a rule measured - the finger rest here has the purpose of providing appropriately resistive support, a suitable surface on which to express and to avoid that it be touched by other fingers. (The finger rest in sentic cycles is not connected to anything - it does not measure anything.) It fulfils a number of requirements. To suitably accommodate all the emotions called for, the finger rest should have a very slight 'give'. It is quite remarkable how much difference in 'feel' a very slight give makes, even only a fraction of a millimeter. Without such a 'give', the communication is impeded. The finger tip is deformed an order of magnitude more than this when expressing, so that it is quite remarkable that such a small 'give' is sensed so clearly, and given such importance. It actually makes a considerable difference to the quality of touch expression. It would be worthwhile to study this phenomenon by itself.

Too much "give" is undesirable, on the other hand, especially for anger and hate where resistance provides satisfaction, and permits the exercise of force.

The texture of the finger rest surface is also significant. It should be neither too smooth nor too rough, since both of these attract continuing attention. A surface character that is, as it were, grey to the touch is required; one whose presence one rapidly forgets. With such a surface, one soon is little aware of it - as a musician and his instrument tend to become one in a good performance - and expression may

occur without obtrusiveness of the finger rest. Fig.7 shows a person doing sentic cycles.

## **Rating and Diary**

The user is encouraged, about half an hour after doing the cycles to:

1. Rate himself on a scale of 0 - 5 for the intensity of each emotion of the cycle.
2. To write comments concerning each emotion about what he experienced. Comments concern body sensations, images, thoughts, memories and may often be surprisingly eloquent and poetic.
3. Also, later, to write comments on the effects experienced afterwards.

The ratings and comments are useful to the subject, for both short term and long term and also have value for research purposes. Ratings and comments have been collected from over 1,000 subjects and statistically analyzed (Clynes, 1988). A summary of findings is given in Section V. Two typical rating and comments sheets are shown in Appendix B.

## **Art Form of Touch**

The practice of sentic cycles may thus be regarded as a simple art form of touch. The sequence and timing of the emotions and their expressions is given - this represents the composition. However, the emotions are not those of a composer, but those of the individual. Improvisatory and spontaneous expressiveness and thought is combined with a program, or metastructure.

The art consists of the discovery, by each person, of the most appropriate and effective dynamic form of the expression of that emotion, and sensing how that expression generates the emotion. Having found and sensed this, the person can apply it to other situations and modes, increasing the 'livingness' (to use Susan Langer's term) of their communication and experience, and become more authentic.

The art shows the individual how easily they can switch from one emotion to another, at will, and how such a sequence of emotions results in an overall impression greater than the sum of the parts. It impresses on the person how emotions are embedded in time, how time is part of the expression, communication and experience of emotion. And finally it teaches how we may "consider" emotion and its quality, without becoming totally involved bodily, so that its timeless aspects are also perceived, as an existential entity. In this (seemingly uniquely human) mode, called Apollonian, it becomes possible also to view the cognitive substrates K2 of each emotion and become aware of them free from the constraint experienced in every day life. This art, like other true art, can promote empathy and compassion.

## **Function of the Sentic Cycle, a Summary**

### **I . Effects of each cycle**

The sentic cycle engages the following functions:

1. Generating the emotions of the cycle.
2. Practically effortless switching of emotions.
3. Catharsis and release of repressed emotions.
4. Discloses which emotions may be problematic for the individual.
5. Draws memories to awareness relating to the emotion.
6. Stimulates fantasy.
7. Enjoyment of all the emotions of the cycle, with some specially favored.
8. Makes a person aware of the specific body sensations and changes that each emotion provides.

### **After doing the cycle:**

9. A sense of well being, peace, energy and centeredness lasting typically 10-24 hours.
10. Dissipates anxiety and nervousness.
11. Improves sleep.
12. More creative and spontaneous functioning

### **II. Continuing use for “normal” persons tends to:**

1. Even out the intensity of emotions experienced during the cycle: bringing out those that have been repressed and problematic, diminishing the intensity of those that were overly strong (typically, this tends to be noticeable with continuing use of 3-4 times a week, in 2-3 weeks).
2. Develops emotional fluidity - as opposed to being in an emotional rut, being stuck in one emotion.
3. Improves self esteem, confidence, joy of being alive, vitality, better communication with others, better control (2-3 weeks as above).
4. Gives feeling of security in being in touch with the range of human feelings, a sense of belonging and sharing - one becomes better able to give and receive. (2-5 weeks).
5. Gives insight into character structure (6 months + ).
6. Improved understanding and enjoyment of the arts and music.

### **III. For those suffering from emotional problems it tends to provide:**

1. Assistance for the remission of psychosomatic symptoms of emotional origin (Typical period for noticeable effectiveness 1-4 weeks).
2. The possibility of dealing with specific emotional problems such as phobias (1-2 months).
3. Help against insomnia without medication (1 week).
4. Help for dealing with moderate and light depression (1-3 weeks).

For these several cycles per day may be indicated, according to the severity of the condition.

Other helpful uses of sentic cycles have been as an adjunct to treatment for alcoholism, for combating drug dependence, for emotional core of cancer patients, and in a number of cases, for prevention of suicide.



Figure 7. A person doing sentic cycles, showing proper posture and position. A series of expressive forms for each emotion of the sequence, No Emotion, Anger, Hate, Grief, Love, Sex, Joy and Reverence, are expressed with the pressure of the finger and arm on the finger rest. Timing is guided by soft clicks at arrhythmic intervals of 4-10 seconds, depending on the emotion, from the sentic cycle tape played on a tape recorder. These indicate when to begin each expression. The sequence takes approximately 27 minutes.

## Functions of the Sentic Cycle

### 1. Generating Emotions

It is quite easy for most people to generate emotions in this way on their first try (about three out of four people), even though they have never done it before. This is reflected by their self-ratings and also by concomitant effects on facial expression, subtle changes in posture, flushing of the face and/or of the ears at different parts of the cycle, by crying during grief, a degree of sexual arousal during sex, and by modulation of respiration, changes in heart rate, and in finger temperature at the inactive hand which can be measured. About one in five

or six subjects, for example, cry during grief. Individuals are *not asked to maximize the intensity* of each emotion - merely to express as precisely as they can the quality of the emotion with each expression. One may observe that:

a) A person does not generate each emotion with the same intensity. In their first experience of the cycle individuals may have some difficulty with one or two of the emotions - reflected in their low intensity ratings. Which particular emotions these are, varies. Some individuals have difficulty with anger at first, some with joy, others with grief. Still others may have trouble with reverence, or hate, or with love. Rarest of all is the individual who has difficulty with sex in the cycle, be it male or female (this is unexpected). Difficulties with anger generally relate to individuals who have much repressed anger: People who are unusually timid may also have initial difficulty in expressing anger as it is uncommon for them to express anger overtly. Difficulties with hate are initially encountered with people who cannot differentiate between anger and hate, or those who say "I cannot feel hate for anybody", and those who on principle do not wish to feel hate. Repressed hate is, of course, also often encountered. Those who initially have difficulty with grief usually have severe repressed grief, sometimes going back to childhood. Rarely one finds a younger person who is genuinely untouched by grief, and who also is not appreciably affected by the grief of others, initially. Difficulties with love are initially encountered mostly among those who have not felt love for a long time (some of these have indeed included psychiatrists!). Those who have initial difficulty with joy often have lost their natural joie de vivre, are generally somewhat cynical, and may have subclinical, mild depression. Difficulties with reverence initially may be due to unfamiliarity with this feeling (meant not for a person), or, it often is due to an inner fury at the world, a cursing of existence.

b) Some people show unusually high intensity ratings for certain emotions at first. This may indicate an acute life situation relating to that emotion, but may also be an indication of character structure. High initial ratings are often found for anger, grief, love, joy, occasionally for hate and reverence. Sex is seldom given the highest ratings initially.

c) It appears also that here as elsewhere, people to some extent fall into categories of high raters, medium raters and low raters and to that extent their overall ratings might tend to be relatively high, or low, for all emotions, as a rating artifact.

d) Certain professions appear to facilitate initial ability to generate and experience emotions through the cycle. Musicians, actors, dancers, for example, find it especially easy; others such as engineers or accountants whose work does not provide as much emotional differentiation may find it somewhat less easy, initially. Categories of extrovert versus introvert, however, do not predict relative initial ease or difficulty.

e) Neither the initial ratings nor the quality of the sentic cycle experience appear on the whole to have any marked correlation with intelligence.

f) Obsessive - compulsive and hysterical personalities tend to be low raters and high raters, respectively, initially, for all emotions.

g) The sentic cycle experience and the rating system have not been adequately studied with psychotic individuals, and may not be suitable to them. Such studies could however be revealing and fruitful in a number of ways.

## Switching of Emotions

Even at their first try of the cycle, individuals have little difficulty switching emotions. The sequence is constructed so that the juxtaposition of consecutive emotions is not irritating, as alternating anger and joy would be, for example. Even those who experience intense emotions in the cycle rarely find that the previous emotion carries through to the following one for more than a few expressions. Ease of switching increases with use.

With strongly repressed emotions, however, (and with some acute life situations), it happens on occasion that the emotion first surfaces so strongly that it floods into the remaining parts of the cycle; this may happen with grief, and rarely, with anger. Crying may continue through part of the remainder of the cycle. On such rare occasions, one may wish to prolong the grief phase of the cycle, before continuing with the rest of the cycle. In such instances the outpouring of emotion is felt as a relief, as a fulfilment, and has not led to uncontrollable, or destructive action in any instance. (These individuals do not include psychotics, about whom data are not available.)

Such strong and long repressed emotion is generally less in evidence at the next cycle, done on the following day, and after another two or three cycles settles down to be hardly more prominent than the other emotions, and does not impede switching from one emotion to another.

Achieving emotional fluidity over a period of time liberates persons from being in an emotional “rut” of being stuck in one emotion, as often occurs in their lives.

Interestingly, switching from “sex” - involving a degree of sexual arousal - to joy and then to reverence does not bring a sense of frustration, in spite of being an incomplete sexual experience. This contradicts a widely held notion concerning sexual functioning. Nor is there any evidence that “sublimation” is involved in the switching from sex to another emotion. The following emotion is enjoyed, but would have been enjoyed also, had sex not immediately preceded it.

This aspect, and switching are significant and of theoretical interest especially also when couples do sentic cycles together, expressing emotions on each other’s hands, a valuable mode, not described further here.

