REASONED POSSIBILITY:
THE ROLE OF IMAGINATIVE THINKING IN EDUCATION
WITH PARTICULAR REFERENCE TO
THE 15-18 YEAR OLD LEARNER

by

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Reasoned Possibility:

The Role of Imaginative Thinking in Education

with Particular Reference to the 15-18 Year Old Learner

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ABSTRACT

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The Role of Imaginative Thinking in Education with Particular Reference to the 15-18 Year Old Learner

Imagination is recognized as a distinct and unique feature of the human intellect, but its role in education remains rather unclear. This thesis examines the concept of imagination, and clarifies definitions of imagination and imaginative thinking which have justifiable educational value, and from which practical applications might be drawn for classroom practice. From an examination of historical and current conceptions of imagination, and an analysis of terms, "imagination" is defined as a capacity to think of possibility, and "imaginative thinking" as the generation of refined, disciplined, and reasoned possibilities. It is claimed that thinking imaginatively plays a role in a wide range of intellectual activities including hypothesizing, interpreting, empathizing, judging, planning, creating, inferring and evaluating, that it is fundamental to most intelligent thought, and that it has applicability to all curriculum areas at all levels throughout the school. It is asserted that the capacity and the disposition to think imaginatively are consistent with educational ideals of an independent and critical intellect, and that they should be explicitly and consciously developed in classrooms.

The thesis then describes the intellectual and imaginative characteristics and interests of adolescents. It discusses conditions which might support students' imaginative thinking, and a planning structure is proposed to guide teachers' decisions about how learners' imaginations might be engaged. The planning structure is exemplified in brief sample lessons, and general guidelines about the elements or topics which might engage the intellectual and imaginative interests of 15-18 year old students are discussed. Implications for the nature and the structure of the education and professional preparation of teachers are then explored.

DEDICATION

This work is dedicated to my parents, Reginald and Beatrice Jones, for their unfailing support of this, and the many other challenges I have undertaken, and the choices I have made.

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Chapter 1

THE NATURE OF THE INQUIRY

In *The Necessary Angel*, the poet Wallace Stevens states that, "The imagination is one of the great human powers ... it is the liberty of the mind" (1951, p. 138), and he notes that Pascal once commented that it is imagination that creates beauty, justice and happiness (ibid, p. 135). Without the capacity to imagine, suggests Israel Scheffler, "we would be forever captives of the past" (1991, p. 130), bound by actualities, unable to see beyond "what is". This unique human impulse to "transcend what exists in the direction of what might exist" (Kearney, 1988, p. 42), and to create new conceptions can be seen in art and architecture, in poetry and literature, in the visions of great leaders and explorers, in feats of science and engineering, and in ingenious solutions to everyday problems. We recognize the imaginative spirit in the ideas of Plato, Copernicus, Ghandi, Einstein, Mozart, and Wordsworth, in the myths of ancient cultures, and in the play of young children. Imagination is acknowledged as a distinctive and unique feature of human intelligence, one that sets us apart from other forms of sentient life. However, while there is a

tacit acknowledgment of the unique nature of the imagination, and a general feeling that it should be encouraged in schools, it receives relatively little attention from educators. Its role in education remains rather unclear, and its serious involvement in education is restricted largely to the literary, creative and performing arts.

Israel Scheffler states, however, that, "nothing is more important in education than finding ways to cultivate the imagination, the power to negate actualities in thought and leave pious pedantry behind" (1991, p. 130). Barrow argues that, "an educated person, as distinct from a well-trained or an indoctrinated person, must necessarily possess imagination" (1988, p. 89). Imagination enables the individual to look beyond the actual, and to know what alternatives might exist beyond the here and now, and it enables him or her to consider alternatives to conventional ideas. Being educated, rather than simply being technically competent and passively compliant, implies that an individual has both the ability and the disposition to independently apply criteria for truth or validity, to critically assess others' views, to detect illusion and expose fallacy, and to imagine alternatives.

Maxine Greene also claims that imagination is "essential to the feeling that life is more than a futile, repetitive, consuming exercise" (1988, p. 48). She suggests that a lack of imagination condemns the individual to a life of both intellectual and social confinement, and a mute acceptance of the

"imposition of a predefined conception of 'the given'" (ibid, p. 45). Uncritical acceptance of "the given" maintains the status quo, and it establishes conditions in which ignorance, exploitation and manipulation can flourish. "Imagination is to be prized, " states Hanson, "because of its link to freedom" (1988, p. 139). Full and active participation in society, she suggests, requires individuals to be aware of both the realities and the possibilities of the society in which they live. Without imagination they cannot have a vision of a better existence or of a better world, and without knowledge of possibilities, individuals and cultures are not excited to effect change, to improve, to advance (ibid, p. 138). Imagination, states, Stevens, "is the irrepressible revolutionist" (1951, p. 152).

Imagination has been linked to discovery, innovation and invention in all fields and disciplines, most typically in the arts and humanities, but also in science, and in other fields commonly less associated with imaginative creativity. The knowledge and understanding of the culture is, therefore, furthered and expanded by individuals' imaginative and creative ideas. The complexity and the diversity of human experience is explored and expressed in artistic and literary works. The ability to imagine others' points of view, and interpret and empathize with others' beliefs and experiences forms the foundation of humanistic understanding. Imagination, therefore, is also to be prized, and to be nurtured, because of its role in the generation of

knowledge, its role in personal and humanistic understanding, and its function in artistic expression.

There are also more specific claims supporting a place for imagination in education. Egan states, for example, that "the imagination should more properly be seen as one of our major tools in the pursuit of objective knowledge" (1992, p. 59). The human mind, it is thought, does not simply apprehend some external, objective reality, but actively "constructs" or "constitutes" an interpretation of the world (Bruner, 1986). Learning, therefore, is not simply a process of acquiring pre-ordered and structured knowledge, but requires the individual to structure knowledge from experiences. "The world of appearance," states Bruner, "the very world we live in, is 'created' by mind" (ibid, p. 96).

In *Imagination and Education,* Egan and Nadaner (1988) suggest that, contrary to the rather commonly held view that imagination is some desirable but dispensable frill, imagination is,

> the heart of any truly educational experience; it is not something split off from "the basics" or disciplined thought or rational inquiry, but is the quality that can give them life and meaning; it is not something belonging properly to the arts, but is central to all areas of the curriculum; it is not something to ornament our recreational hours, but is the hard pragmatic centre of all effective human thinking
>
> 1988, p .ix

Any full account of the human intellect includes the capacity to imagine, and one might suggest that a comprehensive education should endeavor to

develop the imagination along with the individual's other intellectual capabilities. Mary Warnock, indeed, states, "if we think of imagination as part of human intelligence, then we must be willing to admit that, like the rest of human intelligence, it needs educating" (1976, p. 202).

This point of view, however, is clearly not widely held. Maxine Greene notes that, "in the recent proliferation of reports on education and calls for reform there has been little or no mention of imagination" (1988, p. 45). A number of factors may account for what Sutton-Smith has called the "meager influence" of imagination in education (1988, p. 3). The complex nature of imagination itself, and the broad range of meanings that the term "imagination" connotes, makes it difficult to derive a clear, unambiguous sense of the role it might play in education. Associations that accompany many of those meanings often promote the view that imagining is simply frivolous and self indulgent, that it lacks intellectual rigor, and encourages subjective relativism. Egan and Nadaner (1988) also suggest that current educational practice is influenced by conceptions of education, of teaching, and of learning that do not recognize imagination as having any serious educational value. This thesis, therefore, is in response to the need to clarify a conception of imagination which has justifiable educational validity, and to suggest a methodology which has practical applicability in the classroom.

In his book, *Imagination in Teaching and Learning*, Egan notes that one of the major impediments to clarifying a place for imagination in education is that, "it is very difficult to get a grasp on what imagination is" (1992, p. 1), and that, "people, even those who are most intimately involved in studying it and promoting its value in education, mean rather different things by the term" (ibid, p. 2). Warnock, for example, claims that, "imagination ... is involved in all perception of the world, in that it is that element of perception which makes what we see and hear meaningful to us" (1976, p. 152). Scheffler, however, suggests that imagination carries out a somewhat different function in that it, "negates what is and ponders what might be" (1991, p. 130). Rugg states that imagination is "the magical force that forms the bits and pieces from mind" (1963, p. 288), yet Barrow claims that there is, in fact, no such distinct thing as imagination, only the capacity to conceive of the "unusual and effective in particular contexts" (1988, p. 84). These varying uses of the term and different interpretations of the nature of imagination reflect the complexity of this "magical faculty of the soul" (Hume, 1978, p. 16), and also illustrate its long, complex, and diverse history. Each past theory of imagination, suggests Brann (1991), has contributed some element to our understanding of imagination.

Since references to the imagination appeared in Biblical accounts and early Hellenic myths, the history of imagination has been a chronicle of social

and ideological change. "Imagination", states Sutton-Smith, "is a concept whose history is filled with contradictions" (1988, p. 27), and its story has been characterized by both continuity and variation (Kearney, 1988, p. 17). Current views still reflect a broad range of ideas derived from, or in contradictions to, preceding accounts. Warnock's views, for example, have been drawn largely from the ideas of Kant and Hume which define imagination as the faculty which synthesizes all experiences into understandings. Ryle's and Barrow's conceptions of imagination, however, refute previous assumptions that imagination exists as a faculty. They define imagining as a particular way of thinking about things.

"Our current view of imagination is a patchwork of historically derived textures", suggests Sutton-Smith (1988, p. 3). Although many of the past interpretations of imagination have been abandoned, vestiges of past accounts still influence current views - the strong association of imagination with visual images is one such example. People, therefore, may mean rather different things by the term imagination, and each view may reflect distinctly different underlying suppositions. It is important to know in what sense the term "imagination" is being used, and what underlying ideological or philosophical position that it presupposes, to be able to define the value of imagination, and to be definitive about the role it might take in educational practice. The assumption that using imagination merely involves the having

of visual images, for example, would obviously mean something rather different in educational practice from a supposition that it is imagination which enables an individual to think, not simply of "what is", but of "what is possible".

There is not only a significant degree of discrepancy among varying interpretations of imagination, but there is also a certain vagueness about the distinctions between imagination and other, somewhat related, terms. Sutton-Smith notes that, "Our culture conflates together play, the imagination, daydreams, reveries, and so forth" (1988, p. 23), and this both obscures and trivializes the significance of the imagination. Imagination, he suggests, "should be clearly differentiated from play and other forms of intelligent activity" (ibid, p. 27). Alan White (1990) claims that there are, in fact, distinct differences between imagining and activities such as pretending, visualizing, playing, fantasizing, and supposing, although imagining may well form part of such activities. Pretending to be a policemen, for example, does not necessarily involve imagination, it might merely involve mimicking or representing the actions of a policeman (White, 1990, p. 147). We must, therefore, not only be clear about what is meant by imagination, but also be clear about how it may differ from other associated functions, to be able to assess the appropriateness, or the value, of activities such as

pretending or playing, supposing, visualizing, daydreaming, or fantasizing, in exercising or developing the imagination.

The term "imagination" is, perhaps, most commonly associated with the term "creative" and with conceptions of creativity. Imagination, in fact, is frequently subsumed under the general rubric of creativity, or implicit in activities designed to promote creative thinking. We commonly use the terms "imaginative" and "creative", rather interchangeably, to describe the works of Mozart, to talk about ingenious solutions to ordinary problems, to describe young children's paintings, and so on. However, while it is clear that creative individuals may be also be highly imaginative, and that most creative ideas result from imaginative thinking, it is not clear that all ideas or products that might be described as creative have necessarily resulted from exercise of the imagination, or indeed that all imaginative ideas are necessarily creative in any objective sense. Imaginative thinking and creative thinking may be related, or similar in some important respects, but it appears that they are not necessarily synonymous. We, therefore, also need to clarify the relationship and the distinctions, if any, between creative and imaginative thinking, and between creative and imaginative ideas.

One further legacy of past views of imagination is the many and varied qualities that are associated with imagination and imaginative thinking and the values that those associations imply. The term is often associated with

"irrationality, mimicry and dissimulation ... childishness, freedom and uniqueness", states Sutton-Smith (1988, p. 3). Imagination is also frequently associated with fantasy and entertainment, with frivolity or triviality, or it may be associated almost exclusively with the production of artistic or literary works. While many of these views are related to conceptions of imagination which are founded on assumptions that may no longer have credence or currency, their influence still prevails. Many of these associations diminish the educational significance of imagination. Barrow notes that, "imagination has been tied in with various 'irrational' forms of thought which make "the place of imagination within the traditional conception of education rather vague and a topic of some discomfort" (1988, p. 91). Greene also states that,

> There seems to be a general association of imagination with the non cognitive, with the intuitive, or with the merely playful; and none of these are granted relevance for serious learning
>
> 1988, p. 45

In Chapter Two, therefore, I will examine the concept of "imagination" by reviewing the history of the term and tracing the views that have influenced and informed our current accounts. I will identify some of the more tenacious and common associations with imagination and with imaginative thinking, and examine their underlying suppositions. In Chapter Three, I will examine the terms "imagination", "imagining" and "imaginative thinking", and define them in terms which are educationally

valid and have some practical utility. I will consider the relationship between imagination and knowledge, and between imagination and reason, and I will establish that thinking imaginatively is informed, disciplined and rigorous. I will also clarify some critical distinctions between imagining and pretending, supposing, visualizing and creating. I will suggest a conception of imagination which defines imagination as a capacity to imagine, imagining as thinking of possibilities, and thinking imaginatively as refining possibilities into reasonable and workable conceptions.

