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FORMS OF KNOWING IN THE STUDY OF THE FINE ARTS

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This paper examines the kinds of knowing necessary to the personal development of the fine art student. First in the light of the theory of tacit knowing, and second on the basis of the twin-strategy model of brain function. Together these approaches suggest a concept of "tacit consciousness" relevant to the thinking processes associated with fine art study. In particular, they suggest a delicate relationship between two complementary activities: one generative of visual imagery, senses of meaning and of significance; the other incorporating and interpretation and organization of the results of the first. While the exercise and development of tacit consciousness may be disrupted by the intrusion of the rational-linguistic mode of thinking, we should nevertheless resist the temptation to sanction a distrust of rational analysis and criticism.

The purpose of this paper is to tackle the following question: does the practice, and hence the study of the visual arts rest in some mode of thought or form of knowledge which is different to (perhaps of a more primitive kind than) that associated with practice and study in verbal fields? This question arises out of the idea that "pictorial intelligence" is, in the words of a follower of Freud:

... relatively unorganized, primitive, magical, undifferentiated, based on common motor reactions, ruled by emotions, full of wishful or fearful misconceptions, archaic, vague, regressive, primal. (Fenichel, 1945)

The question is important for four reasons. First, because artist-teachers experience difficulty in specifying what they know. Second, it has been argued that visual art students should be selected for a form of intelligence which is "spatial, manipulative, constructive, inventive, sensory, somatic, intuitive-psychic, imaginative and poetic", and which manifests itself in "talent and motivation" (Dewdney, 1973; Cornford, 1975). Thirdly, there appear to be important interactions between the verbal and non-verbal components of advanced visual art studies (Cornock, 1983; 1984b). Finally, all of these considerations bear on the legitimacy of visual art studies within the higher educational field (Robinson, 1982).

TACIT KNOWING

Some experiences seem to be literally ineffable. A painting, a piece of music or a dramatic performance leaves us "lost for words" to describe the experience. Again, it is impossible to transmit verbal information to ensure recognition of a particular face. One *could* use the telephone to transmit instructions on the physics of bicycle-riding (e.g. "to compensate for a given angle of imbalance which we will call "a" take a curve on the side of the imbalance with radius "r" proportional to the square of the velocity "v" over the imbalance; r is then equivalent to v^2 over a") but to little avail: such information is wholly literal, and conveys nothing of the "feel" essential to knowing *how* to ride a bicycle.

The principle which guided the philosophical enquiries of the scientist Michael Polanyi was that "We can know more than we can tell". He divided the realm of knowledge into three areas (Polanyi, 1958, p 87):

- first*, the ineffable, or tacit domain, where that which we know is virtually impossible to verbalize;
- second*, the area in which the tacit components of experience overlap with that which can be rendered articulate; and
- third*, the area in which symbolic operations outrun our understanding (our powers of what Polanyi calls "tacit integration") so that the tacit and the formal fall apart.

His aim was to attack the third, wholly formalized, form of knowledge, and with it the positivist assumptions embedded in modern science, whose declared aim he characterized as being: "... to establish a strictly detached, objective knowledge" and within which "Any falling short of this ideal is accepted only as a temporary imperfection" which science aims at eliminating (Polanyi, 1967, p 20).

The second of Polanyi's three parts of the realm of knowledge is that over which science has authority; but it is to the first, the tacit, that he consistently draws our attention. What he is saying is that the roots of knowledge lie in this, the tacit dimension, and can never be wholly and satisfactorily formalized. Polanyi's critics (such as Lakatos & Musgrave) have seized on his contention that knowledge cannot be made wholly explicit as evidence of deliberate avoidance of rigorous thinking (Brennan, 1977). However, Polanyi's central thesis is not that allowance must be made for special instances of tacit knowledge, but that there is a tacit dimension to *all* knowledge.

Not only this, but (counter to the positivist view) explicit statements only gain meaningfulness from their tacit components. Knowledge is not, he is insisting, a disembodied, neutral accumulation, but rather it is *affirmed by someone*. Knowledge is personal, and what is more it can only be passed on to the extent that the learner grasps the affirmation of that knowing by an individual. Thus:

While tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. Hence all knowledge is *either tacit or rooted in tacit knowledge*. (Polanyi, 1966)

This is a philosophy which does not shrink from the sense that thinking is led by intuition; that insight will guide discovery. In his acknowledgement of the tacit dimension Polanyi recommends transforming a retreat into a triumph. For, whereas: "The original intention of logical positivism was to establish all knowledge in terms of explicit relations between sensory data . . ." Polanyi (1966) is recommending that we should not:

. . . recognize that tacit knowing is the fundamental power of the mind, which creates explicit knowing, lends meaning to it and controls its uses. Formalization of tacit knowing immensely expands the powers of the mind, by creating a machinery of precise thought, but it also opens up new paths to intuition; any attempt to gain complete control of thought by explicit rules is self-contradictory, systematically misleading, and culturally destructive.