## **2. Cathartic and Selective Memory Aspects of the Cycle**

Going through the emotions of the cycle can be a cathartic experience. It offers an opportunity to express negative emotions without fear of punishment or rejection. Catharsis works directly in relation to current life situations. But the generalized emotions have the special and remarkable property of selective recall: past experiences of similar emotion are readily and spontaneously recalled, while during one emotion memories of a different emotion tend not to be recalled spontaneously. This is one of the interesting properties of the K2 substrate function of the emotion (see also Bower, 1981, Gilligan & Bower, 1984, Isen et al., 1978, Laird et al, 1982, for similar findings). Further, certain past experiences of that emotion are readily recalled, others less readily, still other instances only with difficulty or not at all, at first. Repression is not necessarily an all or nothing phenomenon: one readily learns in these studies that there are degrees of it. Generating emotions through the sentic cycle serves as an access path to memory. During each emotion phase memories relating to that emotion may spontaneously arise. They can be written down after the cycle and become part of the emotion and rating diary.

A gradual weakening of the operation of Freudian ‘censors’ involved in repression of certain specific memories and feelings may be observed as the individual explores past life situations with this means.

We may view cathartic experience broadly, with conscious and unconscious aspects involving both negative and positive emotions. The expression of positive emotions (which we find can also be repressed, a condition not usually comprised under the concept of catharsis), gives the individual assurance that he or she is capable of these emotions, and that their enjoyment is available to them. (A surprising number of individuals note that they have not experienced love and/or joy for a long time and are greatly relieved to be able to feel these again; sometimes moved to tears by this.)



Sentic cycle experience can be viewed as dis-alienating, as a factor in reintegrating and rejoining the fragmented emotional sphere of the individual, resulting also in greater spontaneity. (Increase in spontaneity is sometimes dramatically evident after the very first experience of the cycles as blockages disappear).

An additional K2 property became evident in the course of teaching this to a group of psychoanalysts at the William Allinson White Institute in New York. Analysts who had their patients do sentic cycles found that they reported dreams about three times as frequently as before - patients remembered their dreams much better. It is well known among psychoanalysts that after starting analysis a client will tend to remember dreams more readily than he had customarily. The sentic cycle experience thus seems to open that path of communication further.

The greater power of sentic cycles as an “emotional lens” than music is due to its ability to focus on one emotion for 3-4 minutes at a time, freed from a composer’s personality, idiosyncrasies and story telling. While sentic cycles may be viewed as an artform of touch, its therapeutic and integrating functions maybe greater and more accessible due to the absence of intellectual construction present in most art forms. Intellectual construction, interesting and valuable though it is, can circumscribe the direct applicability to the individual’s own life. Often it is a barrier and a filter which needs to be surmounted by knowledgeable understanding of the art work. For that reason the catharsis of art experience for a perceiver of art is not easily applied to analysis of character structure, treatment of phobias and personality disorders. The situation is different when creating works of art or poems, or music, where the content and structure more or less directly express thought and feelings of the creator. Compared to this, sentic cycles is direct, with a minimum of symbolic structure. It allows creativity in each expression. A clear link is formed between expressive activity of a person outside their own life-line, and their personal life - a link they can explore themselves, moreover, without necessarily having professional assistance.

For the same reasons, emotion generated through this means, being unencumbered by symbolism and incidental structure, may be a method of choice for studying the nature of K2, the output cognition substrate of a particular emotion.

### **3. Generating Play of New Fantasies**

Individuals doing sentic cycles can and do generate emotion without imagined scenes, either remembered, or newly fantasized. They can choose, however, to “play” with memories, or with new fantasies related to the emotion. This freedom, combined with control, gives the sentic cycle experience a play-like, an almost dream-like quality, where new fantasies effortlessly stay guided within the context of the particular emotion - and remain so until a new emotion is called for, with an announced word.

The freedom of association within the context of the quality of the emotion permits the individual also to actually conduct Gedanken-Experiments with his own psyche. For example, when experiencing love, or anger, he or she may deliberately imagine specific other individuals and note to what extent the emotion ‘fits’ with the imagined person, as a recipient, or even as a sender. (This process is quite different from word association, or free association, and to some extent resembles guided imagery.) In this way they may sometimes surprise themselves at finding that they can or cannot associate that feeling towards the fantasized person. This kind of testing of relationships can be helpful and revealing, and often gives quite a different view than what they would have offhandedly thought. It can be used to probe how the person relates to mother and father, and other long term relationships. Surprisingly, it is easy to separate recent events giving rise to emotion in relation to the imagined individual from a

more basic, long term, emotional attitude towards that person.

Such relationship and reality testing with emotion- focused fantasy processes are used in particular therapeutic applications to be described in a later section.

#### 4. Bodily Sensations Experienced During the Cycle

As a person experiences the sentic cycles he has an unusual opportunity to sense bodily effects of each emotion. He sits quietly, and yet has ongoing activity involving motor output. These sensations experienced appear to be part of the total gestalt of the emotion - they cannot be separated from the emotion, although they may often not be noticed as clearly and readily in real life situations, being masked by other ongoing movements and sensations. These sensations are not to be confused with the usually measured autonomic changes such as of heart rate, blood pressure and finger temperature, which are less specific, and not clearly (or not at all) sensed. They tend to continue throughout the emotion phase - they are not separately produced only with each expression. Virtually all individuals experiencing the emotions of the cycle describe such bodily sensations:

1. *Anger*: clenching of the jaws (moderate), abdominal tension, fixation of the eyes (even with eyes closed), gaze slightly (or 10%) downward from horizontal, breathing in jabs, tendency to lean forward slightly, sense of temporary forcefulness (e.g. territorial defense).

2. *Hate*: abdominal tension - lower than in anger, involving anal regions also, clenching of jaws, resistive breathing in exhalation. Sense of continuing purposefulness, force.

3. *Grief*: sensation of heaviness - arm feels heavy, limbs feel heavy, great sense of effort to move, helplessness, breathing tends to stop after exhalation for moments before next inspiration, breathing pattern like a series of sighs, head tends to bow to one side (usually the side of the expressive arm), gaze downward, shoulder and torso tends to bend forward. Abdomen relaxed, but chest constricted. Eyelids heavy. Little energy, weakness, hopelessness, isolation.

4. *Love*: head level, mouth opened slightly, no clenching of teeth, breathing even and rounded, eyes in soft focus, gaze forward, abdomen relaxed, chest free, sense of quiet strength, contained energy, sending of flow: sensation of flow going outward from torso through limbs, eyes and forehead, a reduced sense of effort, a sense of contact, slight smile.

5. *Sex*: A degree of sexual arousal and excitement, sensations in the genital areas, and breasts in women, desire, breathing unfree, with some expiration resistance, a diffuse sense of tension, desire for contact, to touch and be touched.

6. *Joy*: sense of lightness of limbs, bouncy energy, torso upright, head slightly upward, eyes "dancing", soft focus, sense of freedom, carefree, effortless, undirected energy, breathing gasps of inhalation, smile, abdomen relaxed, chest free and expandable.

7. *Reverence*: sense of expansiveness, of vague or insubstantial body limits, deep slow respiration, head lifted upward slightly, gaze slightly upward, steady, soft focus, no smile, effortlessness, unweightedness (but not bouncy) \*, a sense of being a vessel, a receiver of flow.

These are of course only partial descriptions.

A further interesting aspect is that expressing with the right or left hand appears to be differentially effective - certain emotions are more favored with one hand, both with regard to generation and memory recall (cf. Davidson, 1984). This links with indications of hemispherical localization of emotion observed in evoked potentials with expression, using finger pressure (Clynes 1975, 1973). However, interestingly, the body sensations experienced for the various emotions all tend to be symmetrical.

(During the cycle, a smoker does not seem to desire to smoke, nor does a person wish to eat, drink, and it seems one tends to feel less cold than one would otherwise be.)

## Effects After Sentic Cycles

After finishing the last emotion, a person sits quietly for a minute or so before getting up and resuming activities. For the next 15 minutes or so there may be little desire to talk, but rather a wish to let the experience sink in, to allow it to transfer to long term memory. A sense of calm and completeness is generally present. This may merge gradually into a feeling of well being, of centeredness, of effectiveness in whatever one may be doing. There is flow, lack of hesitation or of conflict. Correspondingly, there is a marked diminution of anxiety, or none at all. There seems often to be more time to do the things one has to do, as well as much less anxiety about getting them done. Even unpleasant chores tend to lose much of their unpleasantness, and there is a sustained sense of quiet energy.

These effects tend to last for a number of hours, up to 24 hours.

If an individual experiences the emotions very intensely he or she may feel drained afterward, but this tends to be the exception rather than the norm, and is rectified as cycles are repeated on other occasions.

If the cycle is done before going to sleep or within an hour or two of going to sleep it tends to improve the quality of sleep - if a person has a sleep deficit, it will tend to make that person sleepy; and will also promote yawning after the cycle in such instances.

## V. Results of Sentic Cycle Ratings and Observations

The following reports on some of the data obtained from the scoring of each emotion phase for intensity (0 - 5), and from written comments concerning each emotion phase and after-effects of sentic cycles, from a sample of 1142 records collected over a ten year period, on sentic cycle diary and rating forms. Subjects were United States and Australian adults, 18-76 years old. The cycles were done by the subjects at home, or in groups supervised by the author.

For some subjects, the scoring and reports available comprise several hundred sentic cycle experiences, over several years, for others, 5-20 sentic cycles, and for most subjects 2-5 sentic cycles.

### Intensity

Ratings for intensity were self scored, within 30 minutes of completion of the cycle, on a scale of 0 - 5 (0 no effect, 5 maximal intensity). Among U.S. subjects, mean ratings for the seven emotions were in the range of 2.6 to 3.2. Fig. 8 shows male and female mean ratings in the U.S. and for Australian subjects. Fig. 9 separately compares the females and males of U.S. and Australian subjects. These results show that:

1. Overall, love achieved the highest mean score, next came joy, then sex and grief, anger, reverence and hate lowest, though the values were all in the medium range of intensity. (In this analysis a subject's score is taken as his/her average for the number of cycles done). The conclusion that people tend to experience the emotions with medium intensity under these conditions needs to be tempered by the well known tendency for people to score toward the middle of a presented range. It is interesting and unexpected however that overall, love tended to have the highest score, though not by a great margin.

(\* Recent experiments in our laboratory indicate that feeling reverence can reduce sensations of effort in muscular exertion and can temporarily increase physical strength up to 20%. How these and other effects are mediated neurochemically and neurophysiologically is a challenging question to explore.)