Egan and Nadaner have suggested that "our education systems at present are profoundly influenced by conceptions of education that ignore or depreciate imagination" (1988, p. ix). This is, no doubt, related, to some extent, to the lack of conceptual clarity about what the term "imagination" actually means, which makes deriving clear practice rather difficult, and to the current associations of the imaginative with the irrational, the non cognitive, the trivial and the immature. There are other factors, however, that appear to diminish the value and the influence of imagination and imaginative thought in education. One of these is related to a view of rationality as largely " scientific in nature" (Eisner, 1979, p. 264), and the pervasive influence of theories of cognition and cognitive development which do not appear to include imagination in their conceptions of mature thought.

Bruner suggests that, "theories of development, by their stipulations about human growth, also create rules and institutions" (1986, p. 134). He states that,

> ..it is the nature of things that, once "findings" are accepted into the implicit knowledge that constitutes culture, once-scientific theories become as reality defining, prescriptive and canonical as the folk-psychological theories they replaced.
> 1986, p. 135

The developmental theory that has been the most influential in current educational practice, to the virtual exclusion of any others, is that of Jean Piaget. Piaget's model of cognitive development stipulates biologically determined and distinct stages through which children pass as they mature. The final stage of development, attained in early adulthood, is typically equated with the ability to engage in abstract thinking and formal operational thought, both associated largely with the exercise of hypothetical-deductive reasoning. The goal of increasing mastery and refinement of this form of thinking pervades curricula and influences teaching methods, and, as Cohen and MacKeith have stated,

> Piaget's theory remains the dominant theory of intellectual development: the child moves through well-oiled stages to being a logical human who can perform quadratic equations and scientific experiments according to the laws of logic
> 1991, p. 15

Eisner, however, suggests that "scientific assumptions and procedures do not exhaust the forms of knowledge and methods of inquiry that humans

give shape to the world" (1979, p. vii). The mature intellect is not simply characterized by the capacity to apply the rules of scientific inquiry. Hypothetical-deductive reasoning does not enable the individual to appreciate a poem or a sculpture, or debate the nature of complex concepts such as justice, irony, or love. These require insight, understanding, interpretation, empathy, and the ability to weigh the validity of various points of view. They involve the ability to understand what might be possible. They require imagination. Many accounts of scientific innovation suggest that imagination may also play a role in scientific inquiry, insight and discovery (Shepard, 1988). Nonetheless, the dominance of a singular view of cognition prevails, and the serious involvement of imagination in education is largely restricted to the arts, to "non-rational" enterprises.

At the turn of the century, Dewey suggested that limiting the role of the imagination to areas such as "fairy tales, myths, fanciful symbols" (1916, p. 236), and confining its place to subjects such as Fine Arts, and ignoring the role of imagination in other areas, " leads to methods which reduce much instruction to an unimaginative acquiring of specialized skill and amassing a load of information" (ibid, p. 236). Goodlad's (1984) observations indicated that this still, unfortunately, characterizes many students' school experiences, particularly at the secondary school. Aside from any concerns that we might have for the state of boredom that this might create in students, or "the

absolutely destructive effects on human beings and their curiosity, natural desire to learn, (and) confidence" (Montgomery School Alliance, 1973, p. 37), there are possibly even greater concerns. There is little doubt, states Simonton, that formal education, as it is currently structured, "can inculcate a certain conformity of thought, even rigidity that can hamper innovation"(1987, p. 69). Shepard also suggests that,

> individuals who adapt well to the mastery of conventional school subjects and to working with others within an established organization seem less likely to question accepted ideas or break new paths
>
> 1988, p. 182

It appears that the structures and practices of public schooling, as they currently exist, may not be very successful in graduating individuals who can use their imaginations to, "negate actualities in thought and leave pious pedantry behind" (Scheffler, 1991, p. 130). Indeed the degree of acquiescence to conventional views that current systems of education appear to promote in students might be viewed as perilously close to a subtle form of indoctrination, or at least, as developing a troubling degree of intellectual compliance and passivity among their students.

The position argued by Scheffler, Greene and others, that imagination should play a central role in education, rests on the assumption that the capacity to imagine, however that is defined, is a universal attribute, that all individuals at all stages can, to some extent, use imagination in ways that are

educationally worthwhile. If imagining is thinking of things as possibly being so, then it certainly appears that this activity is not simply the purview of the "gifted" or the particularly creative, although it certainly seems likely that individuals will vary with respect to their innate ability to imagine, and that some individuals may be capable of thinking of far more imaginative ideas than others.

It is generally agreed, states Brann, "that imagination is the domain of children (1991, p. 291), and there is a fairly rich body of literature describing young children's imagery and their fantasy lives (Piaget, 1962, 1971, 1977), their make-believe, and their imaginary companions (Somers and Yawkey, 1984). However, we have relatively few descriptions of the imaginative lives of typical older students. The role that imagination might play in their education is even less clear. As previously suggested, accounts of cognition in older students are rather dominated by the view that individuals become more logical, more deductive, and more "rational", and perhaps by inference, less imaginative, as they attain intellectual maturity. John Barell's observations in secondary classrooms, however, suggest that imaginative activity in adolescents may take different forms from those that it takes in their younger counterparts, but that it may be just as dynamic and effective. The mind, suggests Barell, is,

> " a quintessential playground within which we play an infinite variety of roles, enact myriad possibilities of action, resolve

> scores of problems, toy with ideas, and learn to take control of our lives"
>
> 1980, p. 3.

Imagination may not be the sole prerogative of the "gifted" or the young.

In Chapter Four, therefore, I will consider the role that imagination might play in the education of the 15-18 year old. I will review the dominant theories of adolescent cognition, those of Piaget and Erikson, and other theories or ideas related to, or derived from them. I will also consider the personal and imaginative lives of individuals at this stage to generate a somewhat more inclusive account of how 15-18 year old students think, and what motivates and captivates their imaginative energy. I will discuss the role and the value of imaginative thinking in the education of students at this age, and consider what specific characteristics and needs of individuals at this age should be considered in the type of activities the teacher might plan.

There is relatively little in current educational literature to establish a clear role for imagination in learning, or to suggest unambiguous and practical ways of promoting imagination in the classroom except in subjects such as art, drama, or creative writing where the aim of a lesson may be to produce a unique, creative, or expressive work. Teaching that engages students imaginatively in subjects or domains other than the arts has tended to be regarded as rather idiosyncratic, and dependent largely on the ingenuity of the teacher in organizing and presenting topics in an imaginative fashion, and crafting student inquiry in unique or unusual ways, rather than being

guided by any clearly defined principles. Furthermore, the traditional model of the teacher as disseminator of authoritative views, the focus on developing disciplined knowledge, and the common model of planning lessons to achieve singular predetermined outcomes, leave little room for the independence, exploration and varied interpretations that are generally associated with imaginative thinking.

In Chapter Five, therefore, I will consider the place of imaginative thinking in the classroom. I will consider strategies the teacher may use to encourage students to use their imaginations and to think imaginatively, and I will discuss some of the conditions which might support imaginative thinking in classrooms. From this I will derive an approach to planning which incorporates elements associated with imaginative thinking into a planning structure. I will then provide some brief examples of lessons which may encourage imaginative thinking, and discuss the particular considerations a teacher might make in incorporating imaginative thinking into the secondary school classroom.

In Chapter Six, I will review the implications that might be drawn from this thesis, and I will suggest further philosophical and empirical inquiries which might confirm a more emphatic role for imagination in teaching and in education. Finally, I will consider the implications of this thesis for the preparation of new teachers in response to Eisner's claim that,

"alternate views of knowledge and mind have been omitted in the preparation of teachers" (1979, p. 264), and Rugg's suggestion that "nothing less than a revolution in the education of teachers" (1963, p. 310) is needed to change teaching practices to utilize and develop the intellectual capabilities of the whole person.

Chapter 2

IMAGINATION

a brief history of conceptions of imagination

> Might we say of imagination what Augustine once said of time - we think we know what it is but when asked we realize we don't. Of course we all know - each one of us - *something* about imagination. It is the wager of philosophy, however that we may come to know more about it (the imagination) by asking questions of it.
>
> Kearney, 1991, p. 1

Kearney states that, "since the beginning, imagination has been acknowledged as one of the most fundamental, if concealed powers of mankind" (1991, p. 1). Although its role in everyday existence is recognized and acknowledged and the term is in common use, a clear, precise and comprehensive definition of the term "imagination" is elusive. Within the Western intellectual tradition the term "imagination" has carried a number of connotations, and over time the term has been used to describe a broad and varying range of intellectual and creative capabilities. This reflects the complexity of this unique element of human intelligence, the capacity that

Kant has called, this "hidden art in the depth of the human soul" (1786, p. 181), and indicates a number of differences in assumptions about man, knowledge, and being underlying these diverse and varied conceptions.

The mysterious and somewhat maverick nature of imagination has intrigued and puzzled people since ancient times. It has been described in many ways ranging from being evil and idolatrous, to being the most noble of man's intellectual capabilities. Common to many accounts from ancient to modern times is the sense of imagination being the source of people's capacity to form mental images of what is not actually present, and the ability to think of something as possibly being so - the representational (reproductive) and creative (productive) functions of imagination. There have, however, been distinct variations in interpretations of the source of these abilities and the nature of the imagination at different times and in different historical periods. Conceptions of imagination have been influenced by changing philosophical, ideological and cultural forces, and the history of imagination traces not only the thread of ideas that connects current ideas with those that preceded them, but also the history of the major intellectual phases of Western culture from the ancient and classical world to post modernism.

Kearney points out, however, that the development of ideas about imagination proceeded not simply as an unbroken and cumulative chain of

thought but also reflected significant paradigmatic shifts in underlying epistemological or etiological assumptions and mutations in ideas about the nature and the functions of the imagination. Williams has also pointed out that the meanings of words do not remain constant over time. The "structures of particular social orders and the processes of social and historical change" (1985, p. 22) alter both the meanings that are attached to a term and the ways in which the term is used. Eva Brann suggests that few theories from past eras have been permanently abandoned, and she suggests that each theory of imagination has contributed some understanding of imagination to our current view. I will, therefore, trace the history of conceptions of imagination in the Western culture from ancient to modern times focusing not only on the various terms that have been used to describe the imagination, but identifying major formative influences and significant shifts and changes in the ways imagination has been viewed and defined. In that sense my account is genealogical rather than strictly chronological, selective rather than inclusive. I will identify some general features of those formative contexts and some major or recurring themes that may have contributed to the broad range of current views of imagination.

I will limit my account to the history of Western thought although I recognize and acknowledge the richness and variety of interpretations of imagination in other cultures and in other intellectual traditions. This is

largely because current Western understandings of imagination, both those in common use and those in current philosophical accounts, have been influenced and shaped by ideological and intellectual influences in the history of the Western world. It is also because my later discussion of the role that imagination might play in the classroom will be limited to education and teaching within the Western Canadian context, a setting both informed and governed by Western conceptions and values.

Shifts or developments in theories of imagination can be traced largely through the study of theological writings and philosophical treatises. These particular sources, however, do not necessarily reflect the vital and dynamic role that imagination has played in everyday "folk" or popular culture throughout time. As noted by White (1990), there is frequently a vast difference between the ways in which philosophers have described imagination and the role the imagination has played in everyday experience. The profane imagination and the creativity of popular culture has not necessarily been reflected in the thinking of "high culture" representative of a particular age. Philosophical interpretations of imagination have differed throughout time, reflecting the particular influences of the intellectual and ideological context, but the role that imagination has played in the daily lives of people may, it has been suggested, have changed remarkably little. My

review will, however, be limited to a description of the intellectual and philosophical treatments of imagination in Western cultural history.

IMAGINATION IN THE ANCIENT WORLD

The preliterate imagination

Tangible evidence of the imaginative activity of preliterate people exists in the form of ancient technologies, inventions, architecture and works of art, but preliterate societies provided no direct philosophical accounts of imagination. It is believed, however, that the authoritative or sacred beliefs and ideologies of these cultures are reflected in many of their myths. Lévi Strauss, in *The Naked Man*, (1981), claims that myths,

> teach us a great deal about the societies from which they originate, they help us lay bare their inner workings and clarify the *raison d'être* of beliefs, customs ... and most importantly, they make it possible to discover operational modes of the human mind which have remained so constant over centuries and so widespread
>
> Cited in Strenski, 1987, p. 132

The sacred myths of preliterate cultures had spiritual significance and told stories about omnipotent gods and superhuman heroes. Myths narrated the cumulative experience of the culture and passed on that accumulated wisdom to future generations. They conveyed the deep insights acquired by the people and passed on the laws of the tribe, dictating the social codes, the mores and behaviors of the people. Some myths explained the origins of

cyclical and recurring natural events. Most myths were associated with magic and sacred ritual.

Studies of the few remaining contemporary preliterate cultures suggest that myths are not considered by the people of a preliterate tribe to be simply figments of the human imagination and they are clearly separated from "false tales" and fables, which are. While recounted by people, myths are believed to be divine in origin. Genuine myths, states Brann, are "not fictitious feignings of the imagination, but have the gravity of recollected fact" (1991, p. 546). To the nineteenth century positivistic mind, however, myths suggested a naiveté and irrationality associated with the fanciful stories of young children or the simple minded. Vico (1725) suggests that myths are indicative of "imaginative universals", a poetic type of understanding which is characteristic of primitives of all kinds - savages, peasants, and children, and that these differed from the "intelligible universals" which characterize later and more sophisticated stages of cognitive functioning (cited in Brann, 1991, p. 551). In *Myth and Ritual,* however, Lord Raglan (1855), disagrees with this position,

> Those who regard myths as the products of the imagination have clearly not understood how the imagination works ... The kind of imagination which the myth-maker is, according to some, supposed to have possessed is in fact something which nobody has ever possessed
>
> Cited in Brann, 1991, p. 550

Lévi-Strauss suggests that, although myths appear to be naive, simplistic, and often irrational attempts to understand and explain the world, the human mind has changed little over time. He states that "the kind of logic in mythical thought is as rigorous as modern science, and ... the difference lies, not in the quality of the intellectual process, but in the nature of things to which it is applied" (1963, p. 230). Goody also claims that preliterate people did not have a differently constituted, more primitive, imaginative mind and were marked not so much by the absence of rational and reflective thinking as by the lack of proper tools for "collective rumination" - texts. Ong (1982) suggests that the emergence of writing and the move from an oral to a text-based authority resulted in changes in the accumulation of knowledge and in the intellectual processes of inquiry. This, he suggests, reshapes both the form in which knowledge is acquired and transmitted, and also fundamentally reshapes human cognitive processes. Ong's theory implies that the intellectual lives of literate and preliterate peoples were different and that imagination may have played a very different and significant role in preliterate cultures. Vico, however, suggests that literate minds will simply not understand the mythic mind because of fundamental differences in the bases of belief of literate and preliterate peoples.