—and ends this cogent statement of his central thesis with the conclusion that: "The pursuit of formalization will find itself its true place in a tacit framework".

The theory of tacit knowing distinguishes two kinds of awareness. Our *focal* awareness of, for example, the pressure of a hammer on the palm of the hand; as the tool is tentatively used to drive home a nail so the focus of attention shifts, and, although we remain aware of the hammer in the palm of the hand, that awareness is now *subsidiary* to our sense of the driving home of the nail. Polanyi extends his consideration of the role of these two kinds of awareness—focal and subsidiary—to include the blind man using his stick; the concert pianist; and the user of intellectual tools. All attend, he suggest, *from* the subsidiary instruments of their awareness *to* the things which they are thereby enabled to apprehend: physical surroundings, musical interpretation, abstract ideas, and so on. In this way: "the hammer, the probe, the spoken word, all point beyond themselves and are endowed with meaning in this context" (Polanyi, 1958, p 65).

To recapture a sense of the importance and difficulty with which we render cognitive or sensory objects subsidiary to awareness is not easy. A fascinating account has recently been given of a person, blind from birth, who has been the subject of an experiment in perception. He was given a pattern of tactile stimulation across his back which corresponded to the pattern of visual information being scanned by a television camera. "At first" he says "I experienced sensation on my skin. Then, gradually, the experience on my skin reduced to the point where I was unaware of it. That experience was replaced by a different experience 'out there!'" The circumstances which conspired to enable him to attend from subsidiary elements of tactile sensation to a focal pattern of "visual" information produced a profoundly significant and moving moment for him (Cf Skilling & Brightwell, 1982).

So, in discussing the tacit component in student learning we have in mind a form of knowledge which is rooted in the context of individual existences; knowledge is viewed as an act, and therefore takes the verb form in the essay "Knowing and Being" in which Polanyi (1961) speaks of a "structural kinship between the arts of knowing and doing" and thus carries us towards a theory of knowledge both relevant and congenial to art education. More particularly he gives prominence to the acquisition of skills (1958, pp 49-55) through the heuristic efforts made by the individual: that is, the way in which he approaches practice through the:

. . . process of unconscious trial and error by which we feel *our way* to success and may continue to improve on our success without specifically knowing how we do it—for we never meet the causes of our success as identifiable things . . . (Polanyi, 1958, p 62)

This passage is directly applicable to the way in which the student of fine art approaches studio practice. For, when he engages in critical analysis of his own works and those of others he is not provided with determinate judgements about fine art; rather, it is necessary to acknowledge, with Plato, that:

We can only discuss with ourselves or each other, playing our words, definitions, and images against each other in the hope that we shall "see" the Form they are imitating—that we shall "get" the Idea. (Prosch, 1973, p 203)

Student learning thus proceeds through active engagement in the twin processes of: (i) generating visual ideas through making in the studio; and (ii) critical (i.e. verbal) discussion of the products of (i).

Research suggests that (i) takes logical priority over (ii), as discussion must follow and serve the manipulation of forms and images (Cornock, 1983, pp 91ff). What the theory of tacit knowledge further implies is that verbal criticism neither specifies what shall be sought in visual form, nor determines our evaluation of what has been produced; in both physical and intellectual work "it is this tacit grasp which evokes and guides our attempts at articulate expression" (Brennan, 1977, p 151).

We can further tie this theory of tacit knowledge to our observations in the art school milieu. The topic of Brennan's essay is what he refers to as Polanyi's

transcendence of the distinction between subjectivity and objectivity. The test of what is known in the arts not merely a matter preference; to paraphrase Brennan, one does not choose his notions of artistic excellence as he chooses his treatment of a steak! Polanyi himself observes that: "Man can transcend his own subjectivity by striving passionately to fulfil his personal obligation to universal standards" (Polanyi, 1958, p 17). The authentic features of learning can be detected when we are groping for a solution to a problem (Brennan, 1977, p 144). This points back once again to the component of personal commitment (not mere subjectivity) which is central to learning in this domain, where there is not question of feeding the student a predigested portion of knowledge. The principle is that of construction: the student is *not told* what is meaningful; he *does not create* meaning out of nowhere; what he does is *to construct* a working process—images, forms and articulate ideas—which come to constitute what is, for him, meaningfulness, and in the appreciation of which he must engage others. That part of our knowledge which is unspecifiable is embodied in ourselves, partly in the form of our skills, and partly in the form of beliefs, understandings, insights and commitments. Human knowledge is also embodied in a literal sense; it arises out of the functioning of the brain.