2. U.S. men and U.S. women scored very similarly for most emotions, but U.S. men scored significantly somewhat higher for anger and hate than women ( $p < .001$ ). We could consider that these differences indicate somewhat greater open aggressiveness among men than women in the U.S., but the difference in means is relatively slight, about 0.4 of a rating point.

3. Australian women scored strikingly similarly to U.S. women, except that they scored significantly lower for hate and somewhat higher for grief ( $p < .01$ ) than US women. This difference may well relate to sociologic conditions: Australian women are not as emancipated as American women - there is probably a lag of about 30 years in the social effectiveness of the feminist movement, compared with the U.S. Among Australian women perhaps grief has not turned into hate as it often may have for U.S. women; this would be consistent with greater acceptance of repression by Australian women.

4. Australian men scored significantly lower for all emotions than Australian women ( $p < .001$ ), except for sex.

5. Australian men scored significantly lower than American men for all emotions ( $p < .0001$ ). A remarkable result indeed! This seems to reflect to an extent the prevalent Australian mores and an education system which still considers it unmanly to show emotion, except at football games or races.

6. Variances in the score were in the range of 1.2 - 1.6, and showed largely similar variability for all emotions.

In depicting the relative intensity of the emotions experienced in the sentic cycle, sentic cycle experience data, it can be seen, may also yield socially significant results.

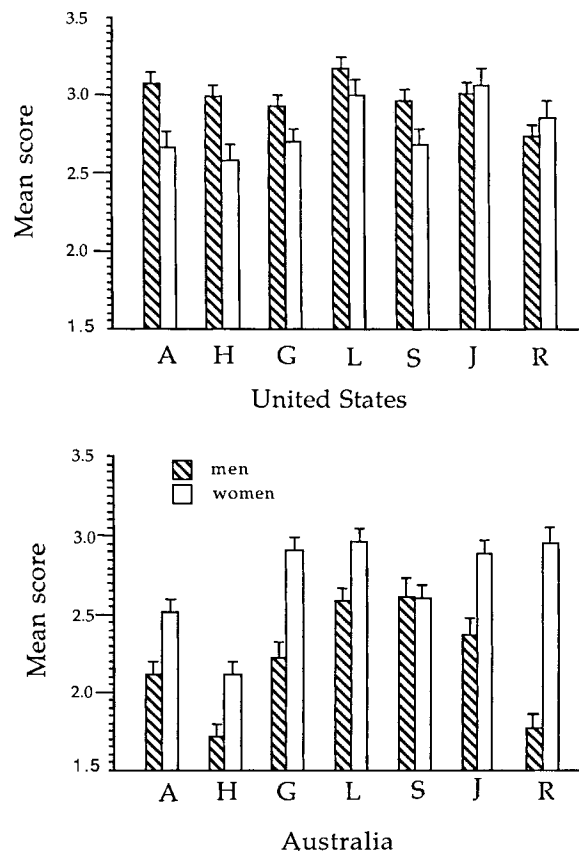


Figure 8. A comparison of mean scores of emotion intensity for United States and Australian subjects for each emotion phase of the sentic cycle. Intensity is rated on a scale from 0 to 5. Standard errors of the mean are shown also ( $n=216$ ).

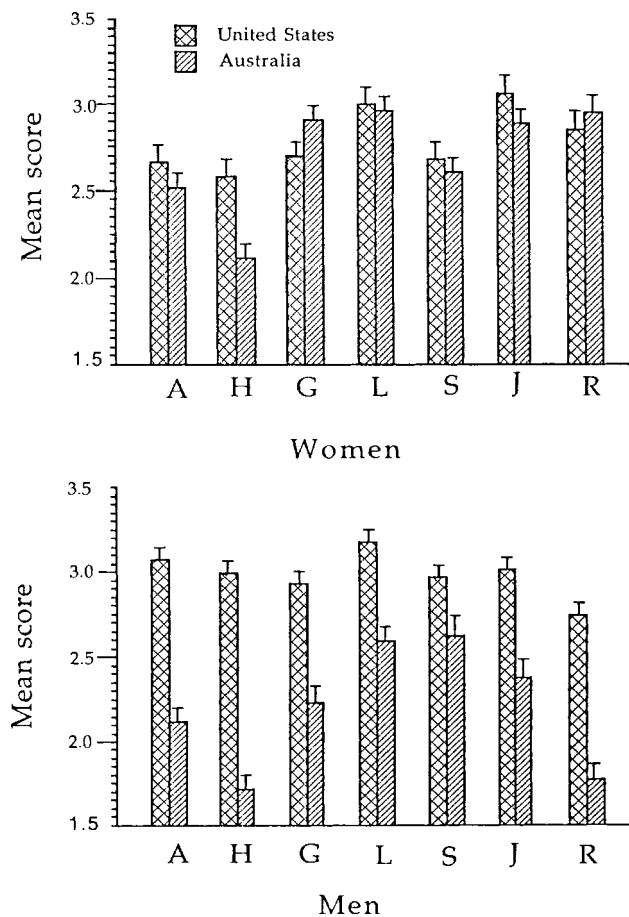


Figure 9. A comparison of mean scores of emotion intensity for men and women for each phase of the sentic cycle. Australian men score notably lower than Australian women.

### Intensity Changes with Successive Sentic Cycles

Fig. 10 illustrates how the intensity of the emotions averaged across subjects changes with several experiences of the cycle. The various emotions show clearly different progressive courses. Two sets of data are superimposed, one set for a group who have completed four cycles, another for a group who completed five cycles. The two groups show largely overlapping results confirming the reliability of the progressive trends observed. Notable is:

1. A gradual decrease in Anger
2. An increase in Hate, at least for the first 4 cycles
3. A considerable increase in Grief, followed by an apparent attenuation
4. A comparatively steady Love score
5. Increase in Sex scores for the first 4 cycles
6. Gradual increases in Reverence
7. A slight and gradual increase in the mean for all emotions, for the first 4 cycles.

It is striking how anger is gradually reduced, sex gradually build up, and how grief is increasingly tapped and then released over a number of cycles, in a biphasic curve, reaching

greatest intensity at the third cycle.

By the fourth cycle, all emotions are scored higher than at the beginning, except anger which is reduced considerably. These increases observed for the first few cycles do not of course continue unabated as more cycles are done; rather they tend to settle at an enjoyable, comfortable level, and fluctuate around that level - a level that varies for different individuals.

Fig. 11 shows changes in the rank order for the intensities of the various emotions as progressively more cycles are done (for the 5 cycle group). Notably, love retains its rank throughout. The prominence of grief and anger are decreased, while that of joy, sex and reverence increases.

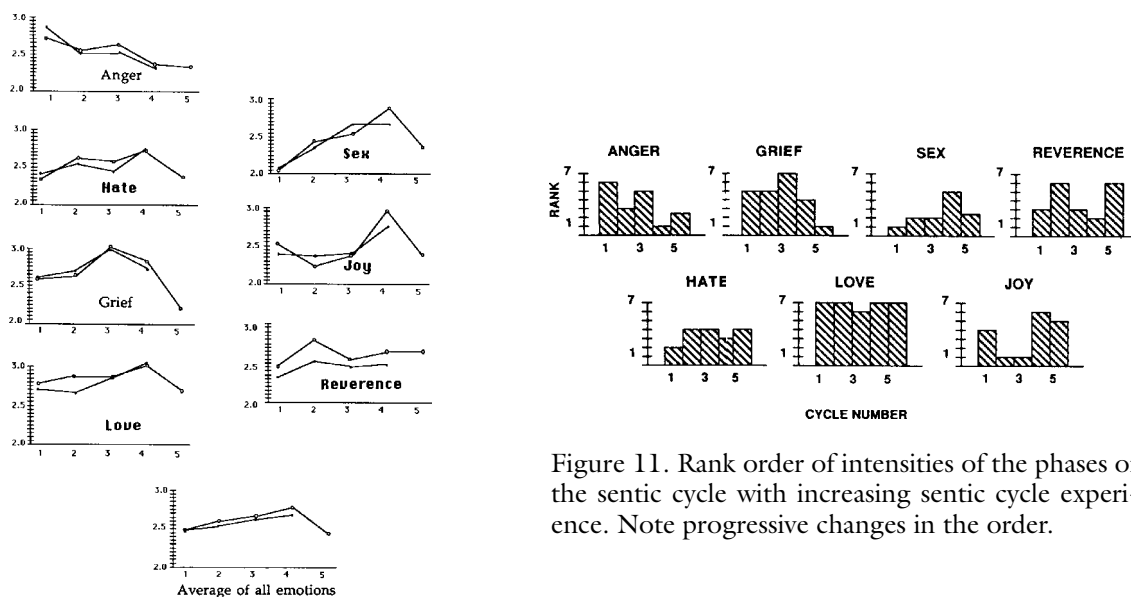


Figure 11. Rank order of intensities of the phases of the sentic cycle with increasing sentic cycle experience. Note progressive changes in the order.

Figure 10. Progressive mean scores for each phase of the sentic cycle showing changes in the scores from the first to the fourth and fifth cycle. Results from two groups are separately drawn, one group who have completed five cycles ( $n = 24$ ), the other group four cycles ( $n = 41$ ). Results of the two groups are largely similar and show specific progressive patterns for each emotion discussed in the text. Horizontal axis gives the cycle number.

## Diurnal Cycle and Intensity Scores

If intensity scores are analysed, in preliminary work, according to two time zones, morning and evening zones (up to midday, and from midday to midnight), significant differences found are: somewhat higher scores for grief, reverence and for sex (surprisingly) in the morning, but a higher score for hate in the evening and afternoon zone - the other emotions show no significant change - which is also interesting. It is theoretically important in terms of circadian neurochemical regulation of peptides and of receptor sensitivity, that we do not see a general diurnal change in intensity affecting all emotions across the board but instead select differences pertaining to specific emotions .

## How some After-Effect Comments relate to Scores

The written comments concerning after effects of sentic cycles were not structured - no specific questions were asked, and comments were made spontaneously, in a manner chosen

by the user.

These comments were searched according to a number of categories. Did they specifically mention increased (or decreased) a) calmness, b) sense of well-being, c) energy?

When the scores corresponding to the instances where special mention was made of calmness, sense of well-being, or energy were analyzed, a significantly lower level of hate (calmness and well-being), and a higher level of reverence (wellbeing and energy) was noted with a high level of the 'mentioned' categories. Other emotions were not significantly different. Table 2 shows these effects, and also shows differences in the scores when subjects cried during the grief phase and when they experienced physical discomfort.