These various views imply that a direct interpretation of the preliterate imagination through a study of myth may be impossible or tentative at best and that generalizations about the imaginative nature of the preliterate mind are necessarily inadequate. Interpretations of the generative nature of the preliterate imagination and claims about imaginative abilities that may have been lost with the emergence of writing also seem speculative. The study of oral cultures and the role of myth, story and the imagination in ensuring the continuation of their cultural traditions does, however, enable us to make more substantial claims about the relationship between the imagination, and the emotions and the memorization of information.

Many myths and sacred stories conveyed and ensured the memorability of the important spiritual, historical, social, and practical information of a preliterate culture, and provided the means for this information to be remembered, recalled and retold. The language of most myths tends to be rich in linguistic structures and devices which engage the imagination and the emotions, facilitate memorization, and encourage active involvement. Predictable story structures, vivid images, and supernatural characters engage the listener affectively as well as intellectually and, as pointed out by Egan, "recent research has confirmed what myth users knew long ago - that we can remember a set of vivid events plotted into a story much better than we can remember lists or sets of explicit instructions," (1992,

p. 11). Memorization of important cultural knowledge was facilitated by both the intellectual and strongly affective engagement of the imagination. This association of imagination, emotion and memory is still recognized in mnemonic strategies which utilize the strong power of images.

Notwithstanding the range of contradictory accounts of the preliterate mind, the idea that human beings are primevally characterized by imagination, rather than reason, has left its mark on later conceptions of imagination and given rise to some common associations of imagination with irrationality, untruth and intellectual immaturity. The common use of the word "myth" to describe a "fictitious story or unscientific account, theory, belief etc." (Webster, 1988) is a further product of this association and suggests a juxtaposition of imaginative and scientific or rational thought - a dichotomy that is furthered in the views of Plato and can be traced throughout the history of Western thought.

Interpretations of the preliterate era provide an understanding of the relationship between the imagination and the affect, and imagination and memory. Myths also demonstrate a clear belief of preliterate cultures in deities and the controlling influence of gods in human affairs. This is a theocentric and objective view of the world that accompanies conceptions of imagination as the account of imagination moves from the mythic to the historical era. Interpretations of the products of the preliterate mind,

however, raise a number of interesting questions such as: Is the imaginative mode different from the reasoning mode? Does the imaginative mode precede rationality and suggest a theory of mental stages? Are there imaginative capacities that humans have lost with the dominance of the linear rationality imposed by the demands of textuality? These questions, however, are beyond the scope of this particular inquiry at this time.

The Biblical imagination

During the time of King Solomon the scattered and largely oral tradition of tribal Israel began to be shaped into a literary tradition, and the myths, stories, tales, laws and teachings began to be collected and compiled into the accounts in the Old Testament. In Biblical stories the birth of imagination coincides with the beginning of human history. The Adamic myth narrates the origin of the human power to imagine in the act of transgression when Adam and Eve ate the forbidden fruit of the Tree of Knowledge in the Garden of Eden. They became like God "knowing good and evil" (Genesis, 3,5). The story of the Fall from Grace marks the genesis of man's ability to think in terms of opposites - good and evil, present and past, and to imagine a world of his own, a world of limitless possibilities. The Tower of Babel, symbol of man's creative impertinence, challenged divine power. Realizing that "nothing will be restrained from them which they

have imagined to do" (Genesis: 11,6), God scattered the people and confounded their language in an attempt to diminish the creative power they had acquired with the ability to imagine.

While the Hebrew word "yetser" meaning imagination is etymologically linked to yotser (creator) and yatsar (create), interpretations of imagination within the Biblical tradition are largely focused on the ethical choices it enables man to make in the use of its creative power. Imagination enables man to know both good and evil and to exercise choice between the two. In *You Shall be as Gods,* Jewish scholar Eric Fromm explains,

> man can become more evil or more good because he feeds his imagination with thoughts of evil of good. They grow precisely because of that human quality - imagination
>
> Cited in Kearney, 1988, p. 40

Technically imagination itself was neither good nor evil, and man was free to make ethical choices and direct his creative imagination toward making an initial evil into an ultimate good - that is to imitate divine goodness and achieve redemption of sin. Nonetheless, the dominant view of imagination in both Talmudic and later Christian interpretations was that imagination was incorrigibly wicked (Kearney, 1988, p. 43). Within the Jewish tradition imagination was suspect because it permitted a deviation from divine reality in a search for the possible, and fictitious imaginings necessarily imply a denial of good. The Christian teachings regarded imagination as evil, a

consequence of the original sin - a sin transmitted to all subsequent generations.

Belief in God as creator, father, and judge of man lead to the belief that imaginative or creative abilities shown by people, such as the wisdom of Solomon, were considered to be gifts of God, not capabilities of the individual human mind. While imagination enabled people to exercise choice, conceptions of imagination in the Biblical world were inextricably linked with notions of the supreme power of the divine creator. Imagination enabled people to imagine and choose from alternatives, but it was limited in as much as the choices were largely ethical, the options simply to chose those thoughts and behaviors that would achieve reconciliation with God, or to succumb to evil and "fall victim to its own idolatrous creations" (Kearney, 1988, p. 43).

Biblical accounts of imagination and the theological interpretations of those accounts were major formative influences in later conceptions of imagination in the Western intellectual tradition. Indeed, the Western concept of free will likely has its own genesis in Biblical interpretations of imagination. These early accounts, however, clearly reflect the belief that imagination was a usurped power, and this view that imagination existed in relation to some divine or metaphysical power is a theme that is repeated in later conceptions of imagination. The error of transgression and the sin of

rebellion against divine power, the strong associations with evil, and the power of the imagination to lure people away from the good, the divine, remained as central and influential themes in later Christian views of the imagination.

Early Hellenic Imagination

There are distinct parallels between the Adamic myth of the Biblical tradition and the Promethean myth of early Greece. Within the Hellenic tradition the origins of the human ability to imagine are told in the story of Prometheus who brought man the power to control his world by his theft of fire from the gods. This myth contains elements very similar to Biblical accounts of the acquisition of knowledge of Good and Evil. Prometheus' theft of fire, like the theft of the apple of the Tree of Knowledge, was an act of rebellion against the divine. A rebellion that marked the inception of the ability of humanity to imagine, and therefore invent and control its own world.

Early Greek conceptions of imagination were similar to Biblical accounts with respect to the basic belief that the ability to be creative that imagination provided was a usurped divine attribute, and not part of man's original nature. However, in one respect the accounts were significantly and importantly different. In Biblical accounts imagination provided man with

the ability to make ethical choices to atone for his original sin. Early Hellenic conceptions regarded imagination as providing man with the ability to make, what might be described as, cognitive rather than ethical choices. Man's imaginative capabilities were not limited by a perpetual search for the "good" to achieve reconciliation with a singular divine power, but rather were able to play freely with the intellectual capabilities that imagination provided.

Arising from somewhat similar myths, the Adamic myth and the Promethean myth, two very distinct strands of thought about imagination emerged from the ancient world. Together they form the two major formative influences in subsequent thought about imagination, its role and its value. On the one hand there was the monotheistic Biblical tradition with its limiting prescriptive authoritative teachings, and on the other, the early Hellenic and later Greek tradition of rational inquiry. Biblical interpretations of imagination and its relationship to divine power were reflected in later theological thought. Early Hellenic interpretations of imagination moved conceptions of imagination into a more anthropocentric direction.

Imagination in the classical world - Greece

Unencumbered by a unified religion or belief in one supreme god, and believing that the problems of human existence required human rather than divine solutions, man's intellect in classical Greece was free to explore the

nature of man and his world. The pre-Socratic schools that emerged in the sixth century BC laid the foundations for the other major formative influence on Western conceptions of imagination - rational philosophy, and it was in classical Greece that imagination received its first fully philosophical formulation.

Greece during the Classical age was a time of unprecedented artistic and intellectual achievement. Underlying much of this achievement was a fundamental belief that reason and order could triumph over the chaos of the natural world and create a balanced society. Human intellectual capabilities and human creative potential were recognized and praised by the Greeks, and it was within this context that the three greatest Greek philosophers, Socrates (469-399 BC), Plato (428-347 BC), and Aristotle (384-322 BC), heavily influenced by beliefs in reason and order, challenged the fragmented and mythical religious beliefs and developed more systematic methods for inquiring into the nature of man and his ideas.

Plato's ideas about imagination were drawn from the intellectual ideals derived from his Theory of Forms and his views about the acquisition of knowledge and understanding of these forms. The separation of the Intelligible World from The World of Appearances in his diagrammatic simile of the Divided Line established an epistemological opposition between reason and imagination and created a dichotomy between the products of the

imagination and true knowledge that is still very much evident in thinking today. Plato divided the world into the intelligible world of forms (knowledge of the supreme good) and mathematical objects, and the world of appearances, visible things and images. Corresponding to these four divisions were "these four states of mind: intelligence for the highest, thinking for the second, belief for the third, and for the last imagining" (Cornford, 1968, p. 226).

Reason, asserts Plato, is the only way to contemplate truth, and imagination is only capable of imitation. Only by rejecting images and illusions can the mind aspire to the highest and most divine form of being. The Allegory of the Cave illustrates that only those who free themselves from conventional opinion and "shadows of artificial objects" and pursue reason can aspire to the truth. This represents Plato's belief that it is the ability to distinguish images as poor copies of the original that marks man's progress from *eikasia* (imagination as illusion) to *episteme* (correct vision of knowledge). Reason alone permits the development of knowledge and understanding, and all acts of imagination, he believed, present false images that lead the mind away from truth and knowledge of the Good, the highest form of knowledge.

Plato's dismissal of imagination as a deceptive element in the pursuit of truth, also caused him to reject artistic and poetic expressions of

imagination. These, he believed, not only lead the mind from reason but threatened to strengthen the lower elements of the mind. Not only did artists and poets present only the appearance of an object many times removed from reality, deceiving "children or simple people" into believing that they knew more than they did, but these works contributed nothing to society. Indeed they confused the mind by creating images far removed from reality, enticed people into idolatry, and threatened to make men slaves of emotion and irrationality. Imagination was capable only of mimicry, it presented barriers to the attainment of truth and it encouraged baser elements of human behavior and thought. While Plato saw no value of imagination, in rare instances he was given to concede that "thought images" could be of use in developing concepts by figurative or visual representations of more abstract ideas. Plato himself, indeed, used figurative, metaphorical and mythical elements in his own teachings. These were, however, means to achieving ends and of no value in and of themselves.

Aristotle, Plato's pupil, broke with some of Plato's doctrines to establish a philosophy that was to be equally influential in later eras. The fundamental and significant difference between the two philosophies concerned the nature of Forms and the acquisition of knowledge. Plato's Theory of Forms postulated that perfect Forms of the objects we see around us exist in a higher dimension of existence and knowledge of these true forms is

achieved through the exercise of reason. Aristotle, in contrast, believed that these forms were present in the objects that we see around us and did not exist as distinct and separate realities. Knowledge could, therefore, be gained from practical observation of real phenomena rather than contemplation of some transcendental other world.

This move from an idealist to a realistic epistemology placed imagination in a significantly different role. In contrast to Plato's belief that imagination prevented the acquisition of true knowledge, Aristotle believed that *phantasia,* loosely translated as "appearance or image", played a central role in achieving a knowledge of truth. Images mediated between the mind and its reasoning ability and phenomenal experience and sensation. Mental images, and Aristotle referred generally to direct visual representations of reality, were necessary for thought to occur. Indeed, Aristotle believed that reasoning could not occur without the mediation of these mental images.

Aristotle also recognized the active role of imagination in developing cognitive images (ideas) of things not actually, or yet, experienced. In *De Anima* 3,7 he states "..it is by means of the images or thought in the soul which enables us to see (the future) that we calculate and deliberate about the things future to things present" (cited in Kearney, 1988, p. 111). Aristotle made a distinction between the sensible imagination and the rational imagination and he recognized the ability of the imagination to both store

images in memory and to predict the outcome of actions. Aristotle believed that it is this rational imagination which sets mankind apart from the animal world, but although he acknowledged its synthetic function, Aristotle did not place imagination in the role of an autonomous function of the intellect. The imagination was very much the servant of reason, images and ideas were mere copies of the sensible world not original creations of the human intellect.

The two philosophers presented very different views of the imagination. Plato regarded imagination as a willful, subversive and illusionary element of the human soul presenting things as other than they are. Aristotle viewed imagination as a largely passive element of the mind playing a central role in thought by accurately portraying things as they actually are. Aristotle, unlike Plato, accepted the imaginative works of poets and artists as imitating reality rather than presenting illusions.

Aristotelian and Platonic philosophies presented two different views of truth and inquiry which continued to influence Western intellectual thought to the extent that Coleridge remarked that one is born either an Aristotelian or a Platonist (Cunningham, 1982, p. 181). Although both philosophers emphasized reason as the only way to attain knowledge, their views about imagination were vastly different yet equally influential. Both the Platonic dichotomy between reason and imagination, and the Aristotelian role for

imagination in the presentation to the intellect of mental images of the sensible world are views that influenced later thought. Both views, in common with the ancient accounts that preceded them, placed imagination simply in a reproductive role. To use Abram's (1958) analogy, imagination was a mirror of external reality. This dominance of belief in the purely mimetic function of imagination continued throughout the Classical and Medieval worlds.