TACIT CONSCIOUSNESS

Research into the structure and function of the human brain and the behaviour to which it gives rise has been vigorous in recent years. The results produced are subject to interpretation, and the interpretations have often been clouded with speculation. As a consequence of these problems and the importance of the subject it has produced a voluminous literature, and a critical review of relevant aspects of that literature forms a companion to this paper (Cornock, 1984a).

For some years the results of brain research have pointed to a division of mental labour between, broadly, verbal reasoning in one cerebral hemisphere, and sensual creativity in the other. It has been noted by some interpreters of these findings that our culture tends to suppress the sensual and creative hemisphere, whilst the educational system concentrates on developing the hemisphere specialized in verbal reasoning (e.g. Ornstein, 1972; Bogen, Dezure, Tehouten & Marsh, 1972; Samples, 1975; Blakeslee, 1980). The idea of a rational bias was seized upon as a scientific basis for the argument that *art* education should be addressed to the "intuitive" right cerebral hemisphere (e.g. Virshup, 1976; Foster, 1977; Chase-Marshall, 1978; Edwards, 1979). It is this fact which determines the relevance of brain research to this discussion.

The review (Cornock, 1984a) emphasized the need for caution in interpreting the results of neurophysiological research but nevertheless suggested that certain conclusions can now be drawn with some confidence. For present purposes these can be reduced to two.

First, the cerebral hemispheres appear to manipulate information on the basis of two fundamentally different thinking *strategies* in the overwhelming majority of the population: the left on the basis of linear sequences of symbols, and the

right on the basis of all-at-once iconic patterns of relationship. Because the functions are grouped within each hemisphere so as to co-operate within a particular strategic framework, a mutual inhibition of functions leads to a necessary *alternation* of conscious attention, according to the demands of the situation.

Second, a consequence of this putative alternation of thinking strategies is that environmental pressure can tend to increase the frequency with which an individual rehearses one or other of the strategies; after many years that individual's recourse to a particular strategy may be determined more by *habit* than by the needs of the situation. Education has been shown to constitute just such an environmental pressure. A result is a lasting shaping (or distortion) of the thinking habits of, at one extreme, graduate engineers, and, at the other, arts graduates.

However, the balance of the evidence suggests that our concern should not be to exaggerate one or other of those cerebral strategies but rather to recognize their interdependence.

The thinking strategy normally associated with the right cerebral hemisphere does not construct verbal reports on its own progress. The absence of such reports encourages the "dominant" part of the brain to characterize right hemisphere processes as "un-", "sub." or "pre-conscious", or simply to deny the existence of non-verbal consciousness. By contrast, it has been proposed by Gill (1980) that, precisely because right hemisphere processes are largely non-verbal, they might be considered the vehicle for Polanyi's "tacit knowing"; our review incorporates Gill's proposal and specifically associates those processes with a second form of consciousness. That is, with what we have called *tacit consciousness* (Cornock, 1984a).

It happens that the functions incorporated into this tacit mode of consciousness are more difficult to specify and localize than such left hemisphere functions as speech and writing. This has to be borne in mind in considering the many lists of putative right hemisphere functions, a summary of which is given in Cornock, 1984a, Tables I, II, III and V). What we can do is to associate emotional colouring and the attribution of significance to the tacit hemisphere. Further, tacit consciousness is characterized by an ability to react appropriately to a human situation. This is because the right hemisphere contributes sensitivity to the connotations and nuances of the various elements of the situation and thereby enables the individual to orient himself appropriately, using such non-linguistic cues as a tone of voice or facial expression (Freid and others, 1982). This sensitivity and orientation is clearly critical to the development of artistic sensitivity, and in this context we would include the ability to read an image incorporating unresolvable emotional responses; thus tragedy and comedy are combined, with an emphasis on the former in Gloucester's scene on the "cliff" in *King Lear*; and on the latter when Dr Strangelove rises from his wheelchair to take his first step in the eponymous film by Stanley Kubrick.