Crying during the cycle goes together with a higher score of grief, not surprisingly (mean value of 3.83 compared to 3.01,  $p < .005$ ). But notably, for none of the other emotions is the mean score significantly different for those who cried during grief. This tends to show that grief was not carried over to alter the intensity of other emotions systematically.

Table 2. Phases of the sentic cycle with significantly increased or decreased mean intensity when comments on the after-effects of the cycle included the descriptors shown.

		A	H	G	L	S	J	R
After cycle	Calm		↓					
	Well being		↓					↑
	Energy							↑
	Low energy						↓	↓
During cycle	Crying			↑				
	Physical discomfort			↓	↓	↓	↓	↓

Physical discomfort experienced by some subjects due to incorrect sitting positions (such as wrong height or position of the finger rest (sore arm), or wrong height of the chair (unsupported thighs (tall people), or no cushions as instructed), resulted in all scores after hate being significantly lower. It is interesting that anger and hate were not scored lower. This could be because discomfort takes a while to be felt - anger and hate are the first two emotions of the cycle - or it could be that discomfort itself is quite consonant with anger and hate, and may help to promote them, or a combination of these two factors.

Notably, a high score of reverence accompanies after-effect comments of a high degree of well-being, of high energy. Lower hate scores accompany after-effect comments that emphasize calmness, and well-being. These findings recall our previous observations that hate and hope tend to be opposites rather than hate and love ( Clynes, 1977), here juxtaposing hate and reverence as having opposing influence. It may be pointed out, parenthetically, that those with a strong resentment or hate for existence, encountered often among people subject to great injustice or affliction, often have corresponding difficulty in feeling reverence, and derive special benefit from rediscovering this ability through sentic cycles.

## VI. Cognitive Aspects of Generalized Emotion

We may consider specific cognitive effects of generalized emotion on:

1. memory
  - a) as a retrieval lens
  - b) on the ability to learn, involving both short term and long term memory, and combinatorial thought
2. perceptual processes
  - a) narrowing or widening of perceptive fields
  - b) perceptual alteration and distortion
3. relationships with those not responsible for its generation
  - a) how we regard others
  - b) to whom the emotion may be directed and from whom received
  - c) how we view ourselves and the world

These effects seem in general not to depend on how the emotions have been stimulated, i.e. they may be independent of K1, and may be thought largely to be K2 functions.

Let us consider each of the emotions of the cycle in turn, and describe some of the effects that have become evident through cumulative reported sentic cycle experience. Some of these qualities seem to agree with common knowledge, others have been expressed by poets, and still others appear to be new insights.

*Anger* - has a narrowing effect on perception, span of attention, reduces the ability to learn (as noted in unpublished experiments with number sequences presented during the sentic cycle), larger relationships are not readily noted. Anger is readily directed towards any person or object available for its expression (cf. the common phrase “taking it out on someone else”). Concentrates attention on some object of anger at the expense of other competing perceptions. (An important difference between anger and hate may be noted when one realizes that one can be angry at a child, say, without hating the child. A pure anger is strong without being nasty, generally involves an aspect of protection, and can be beautiful.) A significant parallel can be pointed out between the narrowed cognitive focus, and the body condition of abdominal tension described for anger under the Section IV, which feels like a narrow internal body-focus. (Similar parallels may be drawn for other emotions.)

*Hate* - an inner closing off, a sense of a continuing injustice and threat that needs to be removed or avenged (protective measures are no longer sufficient), suspiciousness of anything new, distrust, especially of anything beautiful, a sense of having been essentially violated, a “logical” thought that only destruction is the proper end that will give relief. No restriction by conscience from doing immoral acts in order to satisfy the imperative of the hate, as cognitively the destruction is seen as justifiable. Hate is not quite as easily directly transferable as anger, but when it is, is all the more deadly, and tends to become pathological.

In depressive states in which joy cannot be experienced, a hate of existence is often felt, perhaps conceptualized as hate of God, sometimes even leading to suicidal impulses. (When such a person rediscovers the ability to feel joy through sentic cycles, both depression and hate are reduced or disappear. A factor that may also stimulate such hate, in a circular fashion, is the inability to feel joy in itself.)

Understanding these functions of hate through the sentic cycle also diminishes its power and hold over the individual - the idea is not to teach people to hate, but to understand what it feels like to hate, so that they can recognize it in themselves and understand it in others.

*Grief* - This appears to affect short-term memory negatively, resulting in part probably from diminished interest (interest enhances memory retention). Somber, dark colors, greys appear consonant with grief, and this appears to be not merely a social convention. A sense of



isolation is experienced, and stimuli from other individuals and the environment are not processed cognitively with the usual interest. An irretrievable loss has occurred, and hopelessness makes every action effortful, contributing to helplessness. Crying provides a measure of relief from the isolation. This remarkable cognitive function of crying is not well understood and needs to be studied. (cf. also Separation Distress Vocalization in animals; both crying and SDV are 'help' signals to others (mother) indicating distress. That this is not a simple problem is clear from the facts that the cognitive relief of crying is present when one knows that no one can hear it, and indeed that for human adults, frequently the best way of helping a person who cries is to let them cry.

*Love* - With love (not in phases of 'being in love'!) we tend to observe a wide attention span, improved memory retention, trust, a widening of interest and improved learning, perception of larger interrelations, a sense of inner freedom combined with responsibility, of giving. Seemingly also increased appreciation of beauty, colors of nature, and other perceptual qualities. But unlike for reverence,

individual details (and details of individuals) retain their interest. (Further cognitive aspects of love are given in the following section.)

*Sex* - Among the most unresearched but important 'facts of life' are the cognitive transformation of view, and the changes in cognitive function after orgasm as compared to before (to an extent different for men and women), and the neuropeptide and neurohormonal changes that appear to be involved in these. While sentic cycles experience does not tell us about this either since orgasm is not involved (except, quite rarely, in women) it gives us valuable pointers along the way. Cognitively, sexual arousal greatly narrows the focus of perceptual awareness, as sexual feelings 'take over'. Non-sexual environmental stimuli tend to be ignored, while sexually stimulating sounds and images become more potent. (After orgasm, the reverse occurs for a period of time.)

Memory retrieval functions during sexual arousal are highly selective. But the effect of and need for fantasy, of newly imagined scenes may be greater (though not indispensable) for sex than for the other emotions in the cycle. Sexual arousal appears to clearly interfere with learning; not surprisingly.

Another significant cognitive aspect is the degree of attachment that develops as a result of sexual intimacy, a sort of 'imprinting', which varies a great deal depending on the experience and character structure of the persons concerned. This may sometimes lead to power plays. A further cognitive aspect is that some individuals put an unusually great value on sexual intimacy and require or barter other values to be exchanged in relation to it. This, however, conflicts with the aspect that sex tends to be valued far more when it is not available than when it is. As a result serious problems, conflicts, and instabilities arise. (Such potential (systems) conflicts can be explored in the sentic cycle, and related to other emotions.) Sense of power appears to be a cognitive substrate of sex, but it remains to be clarified to what degree this is innate, and to what extent a distortion of natural function, associated with individual character structure and particular culture (cf. also animal dominance patterns in relation to sexual behavior).\*

The main cognitive effect remains an attraction, which may lead to a merging of two individuals in which their separateness is partially drowned - and thereby to the procreation of the species.

\*This potentiating property of the sexual drive, and its companion, frustration, may well be invoked by advocates of the theory of sublimation advanced by Freud. A different kind of potentiation is observed however, for example, in relation to reverence, one that biochemically and neurohormonally seems not to be deactivated at the times when the sexual potentiation is. The consensus of reported sentic cycle experience accords the sexual drive major importance, and recognizes it also as a hidden (unconscious) factor in much hostility, but does not support the concept that it is the only basically effective 'drive'.

*Joy* - care falls away - unburdened, there is sharing and generosity, celebration, exaltation, no hard focusing of attention, some deactivation of memory and of combinatorial thought. As described in Schiller's Ode to Joy, a sense of brotherhood is a cognitive consequence of joy. Joy is a natural 'high'; we may note parenthetically that the actions on particular endorphins and neurohormones of various drugs producing "euphoria" in some ways may appear to mimic the natural process of joy, including some of the cognitive substrates.

*Reverence* - infuses a sense of wonder and gratitude to be alive. Triviality in effect vanishes and cannot distract - instead, details, such as ambient sounds and noises, are not as usually tried to be suppressed, but perceived as part of existence, without irritation. The perceptive fields are widened, but interest is quite changed: nothing seems to attract interest merely in itself, only as part of a larger whole. Effort tends to disappear. Rather, there is a sense of receiving and of participation in the larger creative process - paradoxically it makes a person feel both insignificant and secure, and also strong in a way that, unsought, becomes an antidote to depression.

(Ironically, the old notion of religion as the opiate of the people has literally turned itself inside out now as a way to produce endogenous opiates in the brain that appear to be able to lead to greater wisdom, meaning, and satisfaction in life.)

These cognitive functions of reverence, also to be found especially in the late works of Beethoven, seem not to depend on specific personifications, dogma and imagery associated with various religious practices, which in fact largely may be seem to function to cultivate the feelings of reverence.

### **Experiment on Cognitive Substrates of Emotion: Even an Insignificant Lie Blocks Love but not Anger**

We shall now give an example of experimental studies of the cognitive substrates of specific emotions that have become possible with our method. This particular study addresses the question of an inherent connection between love and truthfulness, and in a larger sense, trust. It shows that even an insignificant, trivial lie temporarily blocks the emotion of love, but not of anger, and demonstrates strikingly that love is incompatible with lying (Clynes, Jurisevic, and Rynn, 1988).

We designed the study to test the effect of a small, insignificant lie, which could be readily and repeatedly produced in the laboratory.

31 subjects were trained to express and generate emotion by means of appropriately repeated dynamic forms of finger pressure on a sentograph pressure transducer, as described in previous sections. There were 18 male and 13 female subjects aged 22 - 59. Subjects completed three one-hour long sentic cycle training sessions as well as a number of additional practice sessions at home with a finger rest without a transducer before taking part in the experiment, and had become familiar with and enjoyed this method of generating emotion.

In the experiment subjects were asked to choose one of ten serially numbered tokens and hold it in their closed left hand. They then expressed and generated love, or anger, depending on the experimental run, with their right hand, using the timing clicks, as previously described. After a number of expressions to establish the emotion, for the next ten expressions they were asked with each expression: Do you have a 9? or, Do you have a 4? and so on including all 10 numbers, in randomized latin square order. In one type of run the subject had to answer 'No' every time, concurrently with the expression. In such a run the subject says the truth 9 times out of 10 - but lies for one expression when the number asked is the one he holds in his hand. The other type of run is the converse of this, the subject answers 'Yes' to each question, lying 9 times out of 10, and tells the truth when the number asked is the number holds.