Imagination in the classical world - Rome

The influence of Greek ideas can be seen in the Stoic, Epicurean and Neoplatonist schools of thought, and Roman philosophers concerned themselves principally with the nature of images and their relationship to thought. Quintilian in his book on the education of an orator states,

> What the Greeks called *phantasiai* we call visions *(imaginatio)*, through which the images of things absent are so represented in the mind that we seem to see them as present before the eyes. He who understands them well will have the most power over the feelings
>
> Cited in Brann, 1991, p. 469

In interpreting the role of images in thinking the Stoic philosophers provided some foundational ideas for the concept of subjectivity that appeared in later thought. The image of an object, it was believed, was impressed on the "soul" and the rational part of the soul derived meaning and knowledge from these images. In this sense the impression working

with the rational part of the soul, not the external object itself, established meaning. Chrysippus named the element of the soul that generated images the *phantason* and it was this that also generated the *phantasma* of dreams and hallucinations. The Stoic view described a relationship between external sensation and the rational mind which continued to characterize thought about imagination, but it also suggested a generative role of imagination in its ability to create rather than simply reflect knowledge. In this respect it is somewhat predictive of later views of subjectivity.

Lucretius (99 - 55 BC) was part of the Epicurean school. All being, he thought, was composed of atoms, and imagination was not an activity of the mind, but a state of invasion or irritation of the mind by filmy images. This simple materialistic view of the world and its interpretation of imagination described and explained the fantastic and non-rational aspect of imagination in terms other than the result of evil influence. The particles which invaded the mind, the Epicureans believed, sometimes combined with each other to form fantastic images of unnatural things, that did not and could not exist.

The Neoplatonists attempted to reconcile Platonic elements of both the Idea of the Good and the Aristotelian role of images in understanding. Plotinius recognized that imagination had base elements and could misrepresent truth by presenting mere appearance or illusion, yet it also played a role in producing the images necessary for thought of higher truth.

He suggested two imaginations, one, the non-rational sensory element, the other associated with rational thought. The imagination looked below for sensory information and above for images of thought. When in harmony the higher lead the lower. This dual nature of imagination enabled the Neoplatonists to not only ascribe a place for imagination in acquiring knowledge, but permitted a more conciliatory attitude towards works of arts and poetry and enabled such works to be viewed as not simply mimetic representations of reality, but also as representational of higher forms.

This Janus nature of imagination - its susceptibility to irrationality and evil and its simultaneous and necessary role in providing the images necessary for rational thought, was a paradox that continued to provoke inquiry into the role of imagination as Biblical conceptions of imagination began to be revived with the spread of Christian theology. Roman philosophers had added notions of materialism, subjectivity, fantasy and will to the discussion about imagination, and by the end of the Classical era conceptions of imagination included psychological explanations as well as metaphysical interpretations.

The Medieval imagination

No significant or radically new interpretations of imagination emerged during the Middle Ages as Christian philosophers attempted to reconcile the

metaphysical and psychological influences of Greek thought with theological concepts of faith and Divine Will. This was initiated in the work of Augustine and spanned the Middle Ages until the time of St. Thomas Aquinas .

Augustine was born in North Africa, then part of the Roman Empire, and received a classical education. He was later converted to Christianity. His ideas while chronologically placed within the Classical era were more representative of the philosophies of the Christian theologians that characterize the Medieval period. Drawing from theological and Greek philosophical thought, Augustine was highly suspicious of imagination, and his conception of imagination reflected both the taint of the original sin of rebellion against God in Biblical accounts and the Platonic suspicion of imagination as deceiving the mind and leading it from knowledge of truth. Influenced by Aristotle's views, however, Augustine believed that imagination, nonetheless, played a role in the development of knowledge as the mediator between visual sensation and intuitive mind. In a theological Trinitarian interpretation, Augustine placed visual sensation at the lower extreme, intuitive mind at its highest, and imagination in the middle bridging the two extremes.

Augustine was the first to make a clear distinction between sense-images, that is images created by sense impressions, and memory-images,

those reproduced from memory. He recognized the power of the imagination to recall and to transform, combine and re configure memory images by the action of will. Augustine believed that imaginative vision was different from corporeal vision and he rejected the term "*phantasia*", implying a passive and reproductive role, in favour of "*imaginatio*", reflecting a more active and a more willful nature of imagination than had previously been seen (Brann, 1991, p. 54).

Augustine's recognition of both the will of the imagination and the associated emotional response to a recalled impression caused Augustine concern about the unruly nature of the imagination and its tendency towards evil (possibly reflecting his own desire, yet his inability, to lead a sexually chaste life). Augustine believed that imaginative capabilities should be controlled and exercised with caution in their service to the higher authority of reason and the divine Will of God. "The medieval suspicion of imagination could hardly be more clearly stated," states Kearney, than in Thomas Aquinas' warning that, "Demons are known to work on men's imaginations until everything is other than it is" (1988, p. 130).

The prevalent view of imagination in the Middle Ages was that it was an element of the human soul that had a dual nature. When subordinated to reason it fulfilled a vital cognitive function, but when out of control, it was open to demonic influence. Medieval thinkers also believed that the

imagination had a distinct location and many descriptive and philosophical accounts sought to locate functions of the soul and intellectual functions, including imagination. Avicenna placed imagination in the front of the head, along with common sense. Albertus Magnus devised a descriptive scheme which identified two sets of organs, one associated with conceptual thought, the other with the complimentary aspects of imagination - reception, retention, opinion, memory, and fantasy. This early "faculty psychology" attempted to bring some conceptual precision to descriptions of the dual nature of imagination and to understandings of the *spiritus fantasticus* - the lower part of the human soul.

The culmination of thought about imagination in the medieval period is to be found in the work of Thomas Aquinas. Aquinas was one of the most famous and influential masters of the University of Paris which, during the late twelfth and thirteenth centuries, was the centre of scholasticism, the Western intellectual tradition drawn from the theological and classical philosophical traditions. Aquinas consolidated much medieval thought in his writings about imagination, suggesting both a mediating role for imagination between the mind and the body, but also insisting on the necessity to subject the imagination to reason so that it might not be corrupted by evil. Aquinas also echoed classical views in his assertion that the imagination was not an autonomous, creative capability. His metaphor

of "a storehouse of forms" captures the essentially mimetic nature of imagination (Kearney, 1988, p. 129).

Although official, scholastic and theological positions placed little significance on the imagination, the medieval era is particularly noted for the vivid exercise of the "profane imagination" in medieval folk culture and literature of the time (Le Goff, 1985). While official positions restrained by theological constraints recognized only the reproductive nature of imagination as valuable, its productive or creative power was evident in the rich "other" intellectual life. This reflected "the enduring struggle between high and popular culture" (Le Goff, 1985, p. 22) It was a time of belief in miracles and storytelling and the struggle between "God and Satan, that were in practice almost equal in strength even if in theory one was subordinate to the other."(ibid, p. 22). This manifestation of the creative imagination, it is suggested, was an indefatigable response to the repressive control that established Christian ideology exerted over Christendom in the Middle Ages. This,

> divorce between attitudes to imagination in philosophy and in popular culture largely perdured until the efflorescence of modern theories of the "productive imagination" in German idealism and European romanticism generally
>
> Kearney, 1988, p. 132

In the period that followed the medieval era, traditional theological views with their corresponding ideas about imagination were challenged by

convulsive changes in the medieval Christian church and the social revolutions of the fourteenth century. The Renaissance signaled the end of the domination of intellectual thought by Christendom and heralded the humanism of the modern world.

Imagination in the Renaissance

Renaissance humanists attempted to recapture the spirit of rational discourse, reinstate the values of human virtue, and achieve the ideals of classical thought. Classical art and philosophy were models for the revitalization of institutions, standards of education and morality, and for ideals of artistic and literary work. The intellectual context of the Renaissance was expansive. Previously lost or prohibited texts were available, the invention of the moveable press made writings widely accessible, and a thirst for classical learning lured foreign scholars to Florence and to other centres of learning. The humanistic optimism of the Italian Renaissance and the recognition of the human creative power is reflected in the sentiment of Matteo Palmieri, a Florentine businessman, in 1436,

> May every thoughtful spirit thank God that it has been given to him to be born in this new age, so filled with hope and promise, which has already enjoyed a greater array of gifted persons than the world has seen in a thousand years.
> Cited in Cunningham, 1982, p. 29

Despite this glorification of the human creative spirit, conceptions of imagination still reflected a fundamental belief in its mimetic nature or reproductive nature. In the works of Parcelus and Bruno the beginnings are seen of beliefs in the subjective nature of knowledge and the productive nature of imagination. These marginal philosophies, however had little impact on the mainstream thinking during the Renaissance. Indeed Bruno's thinking was condemned as heretical. The work of Pico della Mirandolla (1462 - 1494), one of the most gifted humanist scholars of the fifteenth century, exemplifies the prevailing conception of imagination. A former student of medieval Aristoteleanism at the University of Paris, Pico della Mirandolla drew on largely Biblical and classical sources and his description of imagination was largely a synthesis of previous thought. In his book *On the Imagination,* he echoed Platonic views of the willful and deceptive power of imagination but he also acknowledged a place for imagination in the disciplined service of reason.

In the writing of Francis Bacon (1561-1626), distinguished for framing both the techniques and philosophy of modern science, imagination received a largely scientific interpretation. In agreement with most preceding thought, Bacon stated, "because I find not any science that doth properly or fitly pertain to the Imagination, I see no cause to alter the previous division" (Bacon, 1605/1958, p. 121). Imagination was largely nothing more than an agent,

"Sense sendeth over to Imagination before reason have judged: and reason sendeth over to Imagination before the decree can be acted: for Imagination ever precedeth Voluntary motion" (ibid, p. 120). While Bacon recognized that imagination had some poetic and affective qualities, these were of no significance in serious thought. He states, "for as poesy, it is rather a pleasure or a play of Imagination, than a work or a duty thereof" (ibid, p. 121). More significant than his dismissal of imagination as a mere mediating agent in rational thought, was Bacon's criticism of the extreme involvement of imagination in religious belief, dogma and ceremonies. He claimed that,

> In matters of Faith and Religion, we raise imagination above our Reason; which is why Religion sought ever access to the mind by similitude, types, parables, visions, dreams. And again, by all persuasions that are wrought by eloquence, and other true impressions of nature, which do paint and disguise the real nature of things
>
> ibid, p. 121

Bacon's opinion of religion as a largely imaginative and, therefore, non-rational enterprises was to have a profound and far reaching impact. It challenged the belief in faith and divine revelation from which much of the strength of Christian teachings and the power of theologians were derived.

By the end of the fifteenth century some fundamental changes had begun to influence the intellectual climate and philosophical ideas of the Western world. Renaissance Humanism, the Reformation, and the rise of scientific empiricism challenged the fundamental primacy of religious dogma

and the theocentric view that had dominated Western thought during the Middle Ages. New scientific methods of inquiry and radical changes in philosophical thought began to form alternate views of man, his nature, his will, and his imagination.

IMAGINATION IN THE MODERN WORLD

The fundamental shift in beliefs about imagination that took place between the fifteenth and nineteenth centuries is reflected in Abram's metaphor that imagination, once conceived of as a mirror, is now replaced by imagination as a lamp (Abrams, 1958). Imagination is now seen as a productive rather than merely a reproductive capability. Meaning was a product of the human mind, not a "transcendent property of divine being" (Kearney, 1988, p. 155). The path that traces this shift in conceptions of imagination from the philosophies of scholasticism to modern conceptions of imagination can be followed from the Renaissance and through the formative influences of the Enlightenment in the writings of Hobbes, Descartes, Locke, Hume, and Kant.

The intellectual attitudes of this era were characterized more by a study of the "particular and the perceivable" than of the absolute and eternal. Philosophy ceased to be the preserve of theologians and instead became an increasingly independent discipline which no longer accepted divine or

supernatural explanations for the world or human existence. Imagination was also the subject of scientific, and psychological inquiry, and diversity and variation rather than uniformity marked subsequent thought about imagination and the search for truth.

Imagination and empiricism

René Descartes' (1596-1650) work was significant in marking a decisive split from the traditional view that meaning existed as some transcendental or divine force. "The Father of Modern Philosophy", Descartes rejected all beliefs that could not be decisively proven to be true. His belief that the only thing of which man could be certain is that he is a thinking being established an epistemological basis from which the human mind and its power to reason could construct meaning.

Despite this break with traditional beliefs about objective truth, Descartes' views about imagination were remarkably similar to previous accounts. He defined a body - mind dualism, the physical substance ,the body, brain and nervous system, and the thinking substance, the mind, thoughts, emotions and volitions. Descartes believed that images mediated between physical sensation and thought, and existed as ideas imprinted on a corporeal organ (possibly the pineal gland, was his guess), a notion rather similar to the Stoic view. These ideas, however, took on a non corporeal nature and were

the basis for intellectual thought. Imagination essentially mediated between body and mind.

Descartes was, however, suspicious of imagination. He saw it as somewhat unreliable, its images fleeting, obscure and imperfect. At best, it provided a rather inferior function of intermediary between the mind and the outside world in the service of reason. At worst it was irrational, emotional and unreliable. In *Aesthetic,* Benedetto Croce (1969) states,

> The obscure world of wit, taste, imagination, feeling and the *je ne sais quoi* was not selected or even, so to speak, included in the picture of Cartesian philosophy. The French philosopher abhorred imagination, the outcome, according to him, of the agitation of the animal spirits, and though not utterly condemning poetry, he allowed it to exist only in as far as it was guided by intellect, that being the sole faculty able to save men from the caprices of the *folle du logis*.. He tolerated it, but that was all.
>
> Croce, cited in Kearney, 1988, p. 163

In many respects Descartes adopted a rather traditional view of the imagination. His notion of "ideas", however, was later to be developed by Hume, and the dualism that he proposed between the physical and psychological aspects of mind provoked ongoing inquiry about the nature of the corporeal elements of body and its relationship to the mystical elements of mind.