Thus, over time, conscious awareness of self and world is a synthesis of verbal and

tacit consciousnesses. For the most promising model of brain function is one in which the group of structures at the core of the forebrain serve to bring the appropriate functional areas at its surface into play; perhaps the best image here is one of orchestration, since groups and sequences of functions are involved in the performance of apparently simple actions. What is important here is the interdependence and complementarity of the hemispheres, for, when we come to examine a complex and high-level activity such as drawing, we find that functional areas on *both* sides of the brain are called into play. The "orchestration" of these contributions to the drawing process (or to any other) is essential if the brain is to avoid, first, a paralyzing struggle between its main hemispheric components and, second, habitual abandonment of one or other strategic approach to thinking. The consequence of the latter will be either to reduce thinking to the relatively dispassionate and wholly procedural; or to become lost in an aimless stream of (tacit) consciousness. So, we must avoid an abrogation of the networks of interdependence which bind the functions involved in artistic work. The suggestion that artistic ability is the prerogative of a specialized part of the brain is an impoverished one, and educational conclusions drawn from it misleading. Yet we should dismiss such claims as that made by Michael Youngblood (1979) that brain research has produced *no* lessons for art education. As we increase our understanding of the dynamics of information processing in the human brain we become better equipped to tackle some of the study and teaching difficulties endemic to higher education in fine art.

INTERIOR DIALOGUE

One of the study and teaching difficulties to which reference has already been made arises out of the need to verbalize non-verbal aspects of fine art study. That is, the difficulty of communicating tacit skills, perceptions and meanings for the purposes of the tutorial dialogue. Prior to this however the student must establish what amounts to an *interior* dialogue. A dialogue between the major hemispheric components of the lateralized brain.

At an advanced level the need for a methodical approach to the construction of (say) a drawing can be minimized. The process is conducted mainly in the tacit mode, Polanyi himself has stressed the fact that knowing is essentially acritical (1958). . . . But periodically the draughtsman emerges from that existential thrall so as to review and "discuss" his work with himself. What has been achieved is examined in the light of the purpose in mind at the outset; omissions and inconsistencies are noted; technical possibilities are considered (in this reflective and analytical mode the draughtsman might, for example, consider a sought—for compositional effect by constructing an addition to the picture area).

The left hemisphere has an important part to play in the conduct of these periodic debates. During pauses for critical review the artist's tacit consciousness will recognize various patterns of relationship and significance; but they now become subsidiary to a focal awareness of an internal "discussion" conducted by the articulate hemisphere. In this mode the artist can examine various aspects of

his work in turn, recall relevant knowledge and experience, and plan necessary actions. To function, in a word, *critically*.

In this speculative description the left hemisphere is modelled as an interpreter of and spokesman for tacit consciousness. For the right hemisphere cannot generate even the simplest proposition (propositional thought being the prerogative of the linguistic hemisphere). Interestingly, it has been suggested by Rhawn Joseph that, for early infancy, the left hemisphere is confronted by the stream of perceptions, moods and impulses initiated on the right, and has to try and explain them to itself (Joseph, 1982a). For the first few years the need for this effort is, Joseph suggests, imposed by the pattern of neuronal development; but, in maturity, when the vast network of interconnections between the lobes and hemispheres of the brain is complete, the need for interpretation persists. This reflects the idea that:

. . . the hemispheres essentially speak different languages (e.g. emotional-spatial vs serial-linguistic) and although there is much overlap in functional representation, when they communicate—interhemispheric information transfer—a considerable amount of information is "lost" in the translation. In this respect, each hemisphere must *interpret*, to various degrees, what has been processed in and transferred from the opposite hemisphere.

(Joseph, 1982b)

The key term in Joseph's statement is "translation" since information remains encoded in mutually incompatible forms; on transfer it has to be recoded. The new representation will stand in relation to the original as a perception stands to the thing perceived, in that there is, potentially, an infinite number of conceivable conceptions of that original, and:

Perhaps in some instances this results in *guessing, confabulation, self-deception*, etc. as each hemisphere attempts to make sense out of what occurs in the other.

(Joseph, 1982b)

Emphasis has been laid on the representation of the objects of tacit consciousness in the realm of verbal intellect, and vice versa because it points to two conclusions. First, that thinking activities which stretch the individual's abilities will produce "translation" difficulties proportional to the subtlety and complexity of the thinking involved. Second, the full significance of the products of thought will not be available either to the individual or to those with whom he communicates until some sort of internal dialogue has been effected.

That is to say, the "aha!" response denotes full orchestration of the tacit and explicit representations of a thinking activity. Thinking leads both into effective action and into effective communication when the tacit and the explicit augment one another; thus mathematics and speech will call certain functional areas into play in the right hemisphere, and drawing requires left hemispheric activity.

Polanyi has argued that the scientist may mistake "the articulate contents of science" for the whole. What has been suggested here is that there is an equal danger that the artist may become lost in thrall in his tacit consciousness. When

art is more than a pastime it enters the world of ideas; and science demands, as Michael Polanyi so insistently reminded us, the exercise of "unspecifiable art".