Each expression by the subject was recorded with the sentograph. Two runs of each type were completed for each emotion, altogether eight runs per subject; a total of 248 runs consisting of 2480 separate expressions.

After each run the subject was asked to rate the intensity of the emotion experienced at the end of the base line period, during the question sequence before the singular expression, at the singular expression, and after it, on a scale of 0 - 5. Subjects had no difficulty to rate themselves in this manner. They were able to generate the emotions concerned with an intensity, indicated by self rating on a scale of 0 - 5, of mean level 3.17, s.d.0.83 for Anger, and mean 3.09, s.d.0.95 for Love (rated at the end of the base line period). The subjects were not aware of the aim of the experiment, and were told that it concerned the experience of numbers. As an objective correlate, the sentograph tracings were measured to examine differences in the expressive form before, at, and after the singular event (lie, or truth, respectively).

The results showed that for Love, there was an increase in intensity of love experienced at the singular event for 23 subjects when saying the truth (Yes series), and only 3 subjects for whom the intensity was lower. In the corresponding No series there were 21 subjects who experienced decreased intensity when lying was the singular event, and only 5 who experienced increased intensity (Fig. 12a,b). Lying blocked the feeling of love, in a large preponderance of runs: Love intensity was significantly reduced in 'lie' conditions compared to 'truth' conditions (  $F(1, 30) = 15.85$ ,  $p < .001$ , Yes series,  $F(1,30) = 12.65$ ,  $p < .005$ , No series; combined for both series  $F(1,30) = 20.87$ ,  $p < .0002$  ).

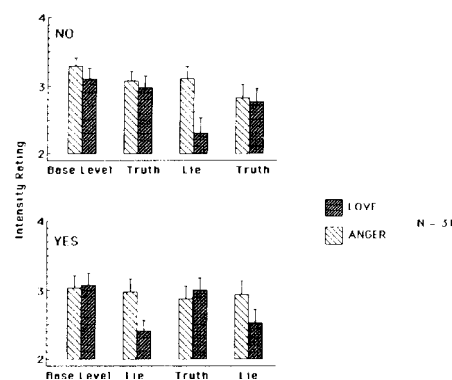


Figure 12 (a). Effects of lying on intensity experienced of love and of anger for two types of runs. In the 'No' series subjects necessarily first told the truth until their number was called, when they had to lie; thereafter they again told the truth for the remaining questions. In the 'Yes' series, the opposite took place, subjects had to lie until their actual number was called, when they necessarily told the truth; thereafter they lied again. Results show that in both kind of runs lying considerably reduced the rated intensity for Love but not for Anger. Mean ratings and standard errors of the mean are shown for 31 subjects.

In the runs with Anger the corresponding figures show no significant differences, or directions of change (Figs.12a,b). Indeed many subjects actually liked to lie when angry; for them the lie seemingly enhanced the expression of anger. (This phenomenon as a cognitive aspect of emotion may warrant separate study.)

Measures of the sentograph forms recorded showed a significant ( $p < .02$ ) shortening of the post peak duration of the love expression when lying, indicating an increased withdrawing after the maximum pressure is reached, compared with the love expressions when telling the truth (mean reduced by 11% from 3.37 sec to 3.03 sec). By contrast the corresponding sentographic expression of anger showed no significant changes.

(It should be mentioned that a related type of withdrawing behavior is often sentographically observed in conditions of expressing shame. See also Lewis(1979).)

The effect that the process of answering itself may have had on the intensity of emotion does not affect the conclusions, which show the differences in intensity experienced under truth and lying conditions. It can be seen from Fig.12a that there is little difference in the rated mean intensity between the base line period and the first period of questions for which the answer was the truth, indicating that answering the question by itself without lying had apparently little effect on the intensity experienced.

It is possible also that there may be subtle changes in the Anger expression for those who take delight in lying when angry, as compared with those who are indifferent to whether they are lying or not. Such differences could be meaningful in terms of character structure. An unexpected cognitive aspect came to light in a similar experiment involving the emotion of Grief, when it was noted that many subjects forgot, during the run, what number they had in their hand . Such forgetting happened only rarely with other emotions. It appears likely that the generation of grief, joy and other emotions by the present method can be used advantageously to study how memory functions may be variously affected by specific emotions. Previous such studies used hypnosis to generate emotion (Gilligan and Bower, 1984; Bower, Gilligan and Monteiro, 1981).

The results with Love and Anger tend to validate some aspects of the popular commonly held view that love is connected with being “open”, “sincere” and “guileless”. They show a necessary connection, at least at the time of expression, of not lying with the experience of love. ( An objection might be that it may sometimes be necessary to lie to persons whom one loves in order to protect them. What is shown here, however, is that at the time of such lying the feeling of love will be temporarily inhibited, or blocked. The liar in this case sacrifices his own momentary feeling of love for the well being of the other). Such a connection, leading to conscious results, can be considered to operate on a neuronal organizational substrate linking the processes of thought and feeling; probably not unlike those that may operate in “instinctive” animal processes. This connection is clearly a significant property of the nature of love. There are of course many other cognitive aspects of this emotion that need to be investigated.

Love has not generally been a popular emotion for study in psychology, with the exception of “being in love” romantically. Often it is not even listed among the basic

emotions (Izard,1977; Plutchik,1980). As previously suggested, such omission is not shared by musicians however, for whom it may be clearly and specifically found in the works of Mozart, Bach and Beethoven, for example (but without the “love object” of course, i.e. as generalized love).

## **Apollonian and Dionysian Mode of Expression**

A few words should be said about the existence in humans of two different cognitive modes of expressing (and also of experiencing) emotion, both of which may be used in sentic cycles. With the more common one, which we share with animals, called Dionysian, emotion is expressed and experienced as an ego function - it is one's ‘own’ emotion. In the second mode, called Apollonian, the emotion is expressed (and experienced) as a general or universal quality, is ‘quoted’ authentically, with a very clear idea of its quality, but not as one's ‘own’ feeling; in short, as “the emotion” - not as “my emotion” (Clynes,1977,1980). This mode is very potent when expressed with precision of the dynamic form. But it involves the body less ‘viscerally’, i.e. its body images, and associated sensations are not projected on one's own body, though experienced mentally. For example, one may be keenly aware of the heaviness of grief, but not feel it in one's own arms and legs.

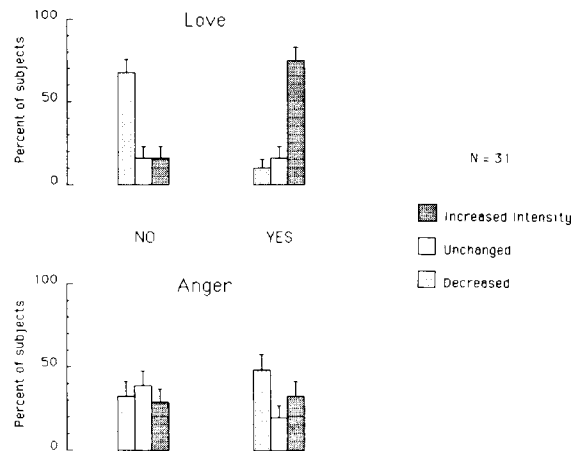


Figure 12 (b). Changes in rated intensity across subjects at the singular event: Lying - in the “No” runs, left; Truth - in the “Yes” runs, right. The singular event occurred when the number held in the hand was called. For Love there was a highly preponderant increase in intensity when subjects spoke the truth, and decrease when they lied ( $p < .001$ ). For Anger there appeared to be no significant influence. In the experiment the singular event was always preceded by its opposite condition i.e. truth by lying and lying by truth, since the subjects answered No throughout the “No” run and Yes throughout the “Yes” run.

A third mode, mimicry, in which emotional expression is imitated with deliberate disconnection to feeling is of little concern in the present context. Interestingly however, humans are aware, though not necessarily by name, which of the three cognitive modes they are using.

## VII. Longterm Effects of Sentic Cycles and Therapeutic Applications

We may consider longterm effects of sentic cycles and generalized emotion as those effects that occur after at least six months of regular use. We shall here briefly summarize observations and appropriate modes of application drawn from 62 subjects of varied age and both sexes who have used sentic cycles from six months to several years. They have reported changes in their ability to communicate in, and the quality of their relationships, feeling of well being, and enjoyment of life.

It has not been practical so far to conduct longterm studies with control subjects; for example, subjects sitting quietly without expressing these particular emotions. Clearly however those who continue to use sentic cycles for a long period find it rewarding, or they would not persist in doing them. (There are a considerable number of long term users with whom there has been no continuing contact, and from whom no reports have been collected. Also, a large percentage of those who have learned to do sentic cycles use them on demand, whenever special needs or stresses arise, rather than systematically.)

We need to distinguish between a general improvement that may happen through doing sentic cycles without being specifically sought and improvement in a particular aspect that is being worked on deliberately. It is not always clear whether to leave a problem to be relieved by the general method, or whether to work on it more single mindedly.

The longterm use of sentic cycles through its focus on specific, pure (rather than mixed) emotions offers preventive and therapeutic effects that cut across a number of established therapeutic disciplines, but it allows the subject to accomplish results by him/herself.

It also has aspects of meditation, as the body becomes very quiet, except for the expressing arm, and the mind enjoys an unusual freedom of thought yet focussed on a specific emotion. (It should be mentioned here that there were ancient Buddhist practices of meditation on emotions, some of which included emotion symbols called Mudras; these however did not include active repeated expression (reserved for dance), the means to generate emotion given here, with its biologically appropriate timing and dynamic forms. The latter of course, make it readily possible for virtually anyone to do this.)

Applications, without claiming rigor throughout, may be summarized under the following categories:

## 1. Psychosomatic problems

For psychosomatic problems related to repressed or inadequately expressed emotion an initial two to three week period of sentic cycles twice a day seems generally to alleviate or eliminate the psychosomatic symptoms. It will also clarify to the individual what tends to precipitate these symptoms.

Having identified that process the subject can then, as a second stage, if they so wish, as in behavior therapy, associate this stimulus in fantasy with a different emotion of the cycle than the habitual one and thereby establish another associative connection. Once a subject has generated a particular emotion during the sentic cycle, he or she may then at will think of the particular stimuli that previously had evoked the psychosomatic symptom. Bringing this to mind frequently in context of a totally different emotion reduces the power of the original stimulus to evoke the symptoms concerned. After some time, perhaps three to five weeks the same stimulus may be sufficiently associated mentally with the new emotion so as to effectively lose its power to evoke the undesirable emotion and psychosomatic effect.