A contemporary of Descartes, Thomas Hobbes (1588-1679) was one of the first proponents of materialism and the first to deny the existence of God, at least implicitly. Hobbes' ideas were drawn partly from Descartes' views

about materialism but most heavily from the works of Aristotle. Imagination was linked with the somewhat passive function of being "appeared to" and images were the result of sense-impressions or memory-images. Hobbes, however, suggested a material basis for the nature of images and suggested that motion accounted for the transfer of sensation to idea. The role of imagination in cognition, Hobbes believed, was merely to convey images. Even the "creation" of new images by the imagination was an act of simply combining elements of memory-images that had been received through previous sensory experiences into novel arrangements.

Although Hobbes adhered fairly closely to Aristotle's views he did extend his conception of imagination by recognizing the good fancy" or "good wit" which combine with "those grateful similes, metaphors and tropes, by which both poets and orators have it in their power to make things please or displease" (in White, 1990, p. 17). This description by Hobbes of the distinct nature of "fancy" was the first appearance in philosophical considerations of recognition of the inventive, creative power of imagination. Imagination, however, was still inextricably linked to sense images and necessarily governed by reason. In *The Answer to Davenant*, written in 1650, Thomas Hobbes wrote,

> All that is beautiful or defensible in building, or marvelous in engines and instruments of motion, whatever commodity men receive from the observations of the heavens, from the description of the earth, from the

> account of time, from walking on the seas, and whatsoever distinguishes the civility of Europe from the barbacity of American savages, is the workmanship of fancy, but guided by the precepts of true philosophy.
> in White 1992, p. 18

Although Hobbes recognized the influence and value of imagination in poetry, literature and other products of fancy, Locke (1632-1704) most certainly did not. An aggressive proponent of scientific empiricism, Locke saw such "fancies" as irrational, wanton, uncontrolled and fictitious. Reason provided the only way to truth and knowledge, and "fancy" because it mislead and corrupted was to be suppressed, particularly in the young. Locke's renunciation of poetry was so adamant that writers of the romance period accused him of "reducing the mind to a cold mechanism" (Kearney, 1988, p. 164). In Locke's reductionistic approach all thinking could be reduced to the having of "ideas", a notion derived from Descartes. Primary sensations such as images, and those derived from secondary sources - reflection, were represented as ideas, and there was no intermediary element between thinking and the objects of that thought. Locke, therefore, dismissed previous views that imagination mediated between sensation and ideas and played a role in the acquisition of knowledge, and he was dismissive of the creative, unreal, frivolous products of the inventive imagination.

Imagination was given a more inclusive role in perception and understanding in the revolutionary work of David Hume (1711-1776). Influenced by Descartes, Locke, and Berkeley who had suggested an active,

constructive rather than passive, receptive role for imagination, and by the empiricist tradition of inquiry, Hume asserted that the mind was informed not by one, but by two types of perceptions. "All perceptions of the mind resolve themselves into two kinds, which I shall call impressions and ideas". (1964, p. 1). All ideas were informed by impressions, and impressions, he claimed, were derived from sense experiences or from previous ideas. While sense experiences were fleeting, incomplete and random, the ideas formed from them were stable and complete. The formation of ideas from perceptions was achieved by the imagination, and it was, therefore, at the centre of perception and of knowing. The idea, the transformed image of an impression, was the primary object of thought, and knowledge was gained from contemplation of these ideas.

Hume's philosophy not only defined the subjective nature of knowledge but he also challenged the validity of knowledge derived through empirical inquiry. He argued that beliefs derived from observation or experience were not necessarily logical or rational. The validity of the understandings derived from such empirical sources depended largely on the vivacity of impressions and the ideas formed from those impressions. Hume also believed that the imagination was able to generate independent understandings, to actively form associations and develop a line of thought quite autonomously. He states,

> Nothing is more free than the imagination of man: and though it cannot exceed that original stock of ideas furnished by the internal and external senses, it has unlimited power of mixing, compounding, separating, and dividing these ideas, in all the varieties of fiction and vision
>
> 1950, p. 47

The subjectivity that Hume validated in his thinking, however, reduced the worlds of reality and reason to what are essentially individual fictions of the imagination. This contradiction with traditional notions of reason uncovering objective reality and empiricism establishing inviable truths was to cause Hume's ideas to be disregarded during his own time. His view of imagination as the power of self-associating perceptions - "the magical faculty in the soul" (Brann, 1991, p. 88), however, was " a brilliant notion waiting for a philosophical ground", a philosophical ground supplied by Kant (ibid, p. 89).

The transcendental imagination

Immanual Kant (1724-1804), inspired by Hume's ideas, developed a more clearly defined role for imagination in the development of knowledge and understanding. Kant asserted that the development of knowledge and understanding depended on the ability of the mind itself to order, structure and classify the multiple, varied, and random sense experiences that it received. Sensory experience merely supplies the substance of cognition, the faculty of our understanding provides the form. The imagination is a

necessary transcendental mediator between sense and understanding and provides the *a priori* categories or frameworks which enables the objects to be understood. Understanding results, not from the mere reflection by the imagination of ordered knowledge, but from the action on sensory information by the imagination. The mind determines how the world is to be perceived, and Kant believed that this synthesis of experience into coherent ideas is achieved unconsciously by the imagination, "the art concealed in the depths of the human soul". The term *Einbildungskraft* - the faculty that forms the many into one, aptly describes the Kantian productive imagination. This new "transcendental" role for imagination reconciled the subjectivity of knowing with the objectivity of knowledge, and in so doing established imagination as the "*sine qua non* of all genuine knowledge." (Kearney, 1988, p. 169)

Kant also attempted to reconcile the role of imagination in thought and reason with the creative, aesthetic dimension of imagination. The "free play of imagination" previously regarded by many philosophers as deceptive, trivial, dangerous or evil, was regarded by Kant as the autonomous, but still unconscious capacity of the mind to create its own means, it own ends and its own order. These faculties, he suggested, were not necessarily governed by principles guiding empirical judgments, but rather by the feeling of pleasure, appreciation or satisfaction that they provided. "In contemplation of beauty,"

Kant states, "the imagination is free and takes pleasure in its sense of freedom" (1952, p. 245). Kant's creative imagination, suggests Warnock,

> excites in us ideas which we realize *cannot* be represented in any other visible or other sensible forms - ideas which cannot be restricted or brought down to size by any image-making power of the imagination.
>
> Warnock, 1976, p. 56

Kant's transcendental imagination signified a major shift in the way that the imagination was viewed. Heidegger, indeed suggested that Kant's work was a watershed in Western philosophy. Imagination was redefined by Kant as both the necessary precondition for all knowledge and understanding and the source of aesthetic and creative expression. The influence of previous accounts of the purely reproductive nature of imagination, of beliefs in the metaphysical nature of knowledge, and of suspicion of the irrationality of "fancy" was eroded, if not entirely displaced. "After Kant," states Richard Kearney, "imagination could not be denied a central place in the modern theories of knowledge (epistemology), art (aesthetics) or existence (ontology)" (1988, p. 157).

The romantic imagination

German idealism took Kant's conception of imagination to its extreme. To the romanticists truth and reality could be achieved by the artist as well as by the scientist. "The objective world," wrote Schelling in *The System of*

Transcendental Idealism, "is only the original still unconscious poetry of the spirit" (cited in Kearney, 1988, p. 179).

While Kant regarded the creative imagination as some rather mystical element of the mind which worked unconsciously to both understand and to create, Schelling (1775-1854) claimed that the imagination worked at both an unconscious and conscious level. The synthesis of everyday experiences into understandings occurred at the unconscious level, the creative imagination combined both unconscious and conscious functions to shape and reshape ideas not only in artistic endeavors but in philosophical and intellectual thought. Schelling's philosophy finally rejected all notions of mystical or divine influence in human thinking and also challenged the belief that reason superseded imagination. Imagination, in fact, was the faculty which established the primacy of mankind. Schelling's claim that the "imagination is the organon and pinnacle of all philosophy" (in Kearney, 1988, p. 178), encapsulated the romantics' beliefs in man's creative genius. There appeared to be nothing the imagination could not do.

Coleridge took Schelling's ideas one step further elevating the creative aspect of imagination and dissolving, once and for all, the traditional association of imagination with imitation (*mimesis*). According to Coleridge, imagination had both a primary and a secondary function. The primary function was essentially Kantian in nature, unconsciously shaping sensations

into ideas. In its secondary form the imagination consciously and voluntarily shapes, reshapes and creates the world. While the unconscious understanding of everyday experience necessarily preceded and accompanied the creative functions of the conscious imagination, Coleridge claimed that latter was superior to the former. The expression of this creative power took aesthetic and literary forms and reached its highest form in the poetic faculty. Poetry, stated Wordsworth in the *Lyrical Ballads,* is the "first and last of all knowledge" (Prickett, 1975, p.55). The poet is the "orator of the imagination", states Stevens (1951, p. 142), and in the words of Wordsworth, he is,

> ...a man speaking to men: a man, it is true, endowed with more lively sensibility, more enthusiasm, more tenderness, who has a greater knowledge of human nature, and a more comprehensive soul than are supposed to be common among mankind; a man pleased with his own passions, and volitions, and who rejoices more than other men in the spirit of life that is in him; delighting to contemplate similar volitions and passions as are manifested in the goings-on of the universe, and habitually impelled to create them where he does not find them. To these qualities he has added a disposition to be affected more than any other men by absent things as if they were present; an ability of conjuring up in himself passions, which are indeed far from being the same as those produced by real events
>
> *Lyrical Ballads,* cited in Prickett, 1975, p.52.

During the Romantic period fundamental shifts in views about children and the particular nature of childhood also occurred. The child, states Luis De Granada (1555), had generally been regarded as "a lower animal in the form of a man" (in Schorsch, 1979, p. 11) and Aristotle's belief

that the child, "was an animal about to have reason" (Brann, 1991, p. 312), aptly described adult views of their irrational and naive minds, and particularly their imaginative worlds. The romantic view of childhood was a direct contrast to the traditional views of childhood. The romantics' fundamental belief, reflected in Rousseau's social theory, was that the adult is the child ruined by reason, and that mankind needed to reclaim the innocence of childhood. "A man is a god in ruins," stated Emerson, "infancy is the perpetual Messiah which comes into the arms of fallen men, and pleads with them to return to paradise" (ibid, p. 312). The poetic imagination enabled the innocent and honest vision and understanding of childhood to be captured and revived.

The end of the nineteenth century marked the end of a period of fundamental changes from the theological certainty of the middle ages to the infinite potential of human subjectivity of the twentieth century. The humanists' belief in the power of the imagination, however, was shaken by the realities of modern existence and the optimism of the enlightenment was deflated. Furthermore, the poetic rhetoric and the ambiguous and elevated assertions of the romantics were suspect,

> Where traditional philosophers, and even Kant himself, had proceeded by rigorous and painstaking argument, Schelling and his followers tend to offer us incantatory formulations, enigmatic aphorisms and sententious repetitions
>
> Kearney, 1988, p. 179

The failure of Romanticism to achieve its aspirations, suggests Stevens, belittled the true nature of imagination. Imagination came to be regarded as a faculty influenced more by emotion than by reason - "what sentimentality is to feeling" (1951, p. 138). As the idealistic imagination withdrew into a more private, spiritual world, "affirmative" cultural activities associated with the Western bourgeoisie began to rise. This movement, observed Marcuse, marks the widening divide between the aesthetic, creative products of imagination and the practical reality of the material world (in Kearney, 1988, p. 197), giving rise to later associations of imagination with idle luxury and indulgence,

IMAGINATION IN THE TWENTIETH CENTURY

In the twentieth century the study of imagination has become the science of consciousness. Psychological accounts of imagination have been focused largely on the role of images and imagery. The philosophical movements of phenomenology, existentialism and analytic philosophy have investigated the traditional views of the interdependence of image, thought and imagination and have also focused on the nature of the creative and synthetic imagination. Twentieth century inquiry has generally been predicated on assumptions about the subjective nature of knowledge and the

productive and synthetic functions of the human imagination - beliefs drawn largely from the work of Descartes, Hume and Kant.

Imagination and psychology

The emergence of experimental psychology as a field of inquiry in the late 1800's brought a new form of inquiry to the study of imagination. Its empirical methodology, however, limited the scope of questions about imagination it could reasonably answer. As noted by Gardner,

> if one cannot have access to the internal experiences and sensation of an animal or another person, it may be wise to suspend judgment about these experiences and to concentrate instead on activities that are manifest or at least easily measurable. But when contemplating one's own mental processes, exclusive perseveration on overt behavior seems unjustifiable
>
> 1987, p 323

Questions for inquiry have been largely derived from the supposed relationship of imagination and images, an association that had been reflected both in common language and use since its earliest meaning in C13 English (Williams, 1985), and formed the basis for several philosophical accounts of imagination. The internal and highly subjective nature of an individual's imagination itself cannot be investigated easily using experimental methods. Psychological studies of imagination, therefore, have focused attention on imagery as a somewhat more tangible and observable manifestation of imagination at work.

Behaviorist studies attempt to isolate, observe and measure images and imagery, but early studies by Galton and Wundt employing a method of introspection were largely inaccurate and ambiguous and empirical methodology was regarded as inadequate for an investigation of the unconscious. Studies of imagery were discredited and work was abandoned for a half century. More recent work has refined both the operational definitions and the experimental methodology of psychological studies and it has provided some sound scientific information about people's mental manipulation of images. Shepard claims that his work is significant, not necessarily for the particular results of these studies, but more importantly because they have provided some scientific confirmation of the introspective reports on which the study of the imagination has largely had to rely. This correlation of experimental and self reporting data adds some credence to studies, such as those by Shepard, Cooper and Kosslyn, which suggest that the process of discovery and creativity in fields other than artistic or literary endeavors involves imagery to a far greater extent than had been previously thought (Shepard, 1988, p. 154).