CONCLUSION

We have examined thinking processes with reference both to the theory of tacit knowing and a model of brain function. What emerges is support for an idea which has long been informally held in art educational circles. Namely, that our mental structure demands that we maintain a separation between our "propositional" and "tacit" consciousnesses.

Western industrial culture identifies consciousness with verbal and analytical skills. Art education meanwhile holds itself warily aloof from the mainstream of intellectual activity, with a consequent polarization of views on its progress: a few advocating an art curriculum made up of propositional knowledge and objectively specifiable skills; the majority finding themselves entrenched in resistance.

Hence there is an impoverishment of debate in art educational circles. The tendency has been to organize studies on the assumption that fine art is the expression of a form of intelligence which is not only peculiar to the artist, but also virtually inaccessible to anyone who does not spontaneously manifest it. Implicit in this assumption is an answer to the question posed in the introduction: i.e. that we are dealing with a knowledge which is peculiar to fine art; which is (in a sense) primitive; and to which rational linguistic thought is inimical. It is hardly surprising therefore to learn that: "Techniques of establishing relationships" could become "the essential content of a studio course that has little or no programmatic content", or that "At their worst, art departments can confirm emotional dependencies, and . . . sanction distrust of criticism and analysis" (Goldin, 1973). We see a reluctance to see the aesthetic experience deprived of its simplicity; an aversion to *sophistication* (cf Hamilton & Cairns, 1961). The assumption is that we should shield the artist from the demands of an educational system shaped to meet industrial society's appetite for objective knowledge. Examples of the tone adopted by the apologists for art education are to be found in Brighton & Morris (1977), Heron (1971), and Coniam (1980); the art educational community, with its defensive posture, is likened by Peter Fuller (1980) to a reservation for an endangered species.

We have seen that there is some basis for this distrust of verbal analysis. Further, the well-documented case of Nadia, a child whose verbal deficiency was accompanied by extreme precocity in drawing, suggests that the restraint of the one accelerated development of the other (Selfe, 1977). Evidence also exists to suggest that temporary restraint may assist some undergraduates to exercise powers of tacit consciousness (Cornock, 1984b).

But *there is a tendency to claim too many privileges for tacit consciousness*: that is, to demand insufficient effort on the part of the student to describe and interpret what he is doing, both to himself and to others; and to give too little value to the critical exploration of his results. If the student is to develop his full

knowing power he must be able to conceptualize the products of his tacit consciousness so that his visual forms can be organized to reflect his whole self, and communicated effectively. Whilst it is true that the exercise of tacit consciousness will be disrupted by the intrusion of the rational-linguistic mode of thought, it is equally true that activities pursued entirely in the tacit mode will become aimless and repetitive; there is a dynamic balance to be struck between the tacit and articulate components of the student's knowing power.

What has been argued is that we should treat the visual arts as a field of study demanding *both* forms of knowing associated with learning. Fine art studies do make special demands and do create an unusual balance of consciousness; but it is both dangerous and misleading to characterize the knowing involved as either peculiar or primitive.

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may be important to place a greater and earlier emphasis upon the acquisition of more appropriate means of expression for the concepts contained in this mode (Balchin, 1972).

Many artists and designers, especially those working in the field of education, are therefore developing a legitimate interest in neuroscience. It seems to me that one of the reasons for this is that the brain is a complex system which is capable of offering a rationale for many cognitive processes which it is difficult to describe in terms of logical and verbal thought. For this reason, the development of the brain in art and design is a subject of increasing interest.

A RATIONAL APPROACH TO DESIGN

The brain is a complex system which is capable of offering a rationale for many cognitive processes which it is difficult to describe in terms of logical and verbal thought. For this reason, the development of the brain in art and design is a subject of increasing interest. The brain is a complex system which is capable of offering a rationale for many cognitive processes which it is difficult to describe in terms of logical and verbal thought. For this reason, the development of the brain in art and design is a subject of increasing interest. The brain is a complex system which is capable of offering a rationale for many cognitive processes which it is difficult to describe in terms of logical and verbal thought. For this reason, the development of the brain in art and design is a subject of increasing interest.

Does this mean therefore that the processes of acquiring verbal and non-verbal (numerical and non-numerical) information must be mutually antagonistic?

There is clearly an ill explained relationship between the processes of acquiring verbal and non-verbal information. Can they be taught alongside each other, or must one become established before learning the other can be established? This is a question which is being asked by many people who are interested in the development of the brain in art and design.