## 2. Character Structure

Continuing sentic cycle experience provides a way for a person to become more aware of their own character structure. It allows them to experience in fantasy their emotional reactions to many fantasized and real situations, often bringing to light unexpected emotional reactions which may then be investigated further through sentic cycle experience. Subjects also learn about their central feelings towards members of their family, their circle of friends and relatives.

There are a number of ways in which the longterm practice of sentic cycles crosses into the territory of psychoanalysis. The concept of transference and crosstransference may be readily linked to the concept of generalized emotion. Through generalized emotion it becomes more understandable to the subject how similar emotions may be applied (transferred) to a different person appearing in a similar context as in previous experience. Once this transference is understood by the subject it can also be counteracted to an extent if desired.

Childhood experiences frequently re-emerge from memory while doing sentic cycles and allow the possibility to reintegrate them into the present condition of the subject. Continuing evocation of the particular emotions over a period of time appears to relax the 'censor' function gradually, as previously pointed out, so that more material is released from the unconscious, affecting both dreams and recall during the cycle experience.

In connection with the effect of sentic cycles on the unconscious, *it should be mentioned that even if the mind appears to wander in portions of the cycle, as long as the expressions carried out have appropriate dynamic form an unconscious effect appears to be achieved.* The influence of the word announcing each emotion phase seems also to carry over the period until the next word is announced (cf. Kihlstrom, 1987).

Patterns of dominance and submission are often characteristically changed by longterm sentic cycle experience. Subjects who have been consistently dominated by their spouses lose their submission and become able to achieve equality. This often comes as a surprise to them as well as to their spouses and may call for significant readjustments in their relationship. Increased ego strength is very characteristic of longterm sentic cycle use. Subjects acquire greater self confidence and self esteem. They are able to interact more readily and with greater satisfaction with others. As their anxiety disappears they also become more desirable partners for others in manifold ways; but relationships relying on dependency lose their power correspondingly.

Subjects who are initially fearful and timid tend to lose their timidity and become more self assertive, and in consequence also more attractive. Those who initially are overbearing, or bullies, tend to become less overaggressive and more able to view themselves and others outside the dominance-submission axis. These patterns are related to inner insecurity. As the sentic cycles reduce the insecurity both of these aberrations may tend to fade.

One of personal psychology's basic tenets could be called "the domino law": what someone has done to you, you do to another. If early in life mother, father, brother or sister has consistently done something strongly emotionally provoking to you, you will later tend to do likewise to another person, given the chance. But if through generalized emotion one can realize that the same emotion can be experienced without the original input pattern, then dependency on this kind of imprinting may be reduced, and greater emotional freedom achieved (cf. MacLean, 1985). This is one aspect of long term emotional training that sentic cycles makes possible, with wide application.

Unlike many of the 'products' of psychoanalysis, persons tend to become more charismatic through long term use of sentic cycles. Much of charisma consists of ability at will to communicate any desired emotion while remaining in control and making it apparent that this control is exercised in unexpected, playful ways that leave a measure of inscrutability not about the emotional competence of a person, but about how the control is exercised. Ease of switching emotions which sentic cycles provides as well as familiarity with these pure emotions appear to contribute to the increase in charisma found with longterm users. While important analytic processes are engendered, the focus is more directly experiential and the subject is less prone to 'head trips', to dry intellectualizing with theory that are often too much part of psychoanalysis, and also tend to give rise to socially boring personalities - being involved with introspection of interest only to the person him- or herself. The introspection of sentic cycles however tends to promote vital sharing, and intimacy, as it concerns active, universal forms of communicating feeling, and also because it deals largely with 'pure' emotions rather than with mixtures, which are not as easily shared.

### **3. Specific Phobias**

In phobias the underlying situation causing the symptom is generally not known at first. The subject generally will describe bodily sensations that accompany the phobia such as constriction in the chest, breathing problems, specific pain and the like. It is then useful to examine the various emotions and see which may cause similar bodily sensations, since these sensations generally represent a partial bodily picture of emotion related to the incident or incidents causing the phobia. We have called these partial emotion body images "virtual body images" (Clynes 1973,1977). Having identified to which emotion the virtual body image representing the phobic symptoms belongs, we may then work especially with that emotion and use it as an emotional lens to draw up memories from the unconscious. A link can be made by the subject between the bodily sensations experienced and the recalled original cause when a situation in the past strongly produced that same emotion. This is experienced as a

very significant insight and discovery by the subject.

The next phase of the treatment is to reassociate that memory with a totally different emotion by deliberately recalling it during that emotion phase in the sentic cycle. After some weeks of this the phobia tends to weaken and disappear. Sometimes there may be a mild recurrence in which case the last phase of the treatment is reapplied.

Thus for instance a 23 year old married woman who would not drive a car, or go into an elevator, for several years because of acute symptoms, discovered through sentic cycles that the constriction in her chest and breathing patterns she experienced on such occasions were the same as she felt when experiencing grief in the cycle. She then remembered the intense grief she felt when six years before she was waiting in front of a tall building for her boyfriend to pick her up to take her to live with him, and that instead he came in an old car and told her he would never see her again, and drove off. She then went up this building in an elevator. Having made the connection, and relived the grief, the phobia shortly disappeared with further sentic cycle experience, and other associations of that boyfriend with different emotions.

In other cases however phobias may disappear spontaneously through the general sentic cycle experience over a period of time without any particularly focused procedure. Thus a sixty-seven year old three times married man lost his intense irrational fear of dogs which he had had for decades, after eight months of regular sentic cycle experience, that also removed his submissiveness to his spouse, and restored his potency. Whether in these cases the subject himself might be reassociating his inner experience without particular methodologic instructions is not known.

#### **4. General Anxiety**

Freefloating anxiety appears to diminish steadily and consistently with regular use of sentic cycles, as an unsought byproduct. We may speculate that this is brought about both by chemical factors involving the production of neuropeptides with the various emotions and the total cycle experience, and by mental and unconscious processes relating to being in touch with one's emotional sphere, i.e. losing one's alienation.

These long term effects can generally be distinguished from the efficient use of sentic cycles to decrease anxiety and nervousness before special occasions, such as exams or public appearances, although for regular users the two effects appear partially to merge.

#### **5. Addiction to Alcohol and Drugs**

In combatting addiction to alcohol, drugs, or smoking, sentic cycles may be of assistance in two ways:

1. During the cycle a person generally has little or no craving for the addictive substance.
2. The satisfaction of the cycle may enable a person to be less drawn to the addicting stimulus. One may speculate that neuropeptides and endorphins produced by the processes of the cycle might act in some way to diminish the potency of the addictive desire.

To be continually effective against addiction it is generally desirable to use sentic cycles in conjunction with other forms of supportive therapy that provides human interaction. Thus for example the Alcohol Abuse Combatting Center of the Catholic Church in Brisbane has obtained good results using sentic cycles together with psychotherapy in the treatment of 23 alcoholic priests and nuns.



## 6. Sexual Problems

### *1. Problems due to general anxiety and lack of self confidence.*

As sentic cycles in the longterm are very helpful in diminishing anxiety and self consciousness, sexual function and enjoyment tend to improve considerably. This applies to both males and females. For instance, a female subject reports after eight months "I now have more arguments, but more orgasms". A woman in her fifties (a TM teacher) re-established satisfying and regular sexual relations with her husband after virtually ten years of abstaining.

### *2. Sexual touch.*

With continuing practice of sentic cycles, the sexually arousing form of touch with characteristic dynamic form can be better and more clearly produced and received; and distinguished from other forms of expression. Reports tends to emphasize greater communication, arousal, and responsiveness, more intimacy and less selfconsciousness. Much prevalent confusion is avoided between touch forms of affection and of sexual desire, and yet one form can merge naturally into the other, not unlike how one phase follows another in the sentic cycle, in mutual feeling and action. Ability to express sexuality clearly and appropriately when desired increases confidence in both males and females. While some individuals have this ability seemingly as a gift, others can benefit from acquiring it, as a natural function (rather than as a 'technique').

### *3. Problems relating to specific childhood experiences or later traumatic events.*

With regard to specific problems of a traumatic kind, such as rape or molestation, sentic cycles can be used as with phobias both for abreaction and replacement, that is, reliving the experience with a different emotional background and do this for scenes before, during, and after the traumatic event. With systematic practice of this, using a number of different emotions, reduction is possible in the prolonged emotional transformation, shame, and change in character structure that these events tend to cause. Sentic cycles have helped to re-establish potency and to overcome frigidity caused by traumatic incidents.

### *4. Problems of power and dominance in a relationship.*

Sexuality often becomes enmeshed in dominance - submission linked to personality structure. Such roles and games can at times degenerate into fixed patterns from which it may be difficult to escape. Sentic cycles permit persons to effectively explore different role functions, and in time incorporate these into practice.

Sado-masochistic tendencies may be rooted in ancient and possibly repressed (psychic ?) pain, which may be rediscovered, and worked on to be restructured by steps similar to those described for phobias. The sense of power, one could propose, may be regarded as an emotion itself, that can combine with other emotions.

### *5. Constitutional problems.*

It would seem sentic cycles can offer merely a confirmation or disconfirmation of what may be regarded as constitutional sexuality, but not change. It may be futile - to the extent that data are available - to attempt to alter established homosexual patterns; but sentic cycles can well be useful for example to re-establish the confidence in heterosexuality of a person who may have been exposed to an isolated incident of homosexuality (or vice versa). An interesting application would be to study whether and for whom bisexuality involves lustfulness without imagery, i.e., is a restriction rather than an expansion of sexuality.

## 7. Depression

One of the most promising applications of sentic cycles seems to be to provide help for mild to moderate depressions. (The main difficulty is to get a person to do the cycles when seriously depressed. If another person is available to ensure that the cycles are done with some regularity, they offer help to seriously depressed individuals also.) Benefits appear to be provided regardless whether the depression is endemic, biological or reactive in origin. For example, a 63 year old woman who, like her mother had, suffers from periodic six months long serious depressive phases, has used sentic cycles consistently two or three times a day during these phases, for three years. She reports consistently that she is able to bear these phases much better with their use, and has been able to use far less medication, or none at all. Good results are also obtained with reactive depressions, for example those often encountered with divorce situations. These benefits do not require intervention of a therapist; the persons concerned learn how to do the cycles from the instruction booklet provided, quite easily, even though depressed.