The interdisciplinary field of cognitive science has adopted a somewhat different approach, and "seeks to elucidate basic philosophical questions" (Gardner, 1987, p. 9) such as what it means to learn something, to know something, to remember something, to imagine something. Gardner claims

that psychology and other forms of empirical inquiry differ from philosophy only in the methods that they employ and that findings from these fields are equally important, -

> students of mental processes have from the time of the Greeks on singled out for study the capacity to conjure up in one's "mind's eye" various objects, scenes and experiences - entities that are not present in one's surroundings (and may never have existed at all)
>
> 1987, p. 324

It is not clear, however, that a study of imagery could inform a coherent theory of imagination or that current studies are themselves informed by a clear conception of imagination. Gardner himself recognizes that studies in psychology and cognitive science can be criticized for the narrow focus on pictorial images, for methodological inexactness and naive theorizing (ibid, p. 330). These studies are useful in as much as they provide additional information - grist for the philosophical mill. Certainly the work by Roger Shepard and Stephen Kosslyn raise questions about traditional beliefs in the distinctly different intellectual character of scientific inquiry and artistic creation. Harold Rugg's work in describing creativity also tries to blend psychological methodology with philosophical inquiry and attempts to establish some frameworks for creative thinking and the insight of discovery. Generally speaking, however, most scientific findings about imagery "confirm belatedly and laboriously what has been long known to ordinary people" (Brann, 1991, p. 264).

The field of psychological inquiry has also provided descriptions and interpretations of the imaginary lives of children and interpretations of their significance by writers such as Freud and Bettleheim. Cognitive-imagery theories and developmental theories have been presented by Bruner, Piaget and Kohlberg; the relationship of imagination to memory and to learning has been explored; and the link between visual perception and neurophysiological processes has been investigated. While many of these findings provide some interesting information about the specific topic or relationship, they add little further to a comprehensive account of imagination. In fact Bruner (1986) suggests that the very nature of these reductionistic studies and the prescriptions derived from them limit rather than expand our knowledge and our view of human thinking. Gardner claims that an empirical science, albeit a multi-disciplinary one, can in time unravel the nature of human thought and understanding, but the field has had little substantive influence on views of the imagination.

The existentialist imagination

Early twentieth century views of imagination reflected, not the infinite scope of man's intellectual potential, but the finite limits of his existence. The existentialists, notes Kearney, "brought imagination back to earth" (1988, p. 196). The rejection of beliefs in an objective reality reached its peak in the

work of the existentialists. In this respect, and in this respect only, the existentialist view of the productive power of the imagination was similar to that of the romantic idealists.

The particular characteristics of the existentialist imagination had their genesis in the writings of Kierkegaard and Nietzsche, were influenced to some extent by the phenomenological philosophies of Husserl and Heidegger, and culminated in the work of Sartre. Neither Kierkegaard nor Nietzsche developed fully comprehensive philosophies of imagination but they each challenged the notion of the creative idealist imagination. Kierkegaard declared imagination a symptom of youthful idealism incompatible with the realities of everyday existence and suffering. Nietzsche regarded imagination as the will to place order and meaning on the nothingness of existence and capable only of illusions. Imagination, he suggested, was arbitrary and inauthentic because its illusions are taken for truth.

In the work of Husserl (1962) the imagination is further freed from its traditional relationship with reality and perception and from the view that imagination somehow provides a link between the sensible world and the intellect. The imagination is seen as a productive act of consciousness rather than a reproductive feat, and as responsible for the original synthesis of ideas. As such it plays a central role in thought and in knowing. A common feature of philosophical accounts is the theme of imagination enabling the

individual to transcend the world as given and to choose to value other possibilities. In this sense questions of imagination have ethical as well as epistemological and ontological dimensions.

Sartre's writings re-established a human (psychological) basis for imagination and drew heavily on the ideas of Husserl who suggested that a distinction should be made between perception and thoughts. Images, he believed, should be thought of not as not objects in consciousness as had traditionally been the case. Rather, they were acts of consciousness. Sartre proposed that while it is possible to visualize an object, the image does not exist as an entity in the mind but more as a consciousness of an image. "Images" do not have a direct representational function as much as a symbolic or analogical function. One, therefore, does not have a visual image of one's dog, one is conscious of the image of the dog and this consciousness can take many forms.

Sartre's ideas marked a significant departure from previous thought in several major respects. He defined images as having a symbolic rather than representational function - the reality of the image was different from literal reality. He regarded the image as not simply a passive entity which resided in the mind, but the result of a productive act of consciousness. Sartre also proposed that the imagination spontaneously creates meaning out of itself. In this respect, "... imagination, far from appearing as an actual characteristic

of consciousness turns out to be an essential and transcendent condition of consciousness" (Sartre, 1972, p. 270). Sartre believed that imagination is not bounded by perception, but is free to intentionally create its own meanings. The images created, however, are not mental "objects", but an essential "nothingness" not to be confused with the real world, and it is the ability to separate from the actual and imagine the non actual that is the most significant property of imagination.

Wittgenstein (1965) brought questions about imagination out of the internal world of inner objects and processes, and moved the discussion in the direction of an analysis of their concepts. He made a distinction between literal, unambiguous, conventional "seeing that" with nonliteral "seeing as". The latter enables the individual to experience more that just what it appears to be. He suggests that the ability to hear or see something as a variation on a theme requires imagination. In *Philosophical Investigations* he proposed no comprehensive view of imagination, but instead approached an analysis of the concept by suggesting that, "one ought to ask, not what images are or what happens when one imagines anything, but how the word "imagination" is used"(cited in Brann, 1991, p 165).

Ryle argued against the image as an entity that one could, in some way, see or hear and that was in some way a copy of an object. Ryle contended that imagination-language such as "seeing" and "in the mind's eye" were

themselves the basis for the misconceptions about the nature of "images" and that real picture seeing such as photographs, paintings and so on added further conceptual confusion. He argued that one does not, in fact, "see" the family dog, with any organ in the mind associated with "seeing", rather one imagines that one sees the animal. In contrast to preceding views that had recognized imagination as a discrete faculty or entity fulfilling a distinct role, Ryle asserted that,

> There is no Special Faculty of Imagination, occupying itself single-mindedly in fancied viewings and hearings. On the contrary, "seeing" things is one exercise of the imagination, growling somewhat like a bear is another: smelling things in the mind's nose is an uncommon act of fancy, malingering a very common one
>
> 1963, p. 257

In agreement with Ryle that there is no distinct entity that one might call a "faculty" of imagination, Barrow suggested that we can recognize and define imagination only in respect to the unusual and effective nature of its conceptualizations (1988, p. 84). This position argues that there are normative or honorific association with the terms "imagination" and "imaginative" and that imaginative thought can be distinguished from ordinary thought by the quality of the conceptualizations that are produced.

In this analytic tradition, White (1990), has also considered the ways in which we claim to imagine and things we can imagine. He suggests that the traditional associations of imagination with images and imagery has

restricted our understanding of imagination. The having of images, he claims, does not necessarily imply imagination, nor does imagination always work through the manipulation of images. Visualization is not necessarily involved in imagining, nor are we restricted to imagining what we have perceived. White, through a thorough and careful analysis of what we *know* we can imagine suggested that imagination is simply the power to think of something "as possibly being so" (ibid, p. 184).

Post modern thinkers have questioned and deconstructed traditional views, and have cast a "suspecting glance on the modernist cult of creative originality" (Kearney, 1988, p. 21). They have criticized traditional views, disputed their underlying assumptions, and suggested that the term "imagination" carries with it values and implicit assumptions that are obsolete and inaccurate. They have challenged anthropocentric philosophies and have questioned the very notion of a creative imagination - the imagination of romanticism, idealism and existentialism suggesting that it is a mere ideological illusion. Heidegger (1971), for example, questions humanistic subjectivism as the origin of meaning, and Foucault (1972) suggests that unconscious structural "codes", not the conscious act of construction generates understanding. This "postmodern threat to abolish the humanistic imagination," suggests Kearney, "coincides with growing talk of 'man' as a subject of identity" (1988, p.13).

CURRENT VIEWS

Current views of imagination reflect a curious mix of definitions and understandings derived both from traditional sources and from modern views informed by a more analytical or skeptical approach to previous theories. The most prevalent theme in current accounts, however, is the view that imagination is not simply (or even necessarily) the ability to reflect or rearrange sense perceptions of the world, but that it is an active and generative factor in the development of knowledge and the creation of alternate views. Maxine Greene states that " to imagine (is) to look at things as if they truly could be otherwise" (1988, p. 55). Wallace Stevens states, "the imagination is the power of the mind over possibilities" (1951, p. 134). Imagination, it is believed, enables us to conceive of possibilities and, therefore, to be able to think in unconventional or novel ways, and Barrow suggests that this distinct aspect of human intelligence can be displayed to different degrees, and takes different forms in different contexts (1988, p. 83). Imaginative thought, as opposed to conventional thought, is characterized by unusual and effective conceptualization. (ibid, p. 84).

White (1990) suggests that to imagine is to think of something as possibly being so. Imagination is an active, conscious faculty, capable of constructive, non conventional and creative thought. White further states,

> Imagination is linked to discovery, invention and originality because it is a thought of the possible rather than of the actual, of what might or could be so rather than what is or must be so, even when what is possible happens, unknown to the thinker, to be actual.
>
> ibid, p. 186

White's views are not, however, totally representative of current thought, and previous views about the role of imagination in thought and perception have not been entirely superseded or abandoned. Warnock, drawing on the work of Hume and Kant, suggests that imagination is central to perception itself. Imagination is,

> ... a power in the human mind which is at work in our every-day perception of the world, and which is also at work in our thoughts about what is absent; which enables us to see the world, whether present or absent as significant.
>
> 1976, p. 196

Warnock defines imagination as an all-encompassing "meta-faculty". Egan, however, suggests that such a conception of imagination is obsolete since modern accounts do not "look for some faculty to transmute world stuff into mind stuff" (1992, p. 39). Neither is Warnock's conception entirely consistent with current views that the imagination is both active and conscious, and it does not reflect Barrow's normative distinction that imaginative thought is qualitatively different from conventional thought. "Exercise of the imagination," states Hanson, "moves us away from the conventional, the common, and the familiar." (1988, p. 138) and is not involved in everyday perceptions and conventional thought.

Warnock also revives the affective dimension that is thought to be associated with the imagination. She suggests that imagination "is not only intellectual. Its impetus comes from the emotions as much as from the reason" (1976, p. 196). This is a view shared by Scheffler who describes the cognitive emotions associated with imaginative thought - the surprise that motivates a search for imaginative explanation and the joy of verification. Egan also suggests that there is an association between imagination and emotion, "the imagination enables us to feel about something not present or even real as though it were real and present" (1992, p. 40). In this respect he echoes Aristotle's recognition of the powerful affective force of the imagination.

Brann admits to an "unfashionable" view of the imagination in her attempt to mount a "small revolt against anti-imagistic rationalism" (1991, p. 204). She suggests that,

> There is a distinct psychic power, analogously described as a mind's eye, that "sees" representations immanent in an inner, psychic space. These are rightly called images. ... it is the nature of the imagination to be a dual faculty that simultaneously forms and sees picture-like resemblances.
>
> p. 193

Ryle and White, however, argue that exercise of the imagination does not necessarily presuppose the having of "images" but this view is clearly not universal. The role of images, quasi images, intuitions or representations in imagination is neither clear nor conclusive. Egan suggests that,

> It may not be invariably true that imagination involves our image-forming capacity, but image-forming is certainly common in the uses of the imagination and *may* in subtle ways be inevitably involved in all forms of imagining;
>
> 1992. p 43

Current dictionary definitions of imagination reflect a mix of elements which, in a sense, capture the diversity of current uses of imagination. The *Webster's New World Dictionary* (1988) for example offers the following definitions:-

Imagination:

1a. the act or power of forming mental images of what is not actually present

b. the act or power of creating mental images of what has never actually been experienced, or of creating new images or ideas by combining previous experiences; creative power

2. anything imagined; mental image; creation of the mind; fancy

3. a foolish notion; empty fancy

4. the ability to understand and appreciate imaginative creations of others, esp. works of art or literature

5. resourcefulness in dealing with new or unusual experiences

6. [Obs] an evil plan or scheme

Finally, in a definition which reflects many of the dominant themes in current accounts, Egan suggests that imagination is,

> ..the capacity to think of things as possibly being so; it is an intentional act of mind; it is the source of invention, novelty, and generativity; it is not implicated in perception and in the construction of all meaning; it is not distinct from rationality but rather is a capacity that greatly enriches rational thinking. The imaginative person has this in a high degree.
>
> 1992, p. 43

The concept of "imagination" continues to be analyzed and debated. As pointed out by Kearney, "Clearly, imagining cannot be expected to mean exactly the same thing today as it did in the Middle Ages or antiquity. For one thing, Aristotle and Aquinas never watched television" (1991, p. 6). While this point is somewhat crude it emphasizes the fact that current discussions about imagination take place in a world where changing technologies, forms of communication, and social values make some traditional interpretations obsolete, and new and different sets of questions are brought to the interpretation. Post modernism, hermeneutics and cognitive science bring different methodologies and perspectives to the study of the term and, as clearly demonstrated by the story of imagination to this point, changes in epistemological or etiological suppositions also inevitably influence views of imagination. The story of the human imagination is, likely, not yet over.