Frequently, a depressed subject may not be able at first to experience joy in the cycle, to any degree. To overcome this it is useful to deliberately imagine scenes that would help with the experience of the emotion concerned, for example to imagine being in a beautiful garden, perhaps as a child, and after a number of such tries the subject may be able to feel joy at being in such a garden, in fantasy. As the feeling of joy is gradually rediscovered, the expression gradually assumes a natural vitality and dynamic form that in turn enhances the feeling. (A similar process towards authentic feeling and expression takes place for anger, say, or one of the other emotions, if a person has difficulty with expressing that emotion.) Transfer from fantasy to reality occurs with repeated sentic cycle experience, illustrating one facet of how fantasy and reality are interwoven. But one should not lose sight of the fact that the total cycle experience and its after effects, rather than joy by itself, appears to be the main effective factor in relieving the depression.

Another aspect of long-term use of sentic cycles may be some increase in awareness of sensory stimuli, colors, sounds, and shapes as well as increased tactile sensation. One also may have the opportunity to observe that acute pain such as a toothache can be reduced while expressing love on one's own body, e.g. on the contralateral hand; and also that such pain is increased while expressing grief.

### For General Use by People at Large

But perhaps the most widely useful therapeutic and preventive application of sentic cycles is in overcoming a deadening cynicism, a blunting of sensibilities and depersonalization that tends to spread like an epidemic. Such culturally induced cynicism, alienation and/or mild depression results in inability to feel joy, other than at exceptional circumstances.\* But sentic cycles readily transmute that cynicism and these blase cynics may become glad, perhaps even almost 'young at heart' and grateful for some wonders of existence they can now tap at first hand. That this can be done with such a simple device is merely a compliment to the frugality and harmony of nature. Like music.

\* In a sense, the effects of the sentic cycle can appear to run counter the prevalent United States cultural milieu. To a cynical mind their effects can seem disturbingly magical, forgetting that even the simplest things are not in essence comprehensible. To such a mind magnetism loses its magic. The emotional freedom that sentic cycles give appears outside the purview of Western culture, although not as much outside the view of other cultures such as the Balinese. Had music and dance not been invented many thousands of years ago, they probably would have difficulty to be accepted gladly in today's pill and pragmatics oriented social environment.

## VIII. Generalized Emotion in a Social Context

A few last words may be in order to consider some social aspects.

The rhythms of language, and socially prevalent body language patterns to an extent tend to create a generalized “atmosphere” or ambiance with some emotional overtones characteristic of different countries and cultures (see also Byers, this volume). Sentic cycles permit an individual to be liberated, to a degree, from this immersion. Unlike music which generally is influenced by a nationalistic pulse, the art of sentic cycles is free from nationalistic influence.

### Emotions as System Functions

Socially produced anger, and hate incited by injustice and oppression, as well as repressed anger, can, as is well known, readily be manipulated and whipped up by demagogues, generalized and directed at scapegoats of their choosing, and escalated. Of these processes involving “waves” of emotion we see historical as well as current examples.

Fear and the duty of governments to protect their citizens contribute to arms build ups. The desires of the peoples of the world to be friends are in effect trampled on by their governments, who try to produce fear in other governments. Escalating positive feedback is a danger equally manifest in social as well as in individual relationships - and is a systems property.

How these emotions are transformed following massacres, the associated satisfactions, and how shame, guilt and triumph spread as social waves of emotion need far greater study. The methods described here make it possible to design some relatively simple experiments involving generalized emotion, to shed light on cognitive aspects of these processes, in a laboratory setting.

### The K2 of Love in Social Construction

Sociologically, love has played a major role in establishing and improving societal norms, in the religious sphere, in the pursuit of ethics and justice, of human (and animal) rights. Much of that role can be attributed to the K2 properties of love. The sociologic question is to what extent can love provide a solution - a *modus vivendi*, if we make better or fuller use of its K2 factor. Different societies have provided different answers to this in the past.

Currently, we ask ourselves - must we fight nature and human nature destructively, to live in accordance with it? There seems to be a natural paradox. We live with a permanent blind spot to our own killing: it is only a matter of the size of the blind spot - either we kill animals in order to eat, (when we don't kill people for our perceived self protection), or at the very least - and are we so sure that it is the least? - we kill insects, and certainly microbes.

The generalized love in music and in sentic cycles has no address though it has a message. It does not supply its own address. It seems part of our freedom, to choose and be responsible for that address. Even Beethoven could eat animals between symphonies and laugh when the Jewish community wanted to commission him.

But not only our inner filing system needs care. The problem needs to be addressed that no-one can love all the time, given the brain's biochemical structure and function.

### Need for Variety

It seems that some alternation of emotions, or variety is a necessity for maintaining aware vitality - to avoid saturation of the receptors and resulting staleness. No one has yet adequately studied boredom as an emotion. The need for variety is fundamental, born directly from the way the brain is constructed. Channels of communication by design tend to be more

sensitive to change than to continuing conditions, and relatively desensitize sooner or later for any particular steady condition (cf. also Clynes 1969b, 1961, 1962). This is one reason why we prize creativity, which banishes boredom without trying - as also we are never bored when we dream.

## **Emotion, Knowledge and Reality**

How real is the knowledge (K2) of emotion? Obviously we often view matters with considerable distortion depending on emotion. But in another sense, viewing something without emotion is not viewing it at all. Interest itself may well be considered to be an emotion (Izard, 1977) (what then is the K2 of Interest? cf. Clynes, 1977, where the special emotion when searching for an idea was named "apreene").

Strangely the practice of sentic cycles makes us remember, to an appreciable degree, what we are. The neurohormonal substances it presumably releases may help this to occur. We may hope that chemical intervention too, in the future will not lead to another round of horrors such as Aldous Huxley, however well meaningly, helped to precipitate, but to progress in what a human can be - towards a world Beethoven opened up for us in his last quartets that so few people have heard to this day. That which music has given us - *Seine bessere Welt* ("A better world" Schubert's song, "An die Musik") need not now remain outside our life-lines as a recreation. Knowing essentic forms consciously we may, all of us, use them as creation, without the dictates of composers, according to their natural properties, to form our own life-lines.

## **Toward a new social integration of emotion**

We may see that the misuse of the knowledge of emotion leads to emotional bias, but its constructive (Apollonian) use leads to understanding of oneself and of others; to humaneness and empathy. The "knowledge" of emotion, its cognitive output substrate (K2), has in the past been largely neglected as scientific study - but is of great consequence - probably the most important aspect of emotion affecting individuals and society. On one hand the K2 of love largely constitutes the basis of systems of ethics, the K2 of reverence the fundamentals of religion; on the other, the K2 of hate and fear are manifest in the genesis of war and organization of persecution.

In personal life and in the function of society, as well as in art, emotion's K2 includes a way of viewing others as well as oneself. We do animals injustice when we call ourselves "beastly." But how may we justly view ourselves? Man will be the only animal that knows about the knowledge of his emotions, and will be able to use that knowledge for ends of his choice. Will these ends be tinged with emotion? Necessarily so, for sociopolitically, and individually, man cannot escape the prison of his emotions: the "pursuit of happiness" is, so it goes, guaranteed by the constitution - and 'the peace achieved by being in harmony with the universe is both emotion and knowledge past our understanding'.

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Indeed, psychopathology of emotion may become clear only to the extent that emotions are understood, individually and socially. Here we have described a theory and method derived from experiment that provides a small, intriguing step toward this. Much indeed remains to be discovered on that road, concerning these unique entities with built-in windows across the mind body barrier, and their tappable power for the development of the individual, of society, and even for the now selfconscious evolution of man.

## Summary

The nature and production of generalized emotion is discussed. A theoretical distinction is introduced between cognitive factors giving rise to the emotion, K1, and cognitive factors or substrates affected by the generalized emotion as output functions, K2. A new easily learned touch art form of expressing and generating emotion is described, and a 27 minute long touch composition called sentic cycles, performed by finger and arm pressure in a sitting position, with the rest of the body quiet, which effectively generates the emotions of anger, hate, grief, love, sex, joy, reverence in turn. The ability to generate emotions in this way is seen to rest on the innate coherence between the dynamic form of the expression and the emotion it expresses. The 'better' (or more authentic) the expressed form, the more powerfully does it act to generate - and this is felt as a biologic feedback. Results from a large number of subjects are shown that compare intensity ratings for different emotions for men and women, and for United States and Australian subjects, and also with repeated sentic cycle experience. Preventive and therapeutic applications are given for emotional balance, integration and wellbeing through home use by subjects of sentic cycles and this method of generating unmixed or 'pure' emotions. These are seen to rest on cognitive, memory, and cathartic functions of the specific emotions. Applications relate to psychosomatic problems, character structure, phobias, general anxiety, sexual problems, drug and alcohol addiction, and depression. Sociologic aspects are discussed briefly.