CONCLUSION

The history of philosophical views of imagination shows that the terms *yetser, phantasia, eikasia, imaginatio, Einbildungskraft, imagination,* have meant very different things over time and that the term "imagining" has carried very different connotations. The formative influences, continuities and changes in definitions can be traced from one era to the next, each reflecting the underlying beliefs and assumptions of the philosophers

and the culture that defined their character. Among the most notable and influential of these theories of imagination have been those of Plato, Aristotle, Hume, Kant, Sartre and Ryle. Some meanings of the term "imagination" derived from these and other theories have been abandoned, but vestiges of many of the interpretations continue to exist in everyday use and common language, and, to varying degrees, in philosophical analyses. Some of the more tenacious legacies of past views include associations of imagination with some sort of distinct faculty, with the creation of images, with irrationality, with idealism, with fancy, with artistic and literary creativity, with luxury, with madness, with genius, with mystical or divine inspiration, and with illusion. These associations and their implied epistemological assumptions have combined with current views to make present uses, definitions and understandings of the term "imagination" varied, complex and often contradictory.

In his inquiry into the imagination and its role in the creation of new ideas, Rugg suggests that until we have an appropriate conception of imagination, "we shall continue to work without an adequate theory of teaching" (1963, p. 287). However, as the preceding review has indicated that there appears to be no single or comprehensive conception that encompasses all the philosophical interpretations or common views about what imagination actually is. Eva Brann has noted that the history of imagination

offers no lasting resolution about the nature of imagination, but does offer various formulations, perspectives and possibilities.

In the following chapters, therefore, I will try to derive from these "possibilities" a conception of imagination, and a definition of imaginative thinking which may have some current educational value and some worthwhile and possible pedagogical application. I will discuss the question of whether the power to imagine is a capability that all individuals have to some degree, and I will then discuss the practical application of the definitions I propose, in the classroom.

Chapter 3

AN ANALYSIS OF TERMS

imagining and imaginative thinking

As suggested in Chapter Two, the terms imagination, imagining and imaginative might be used in somewhat different ways and connote somewhat different things. In everyday conversation this may not be particularly problematic. A general sense of what is meant is usually sufficient for interpersonal discourse, and as long as the uses of these terms meet certain constraints, it is likely not particularly consequential that the speaker and the listener necessarily share the same fundamental conceptions of imagination, if indeed they even cared to consider what these might be.

In matters of educational philosophy or practice, however, it is critical to establish the particular sense in which terms such as imagination, imagining and imaginative thinking are to be used and understood. Barrow has noted that while there is general agreement that education should seek to develop imagination, our view of the concept is confused, and "the consequence is that what we do in schools to attain our ideal is generally

inappropriate" (1990, p. 1). As the previous chapter has indicated, notions of immaturity, irrationality, fantasy, visualization and artistic creativity are still associated with imagination, and each of these imply certain values and particular epistemological presuppositions, and suggest distinctive activities that differ significantly from those implied by a different understanding of the term. As Augustine's observation suggests, we all understand something about imagination, but these varying individual interpretations of the terms present opportunities for conceptual obscurity, misunderstanding and contradiction.

In this chapter, therefore, I will clarify the sense in which the terms imagination, imagining and imaginative thinking will be used in subsequent chapters, while acknowledging that other legitimate conceptions of imagination and its value and role in education might be quite possible. I will take the basic position that education is primarily concerned with the intellectual development of young people, and that it seeks to develop sound knowledge and intellectual acuity, and encourage critical and independent dispositions in students.[1] In order to develop an understanding of imagination which is consistent with these educational goals I do not propose

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1. In taking this basic position I will clearly be focusing on the academic or intellectual role of imagination in education. I recognize, however, that education is also concerned with the affective and social development of children. The thesis will, however, not speak to the role that imagination might play in these other domains.

to argue the merits of the varied, often contradictory accounts of imagination reviewed in Chapter Two. Rather, I will focus on two particular issues raised by the preceding review. The first issue relates to the question of whether imagination exists as a faculty, an entity, a "thing" that indeed might be exercised and developed. The second point is related to the nature of imagining and the characteristics of imaginative thinking. My own position will draw primarily on the work of Ryle, White and Barrow.

Imagination and Imagining

Kearney suggested that the history of imagination is characterized by a number of paradigm shifts in the way that imagination was viewed. One of the most significant of these occurred with Ryle's statement that "there is no Special Faculty of Imagination" (1963, p. 257). Preceding accounts had referred to imagination as an entity existing somewhere between the body and the mind, and early Biblical, Greek and Medieval accounts had suggested that the imagination played a role in mediating between the external world of objective knowledge and the mind, creating images, storing forms, reflecting and being subject to external influences. Early faculty psychology, in fact, gave imagination a distinct location in the body. In the ideas of Hume, Kant and the romanticists, the imagination was ascribed a productive as well as a reproductive function. Imagination was an active, autonomous, faculty

ordering and unifying experiences into knowledge and understanding. It was described by Hume as the inexplicable "magical faculty", and by Kant as the "art concealed in the human soul".

Ryle, Sartre and Barrow, however, question the assumption that some "thing" called imagination exists apart from any act or activity. They assert that previous assumptions that imagination might be defined as some sort of independent faculty were fundamentally wrong. Imagination, they suggest, may be recognized and defined only in terms of its activity. A person simply cannot be described as possessing imagination unless the individual has, in fact, imagined something, and it is not possible to describe a person's imagination, only the imaginative nature of his or her conceptions. The imagination, therefore, cannot be exercised or developed other than by involving it in imagining. In developing a workable conception of imagination I will begin by taking the position, in agreement with Ryle, Sartre, Barrow, and subsequent analytic theorists, that imagination does not exist as a distinct faculty or entity. It exists as some sort of capability or potentiality which is exercised or manifested in the act of imagining.

It is, however, possible to speak of imagining a vast array of things. One might imagine the sight of the ripe, red apple picked yesterday, its smell, and the feel of its smooth surface. It is common to speak about imagining concepts or ideas that are not linked directly with sensory perception or direct

experience such as imagining inventing a solution to the problem of world hunger. One could speak about imagining things that are within the realm of possibility, such as a car sliding off the road in icy conditions, or entirely unlikely things such as a flying horse with a dozen heads. One's thinking might be fantastic or whimsical, such as imagining psychedelic monsters dancing in a sea of gold, or the things that one could imagine might be morbid or bizarre. One might "just imagine him taking off like that", or, be "unable to imagine what she sees in him". One might consciously and deliberately imagine a particular object, scenario, or possibility, or one's mind might wander in random imaginings and daydreams. One might dress up like a detective and imagine that one is Hercule Poirot or imagine the look on one's daughter's face when she receives a puppy for Christmas. One might claim to have vivid images, or admit to having no imagination at all.

Although these examples suggest that the term "imagine" is commonly used in a variety of ways, Alan White (1991) suggests that many of the activities termed "imagining" might be more appropriately described as pretending, supposing, imagining that, or remembering. In *The Language of Imagination*, he suggests that the term "imagine" describes a particular way of thinking which is not synonymous or interchangeable with terms such as pretending, remembering, and supposing. These activities, he suggests, may involve elements of imagining, but are, in fact, different in form and in

function. Most particularly, he argues that "seeing in one's mind's eye", visualizing, or imaging is not necessarily imagining, although imagination has been associated with the creation of visual images since the early accounts of Aristotle.

White suggests that there is a clear conceptual distinction to be made between visualization or imagery - having an image of an object, and imagining - thinking of an object or concept in a particular way - as it might be rather than as it actually is. We more often imagine the non-imageable than the imageable, he suggests, and the assumption that the presence of images necessarily connotes the use of imagination is fundamentally incorrect. One can imagine without images, and one can visualize or experience (hear, feel etc.) quasi-images without imagining, although certain forms of imagining may indeed involve imagery or visualization. He attributes the persistent connection between the having of images with imagination to the inherited notions of perceptual imagination, which, he states, "arose from seeking the origin of imagination in prior perception as the only source from which its operations could come" (1990, p. 192).

Imagination is exercised in imagining, White states, "just as thought is something which can be exercised in thinking" (1990, p. 185). "To imagine something," he states, "is to think of something as possibly so" (ibid, p. 184) and he states that,

> one and the same sense of 'imagine' is being used whether one is imagining a face, a chair as a fortress, a room as bigger than it really is, that it is going to rain or a problem to be easy, why, where, when or what so-and-so is, how to such-and-such
>
> White, 1990, p. 187

White, however, defines imagining as a <u>particular way</u> of thinking about something. Simply recalling the image of a red apple cannot be said to be imagining, neither can replaying the images, sights and sounds of one's car accident. Thinking of a red apple as it might be painted by an impressionist or as seen by a schizophrenic, or thinking about what would have happened if we had slowed a little more on the bend and controlled the skid are more accurate examples of the type of thinking that White suggests involves imagination. Imagining is not simply recalling images or quasi-images, or thinking of things as they actually are, but thinking of what "might be".

White has also pointed out clear differences between "imagining" and some of the terms that are frequently thought to imply or suggest the use of imagination, terms such as visualizing, remembering, supposing, pretending and imagining-that. *Visualizing* or *remembering* the scene at a circus ground, or experiencing sensory quasi-images of the sounds or smells is not, he suggests, the same as *imagining* a circus ground. One is bound by the particular memories of perceptions, the other is fluid and is bound only by the limitations of the imagination. Imagining that and supposing are also different from imagining. White contrasts the freedom of the imagination to create various, diverse, and sometimes fantastic alternatives when

imagining, such as *imagining* running off to Rio, with the limited and specific outcomes which might result from *supposing* that one ran off to Rio or *imagining-that* one is running off to Rio. Imagining, White claims, generates possibilities that are unconstrained and boundless. Imagining that, or supposing, is to think of a particular experience or occurrence, and it is limited by the specific circumstances, by the realistic probabilities, or by the logical and predictable outcomes of the event.

White also points out differences between playing and *pretending* (and performing) and imagining. Pretending to be a pirate on the high seas, for instance, may differ from *imagining* what it is like to be an old debauched sea dog who has spent his life terrorizing shipping. These activities are, he suggests, entirely different in terms of function and in outcome. *Pretending* simply reproduces or mimics the actions associated with pirates, *imagining* explores the manifold possibilities of a life of piracy. Weininger also makes this distinction between the "as if" of pretending and the "what if" of imagining (1988, p. 148). Imagining, suggests White, is liberated from the constraints of the actual, the here and now, the experienced and the conventional, and is free to generate and explore alternatives. Although the terms pretending, visualizing and supposing are clearly not synonymous with imagining, they are often used rather interchangeably in common or everyday use. White claims, however, that the terms are not synonymous,

and that clear distinctions need to be made between those activities which involve thinking about possibility, and those which simply recall or reproduce what is actual.

White not only defines what imagination is and what can rightly be called imagining, but he separates it quite clearly from what imagining is not. In some respects, he echoes the distinction made by Sartre between the mental activities of recalling perceptual experiences - what is, and consciously creating new meanings - what might be, and Wittgenstein's differentiation between "seeing that" and "seeing as". White, however, appears to go further. He seems to dispense entirely with the traditional view that imagination has two distinct functions - the reproductive and the productive. Imagination, according to White, is a faculty which is exercised in imagining, and imagining is thinking of things as possibly so. Imagination, therefore, is simply generative, creative, and productive. This separation of imagining from other mental acts of recalling, remembering, pretending, supposing and "seeing in the mind's eye", provides a more specific and more focused definition of the types of intellectual activities that are associated with imagination, and in particular, distinguishes it from the purely mimetic or image-making functions that it has traditionally often been associated with.

Imagining is a certain way of thinking of things that explores what might possibly be so. One could imagine possible alternatives, such as the

possible actions that might save a drowning man, or the possible uses for recycled tires. One could also think of possible reasons or explanations, such as imagining the reasons that a friend might be late for dinner, or the possible reasons for an unexplained brightness in the heavens. Scenarios or events could be imagined, such as the Battle of Trafalgar, or one's child's long awaited graduation. People, places and things can be imagined as other than they are - modified in some way, inverted or reversed, extended, juxtaposed with unrelated elements: people with the ability to communicate telepathically, the Taj Mahal relocated in the Arctic, an image of a bicycle being rotated within a glass sphere.

One might imagine possible experiences, such as being the first human to set foot on Mars, being a black woman in South Africa, or being a mutineer on the *Bounty*. Possible occurrences could be imagined like imagining the outbreak of a global war, contact with an extraterrestrial being, or losing one's job. Possible outcomes could be imagined, such as imagining what might result if a giraffe was crossed with a rabbit, imagining what might happen if global warming caused sea levels to rise and cover most land masses. One might also imagine possible interpretations, such as imagining the various significances in a poem, the emotions conveyed by a painting, the images captured in a television newscast. One could also imagine possible forms of expression, such as how to express disillusionment in a dance form, how to

express the tragedy of a child's death in a 3-dimensional metal construction, how to convey the idiocy of war in song, or the passion of youthful love in a film. One's imaginings might take sensory forms such as sounds, sights, and feelings as well as more abstract conceptions.

Each of these acts of imagining could generate a number of possibilities that could be embellished with copious details. Each could generate somewhat sensible or realistic possibilities, or each could be stretched to extraordinary lengths unconstrained by actuality or by limitations other than those placed by the individual's own mind. The ideas might be accompanied by, or take the form of, rich imagery or emotional or somatic responses, and the imagination might generate ideas of varying inventiveness in most areas of life - intellectual, practical, social, personal and artistic. "People may display imagination in different degrees in different contexts, "suggests Barrow (1988, p. 83).