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## Appendix A

### Timings for the Start of Expressions for Sentic Cycles (soft clicks)

Next click occurs after	5.322	5.839***	
an interval of:	6.941		
No. of seconds	6.451	9.465	
	4.722	0.137	Spoken: <i>GRIEF</i>
Spoken: <i>NO EMOTION</i>		5.643	3.908
5.269	4.777	7.403	
5.619	7.269	8.732	
6.208	4.844	8.501	
4.360	6.288	8.467	
6.873	6.266	8.564	
5.487	6.405	7.539	
5.138	6.209	7.421	
4.359	4.256	8.786	
5.107	5.878	8.274	
5.455	4.952	7.694	
5.413	6.359	7.484	
4.718	4.352	8.106	
4.284	5.048***	7.972	
5.104		7.960	
4.089	7.271	8.348	
5.550	0.140	8.604	Spoken: <i>HATE</i>
5.650	3.767	7.403	
4.228	4.261	8.781	
5.765	5.183	8.425	
5.269	5.354	8.798	
6.499	5.328	7.876	
4.206	4.212	7.318	
4.548***	5.759	8.833	
	5.513	8.142	
6.883	4.276	8.271	
0.445	5.880	8.566	Spoken: <i>ANGER</i>
4.391	5.506	8.918	
4.179	6.378	7.744	
4.616	4.767	8.718	
5.483	5.566	8.172***	
4.354	5.891		
5.253	5.3641	1.729	
5.272	6.799	0.136	Spoken: <i>LOVE</i>
5.781	5.643	9.136	
6.515	4.046	8.898	
5.338	4.749	7.479	
5.811	5.841	9.301	
6.039	5.979	7.382	
6.377	5.723	8.339	
6.660	5.630	8.642	
4.399	5.731	7.838	



5.148		6.085		8.738
8.680		5.799		6.748
7.873		4.248		4.447
9.151		4.866		4.254
8.933		4.539		7.168
7.351		5.702		5.386
7.957		4.232		6.217
8.256		4.958		4.657
7.227		5.336		4.412
9.047		5.637		4.212
9.604		4.032		4.771
8.332		5.201		5.469
8.722		5.448		5.660
7.465		4.238		4.050
8.227		5.413		4.829
7.948		5.222		5.369
8.594		4.732***		4.117
8.504				5.414***
8.205		5.503		
7.477***		0.346	Spoken: JOY	6.448
		4.656		0.408
		6.681		5.443
10.028		4.903		6.382
0.068	Spoken: SEX	5.504		7.479
5.332		4.688		7.068
4.310		5.665		7.663
4.772		5.169		7.151
5.575		4.910		7.628
4.152		5.439		6.813
5.572		4.220		7.953
5.515		5.540		7.790
5.669		5.493		8.700
6.546		5.812		6.499
4.863		5.769		6.833
4.142		4.214		7.580
5.318		4.734		7.291
5.147		5.959		6.668
5.003		4.824		7.578
5.594		4.366		7.716
4.760		5.367		8.158
4.223		5.522		8.056
5.551		5.136		7.696 ***
5.925				
5.850		4.606		

\*\*\* Indicates the last click for that emotion. The following timing interval is from this click to the announcement of the next emotion .

These timings are available recorded on tape, together with a finger rest and instruction booklet for doing Sentic Cycles, from the American Sentic Association, Box 2176, La Jolla, Ca. 92037, (\$32.50). Information on Sentographs may be obtained from the author.

# Appendix B

## Sentic Cycle Worksheet

This is an example of a sentic cycle worksheet, completed for each cycle, about half an hour after the experience, except for the after-effects comments, which are filled in later. This particular example is after the first cycle completed by the subject, a 37 year old Australian female hospital aide.

While the contents of reports vary so that no single report may be described as typical, it may yet be called typical in the following ways:

1. The remarks indicate clearly that the emotions were experienced.
2. The emotions were experienced the very first time the cycle was done.
3. The after-effects described are typical.
4. Specific body effects described are typical.

It is atypical as it contains less than usual reference to old memories, and other people.

### ANGER *Intensity Rating 2*

I was greatly involved physically in this emotion, more so than for any other in the cycle particularly the clenching of my jaw and mouth and the tightening of my abdomen and shoulders. I seemed to move my head holding it sometimes sideways, then partly lowered. I was very alert and keyed up for each signal. Yet while I was ready to act immediately the signal went like a starter's pistol, I also found myself hanging on to the last thrust, like a bulldog. I felt hot. There was no particular image involved, more the emotional process itself. My breathing built up markedly and became strong to my ears, so that I became momentarily selfconscious.

### HATE *Intensity Rating 2*

This experience came on more slowly than did anger, but built to an intensity that seemed to go into some 'cold' stage beyond the former hot one. The hatred seemed to pour from my eyes, so that my head was held straight, perhaps slightly raised, as if I was glaring fixedly at whatever I was confronting. I felt I was confronting various anti-life forces, and images of evil then began to flow in the form of destructive possessiveness or parasite life-styles.

### GRIEF *Intensity Rating 2*

A vast sadness flooded over me and I felt physically reduced in size and lacking in shape. I felt I had shrivelled up, or that I wanted to curl up and cut off. I did not want to look outwards and in fact had difficulty in keeping in contact with the 'here and now' sufficiently to hear the signals (clicks). I felt that I may have let a couple of beats pass unnoticed. I remembered how I had felt when I lost my own Paradise - when I had the shocking awareness that the world I have loved and frolicked in was largely a social consensus reality. Then, the memory became an affectionately viewed foible, and I was content to move on again.

### LOVE *Intensity Rating 4*

I was filled with a great tenderness and a beauty that hinted elusively at something exquisite. There was a stillness and peace. My finger pressure seemed slow and gentle, but so powerful. I enjoyed each beat (expression started by a click) and took each renewed chance to experience and express this wonderful feeling. It culminated in an image of the few ...people I know and of my own unconditional love for them - a feeling that suggested freedom the same way as the feeling of anger had suggested the tyranny of hanging on. I thought of a man I love.

### SEX *Intensity Rating 2*

This triggered off a train of sensual imagery - particularly smells and sounds. I saw part of a sweaty body, and panting sounds of breathing. My own body responded. My finger movements were at first sharp and rapid and tended to prematurely anticipate the signal. They then became coordinated with the beat, and became slower and more subtle, to the point of barely touching the finger rest. I became aware of a mounting

excitement in my vagina, along with almost holding my breath. I was not ready for the directive to change emotions, and felt left up in the air.

#### JOY *Intensity Rating 4*

My initial hesitation at leaving the last emotion vanished the instant I realized that it was joy that I was to express. I leapt at this opportunity and the feeling came to me more readily than any other emotion. My neck seemed elongated and my body felt skinny and nimble. It was beautifully sunny I seemed to be trotting along on a horse, on some voyage of self-discovery. I was thrilled at finding life even more wonderful than my optimistic expectations had led me to believe. I felt naive. I could hear Keith Jarrett playing his Cologne Concert as an affirmation of life. I was filled with a sense of trust and leapt simply into the next emotion.

#### REVERENCE *Intensity Rating 4*

A powerful feeling slowly gripped me. A strong sensation came into the pit of my stomach. My body was still suspended. I seemed to hold my breath and search the sky of my mind with my eyes. An overwhelming expansiveness filled me, and I had intimations of being initiated into some profound mystery. Time and place became irrelevant, and while I was aware that the session had ended, I remained in that state for some minutes.

### GENERAL COMMENTS AND EXPERIENCE AFTER DOING CYCLES

I opened my eyes to find that people seemed more self-contained than when I had closed them, and that a certain sensitivity reigned in voices and movements, where before there had been a coarsened *joie de vivre*. I felt reluctant to get involved with any immediate conversation, preferring to stay with my own feelings. However, when someone initiated contact with me, I responded with a greater readiness than I had expected.

At bedtime, I felt highly alert and so prepared to lie awake and absorb my experience further, whereas in fact I fell straight to sleep.

Next morning, I was filled with a sense of well-being,... with a heightened sense of awareness and sense of satisfaction, both of which seemed to come from having been intimately in touch with another part of myself.

To give the reader a feeling for the development of insight into each emotion as more cycles are done, we shall here show the remarks by the same subject for the second and third cycle, done within one week of the first cycle, for Grief, Love and Joy only (in view of space limitations). (For further contrasted examples, see Clynes 1977.)

### SECOND CYCLE

#### GRIEF *Intensity Rating 3*

(Three days later)

I felt a great loss, as if I had not only been drained of everything inside me but had also lost my framework, my orientation, .... I felt unresponsive. There was a sameness, and endlessness about everything, like a *deco*. Even individual images did not bring about an individual experience. My finger seemed to have nothing to express that was in any way different to the all pervading greyness about me. All subtleties and nice differences in values seemed to vanish, and I had to periodically force myself to get involved almost mechanically, in what was happening at the moment.

#### LOVE *Intensity Rating 4*

Love flowed in and filled the hollowness of my grief. I became self-regenerating, reborn. My face melted with softness, and my touch was gentle and rich. I felt receptive and responsive and capable of true fellowship. I felt in no hurry to express my feelings as already I felt effective. I felt the sure hand of integrity, and was filled with a simple honesty that brought me face to face with my love, with little need for supporting acts. My

body listened quietly to the beautiful flow within me.

JOY *Intensity Rating 3*

I felt myself growing taller and lighter. This quality had a higher pitch, and rose to that pitch, rapidly. A jubilant bubbling up from within called for more movement than did love. This feeling was unable to contain itself, and was uncontained. My touch was perky with vitality. I had the sensation of floating over the roofs of houses on Mercury's winged heels, as in some Chagall painting.

THIRD CYCLE GRIEF *Intensity Rating 4*

(One week later)

My shoulders sagged, my cheeks and jaw fell, and all remaining life drained out of me in a heavy sigh. A heavy led hand fell upon heavy thighs above heavy feet. The right hand would rather have hung than have lined a finger, but did so mechanically because it had been directed to and did not have enough initiative to decide otherwise. Each touch was inconsistent within itself, ambivalent, as if saying something and then retracting it. While I went through the motions, still the act of pressing on the finger rest seemed pointless: my cry had no voice, and there seemed no one out there who could hear - and even if there was, I felt incapable of responding to any input. I was caught in some terrible inertia. My eyes seemed now to look without seeing. This state was interminable. All past losses seemed cumulative and all the present contaminated.

LOVE *Intensity Rating 3*

I welcomed love like a dear friend, I felt at home. I affirmed and was reaffirmed. My finger softly told of my love with a touch that was gentle but sure. My quiet breathing echoed my trust. If not complete it did not matter. I was free, and yet related.

JOY *Intensity Rating 3*

A light tripping motion took hold of me. I tapped gracefully at the finger rest. I felt buoyant and pure in heart. My finger movement seemed deceptive in its simplicity, but my touch expressed a feeling for life that had little need to plumb the depths of any deeper understanding. I was uncomplicated and contagious.

GENERAL COMMENTS AND EXPERIENCE AFTER DOING CYCLES

(*Second Cycle*)

After doing the cycle I felt a sense of equanimity and calm. I felt content to be alone and to continue experiencing my fullness. The next day I felt my usual sense of well-being but with a difference. My feelings were more differentiated and throughout the day I found myself responding more spontaneously and being more aware of the nuances of each response. In particular, I was markedly more aware of the physical side of my "inner experiences. I found the writing up of my experiences to be a most clarifying aspect of doing sentic cycles.

(*Third Cycle*)

Doing sentic cycles is like walking the dog: my emotions look forward to getting exercised. I am particularly surprised at the amount of body-awareness that I have developed, and I have a growing appreciation of the extent to which an emotional experience is a total experience. Having my feeling at my finger-tips has not made my daily life any easier but it has certainly made it livelier, more honest than conventional. On occasions, when responding "colorfully" to a situation that I have not been accustomed to responding to in this way, I have gone away like a child with a secret, feeling that only I knew that my sentic cycles were behind this storm in the teacup. Doing sentic cycles, for me, is both a clarifying and a purifying experience.