White's view of imagination as the intellectual capacity which enables people to imagine the unusual, or to look beyond what is actual to what is possible is consistent with a number of other philosophers, researchers and educators. Maxine Greene suggests that imagining is the ability to "regard things as if they could be otherwise" (1988, p. 45), and Robin Barrow concludes that one criterion of imagination is the ability "to conceive of the unusual" (1988, p. 84). The poet Wallace Stevens states that, "imagination is the power

of the mind over possibilities" (1951, p. 134), and he suggests that the imagination is the "power that enables us to see the normal in the abnormal, the opposite of chaos in chaos" (ibid, p. 153). Brian Sutton-Smith proposes that imagination might be, "simply the subjunctive mood" (1988, p. 3), one which expresses possibility or hypothesis. Karen Hanson also supports the view that imagining is a particular way of thinking which is not bound by conventional ideas, is not common or familiar, and which presents viable alternatives to actuality. She states,

> Imagination is what allows us to envision possibilities in or beyond the actualities in which we are immersed. We do not thus merely escape in thought the bounds of reality; we know that something other than the immediately temporary reality is possible.
>
> 1988, p. 138

Imaginative

> *Webster's New World Dictionary* defines "imaginative " as:-
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> "1 having, using or showing imagination; having great creative powers
> 2 given to imagining
> 3 of or resulting from imagination"
>
> 1988, p. 673

This suggests that a number of things might be described as "imaginative". People might be described as imaginative when they show "the ability to think of lots of possibilities, usually with some degree of richness or detail" (White, 1990, p. 185), or when they produce ideas or conceptualizations which

are unusual, or which present an unconventional approach to a question or problem. A person who constantly daydreams and relates bizarre and fantastic stories might be described as imaginative, as might the individual who perpetually interprets events in unusual ways. Ideas can be described as imaginative. Unique conceptualizations, a child's whimsical stories, an eccentric's dress, wild daydreams, an artist's exotic painting, any number of inventions reviewed by the patent office, effective solutions to everyday problems and so on, might be commonly described as imaginative. There is a sense in which the term "imaginative" might be used to describe any and all imagined ideas, and similarly any person who imagines something might be described as imaginative. Used in this descriptive sense, the term "imaginative" implies no value or judgment.

The term "imaginative", however, is more typically used as a normative term, and in this sense it does not necessarily follow that being able to think of "lots of possibilities usually with some degree of richness or detail" (White, 1990, p. 185) means that a person is "imaginative" as opposed to wildly eccentric or inventive. Barrow states that,

> merely to generate unusual ideas does not deserve the epithet '*imaginative*", for if the ideas are absurd, unworkable, logically incoherent, and so forth, then no normative label is deserved at all
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> 1988, p. 84

While I have used "imagination" and "imagining" as descriptive terms which refer to the particular intellectual capacity and its activity, "imaginative" is more frequently used as a normative term which implies, "a great deal more than neutral references to the capacity to engage in abstract representations in one way or another" (Barrow, 1988, p. 81). This is, I believe, the most appropriate sense in which this term should be used. Any and all imagined possibilities are not necessarily imaginative ideas. Imaginative people are judged, not so much by the richness of their imaginings but by the quality of their conceptions. Imaginative ideas are judged to be qualitatively different from those which are pedestrian, mundane and simply state the obvious. They are ideas which suggest what is possible rather than what is actual.

"To be imaginative," states Barrow, "is to have the inclination consciously to conceive of the unusual and effective in particular contexts" (1988, p. 84). What constitute imaginative conceptualizations in different fields of endeavor vary. What is unusual or effective in areas as divergent as poetry, architectural design, parenting, or the generation of a unique scientific hypothesis, reflects the particular nature of each field's "own canons of quality against which unusualness and effectiveness have to be judged" (ibid, p. 84). Barrow acknowledges that ideas might be imaginative without necessarily being particularly unusual in any objective sense, for example, in

the thinking of a young child whose work, "though perhaps not original and of high quality in any objective sense, may nonetheless represent originality and quality in terms of the child's own progress" (ibid, p. 88). However, his criteria of unusualness or originality and effectiveness imply an element of novelty, and this raises the issue of the relationship between imaginative and creative thinking. It raises the question of what distinctions there may be between imaginative and creative conceptualizations, and it also poses the questions of whether imaginative ideas must, indeed, be creative in some sense, and whether creative ideas are always imaginative.

Creative ideas, states Hausman, are not simply thoughts of the possible, or ideas that are simply different or unusual. Creative conceptualizations, he asserts are "radically new" or unprecedented (1987, p. 382). Taken in an objective sense, it is clear that imaginative ideas are not creative unless they meet the criterion of being totally unprecedented. However, this is not the sense in which the terms "creative" or "imaginative" are most commonly used. Barrow suggests that the "logic of creativity is very similar to that of imagination" (1990, p. 114), and that "creative", like "imaginative" is a term which implies certain normative criteria. The term "creative", he suggests, intimates a conscious and intentional act of producing "something of originality and quality" (ibid, p. 114). In the sense that imaginative conceptions are thoughts of "what might be possible", rather than a

reproduction of "what is actual", imaginative ideas may clearly be original or novel. If imaginative ideas are also valid, effective and worthwhile, they may meet the criteria of originality and quality for the conceptualization to be judged as creative. However, it is not clear that all creative ideas are necessarily the outcome of thinking of possibilities. Ideas which express originality and quality which are derived through deductive reasoning, from conscious trial and error, or an experimental juxtaposition or play with various elements may certainly meet criteria for uniqueness and quality, and be recognized as "creative". They may not, however, necessarily be "imaginative" in the sense that the individual has consciously imagined, considered, and refined an imagined possibility in the generating of the idea or artifact. [2]

Imaginative thinking, thinking of possibilities, might play a central and important role in the generation of creative ideas, and creative thinking

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2. While I acknowledge that I might be accused of making too fine a distinction, I think there is an important distinction to be made. The term "creative", as Barrow and Hausman have stated, is determined by the qualities of the ideas and products that are produced, and not necessarily by the intellectual process of its conception. An idea which is unique, original, effective and valid may well be described as "creative" regardless of the process by which it was produced. In school classrooms, the production of a "creative" idea may not indicate that the child has indeed been imaginative in its production, although many artistic, literary activities may suppose this to be the case. A unique poem or picture, for example, may have be produced by a child simply applying some formulaic structures rather than being imaginative as defined

may indeed involve thinking imaginatively. Both involve the generation of new, valid and worthwhile conceptions. However, imaginative thinking is not defined solely by criteria of unusualness or originality in the objective sense that Hausman suggests. White states that the ability to think of the possible rather than the actual "is linked to discovery, invention and originality" (White, 1990, p. 186), but he also points out that an individual's imaginative conceptualization may happen, "unknown to the thinker, to be actual" (ibid, p. 186). The generation of possibilities may indeed generate a radically new conception, but at a more modest or everyday level, the capacity to generate possibilities or other ways of seeing things, also enables an individual to transcend his or her own customary view, to develop a new conception or acquire a different perspective, or to simply generate ingenious and intelligent solutions to everyday questions.

Imaginative ideas are judged relative to the individual's own experience and intellectual maturity.[3] This does not, however, mean that any and all subjective or relativistic ideas can be described as imaginative, or that

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[3] This implies that thinking imaginatively is not defined simply by objective criteria of novelty or creative insight, but might be achieved by people in a wide range of situations. It also suggests that a judgment of the overall validity of an idea must necessarily take into account the knowledge and experience that is assumed of the thinker. Clearly the older and more sophisticated the individual, the greater the experience and knowledge they bring to a consideration of what might indeed be possible. The ideas of young children may, therefore appear to be less rational or reasonable than "imaginative" ideas of older students.

there are no objective criteria which define imaginative conceptualizations. Drawing again on Barrow's claim that the honorific term "imaginative" implies some criteria against which an idea, a person, or their thinking must be judged, I suggest that within each particular context, whether that of a young child or a nuclear physicist, imaginative thinking is defined by criteria relative to the individual's knowledge and experience, but also by general criteria of coherence, relevance, truth and validity. Imaginative thinking therefore, is a particular utilization of the power of imagining which enables an individual to produce conceptualizations that are unlike previous ideas, and which are qualitatively different from the obvious or mundane, from the nonsensical or fantastical, from the ineffective and the uninformed.

Thinking imaginatively enables the individual to generate conceptions that are possibilities which have been refined into effective solutions to challenges and problems. As such imaginative thought is refined, reasonable, comprehensible and coherent. The possibilities that it generates are unusual, yet consistent with existing knowledge, they do not violate social or ethical norms[4], and they have recognizable and justifiable effectiveness within that particular context and domain. Imaginative thinking is, therefore, governed

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[4] Karen Hanson points out that the imagination "can wretchedly wander" (1988, p.139), and can "picture new forms of degradation and subjection" (ibid, p.138). While imagination and imaginative ideas are generally seen to be a good thing, she suggests that imagination has no inherent goodness. Regardless of the degree of inventiveness, the various forms of torture used by the Spanish Inquisition are rarely described as imaginative in any honorific sense.

by commonly held expectations for coherence and reason, and is necessarily informed by existing knowledge and defined by criteria for validity in that domain or context.

I will now discuss some features or characteristics of thinking imaginatively in a general sense by, first of all, considering the relationship of imaginative thinking to knowledge. I will then consider the relationship of imaginative thinking to rationality and to ways in which the value of conceptions are verified. In this I will draw on philosophical accounts of imagination, and, to some extent, on information derived from the study of creative thinking. This, I believe, does not invalidate the points that will be made. Imaginative conceptions are not necessarily creative conceptions, but some creative discovery clearly does involve some degree of imaginative thought. Where I believe it is both relevant and appropriate I have inferred points from such accounts.

Imaginative thinking and knowledge

Barrow points out that thinking imaginatively about a topic logically presupposes adequate knowledge. Individuals, he states, "cannot show imagination if they have poor understanding" (1988, p. 87). An imaginative choreographer, for example, begins her innovations with knowledge of previous dances, knowledge of movement and dance forms, with an

understanding of what the dance is meant to convey. She may be further influenced by a new understanding she has acquired, for example the influence of Asian art and Balinese dance on the compositions of Martha Graham. An imaginative advertisement reflects the designer's knowledge of audience response and the possibilities that the chosen media offer. Being able to think imaginatively about a topic is not based on inadequate, inappropriate, or erroneous suppositions or guesswork, or uninformed and random searching. The ability to imagine alternate or varying possibilities requires some significant degree of competence, knowledge, and understanding of the topic. This does not, however, suggest that having more knowledge necessarily means that an individual will be more imaginative. As noted by Egan, "Knowledge is a necessary but not sufficient condition for imaginative activity" (1992, p. 155). As stated by Bailin, however, "it is increased knowledge and expertise in some area which facilitates creative solutions to problems" (1994, p. 106).

Weisberg's study of scientific and artistic creativity suggests that, in contrast to common suppositions imaginative ideas are entirely different or unprecedented, "even the most radical advances began in continuity with the past, as variations on old themes" (1993, p. 239). Although thinking imaginatively might produce ideas which are different, unusual or which diverge from existing thought, they are typically not entirely unrelated to

preceding or conventional ideas. New conceptualizations, Weisberg claims, can usually be described in terms of continuity and discontinuity with antecedent ideas, and the evolution of a new idea can almost invariably be traced to influential sources and to incidents or elements that catalyzed a new approach to the question. As noted by Emerson, a great genius is the most indebted man. In some cases the "building on" previous ideas is conscious and explicit. Martha Graham, for example, in describing the source of her ideas, said,

> I am a thief - and I am not ashamed. I steal from the best wherever it happens to be - Plato, Picasso, Bertram Ross. I am a thief and I glory in it. I steal from the present and the glorious past - and I stand in the dark of the future as a glorious and joyous thief - there are so many things of the imagination to pilfer
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> 1973, p. xi

In other cases, the connections between imaginative conceptions and preceding ideas are more subtle or less consciously recognized or "realized" as Perkins describes the abrupt understanding of "things falling into place" (1981, p. 60). However, the notion of a totally unprecedented idea derived in some mystical kind of way, claims Weisberg, is fundamentally unfounded.

An individual's consideration, development and refinement of imaginative conceptions is founded on what the individual already knows, and is also informed by the individual's knowledge of the constraints that the topic or subject may impose. An imaginative dance, for example, must meet

certain criteria implicit in the nature of the endeavor, whether they be aesthetic or technical. Imaginative conceptions, whether in arts or science, suggests Bailin (1994), are constrained by the rules of the discipline. The individual must, therefore, have judgment and skill in applying these rules to the selection and refinement of ideas. Thinking imaginatively is not random, not uninformed, nor irrational, but is clearly related to the degree of knowledge and understanding the individual possesses about the topic and the constraints that the field or enterprise imposes, and the way the individual draws on, and applies that knowledge.

Imaginative thought does not occur in an intellectual void, neither does it occur fortuitously, accidentally or entirely randomly. A number of historical and anecdotal accounts have described unpredictable, sudden, and seemingly serendipitous ways in which imaginative ideas have struck an individual's mind. Newton, Darwin, Poincaré, Einstein, Mozart, Coleridge and many other great thinkers have reported intuitive flashes of insight (Rugg, (1963), Shepard, (1988)). Weisberg (1993), however, challenges the myth of mystical or miraculous acts of inspiration or genius. The generation of a novel idea, Weisberg claims, is neither isolated nor entirely spontaneous. It is the result of a conscious and critical process related to the knowledge, ideas and achievements that have preceded it. New conceptualizations, while frequently described as presenting themselves in "flashes of insight"

(Rugg, 1963, p. 6), or as "realizations" of things falling into place (Perkins, 1981, p. 60), are, nonetheless, typically preceded by periods of purposely seeking solutions to a question, problem or paradox. There is a conscious, deliberate and often onerous period of preparatory thinking. What is described as intuitive insight may have been triggered by new information, or catalyzed by new combinations of information, or new ways of viewing the topic (Weisberg, 1993).

It is clear that no simple relationship between knowledge and thinking reflects the complexity of imaginative thinking, despite Weisberg's skepticism about the myth of genius and his claim that, rather than being a different form of conceptualization, imaginative creativity may be described simply as an excellent use of ordinary intellectual capabilities. We might describe factors that appear to be logically associated with the achievement of extraordinarily imaginative thought by some individuals, but we cannot describe a simple and clear causal relationship. As stated by Scheffler, "there is no mechanical routine that guarantees success in the search for explanatory theory" (1991, p. 15). It appears, however, that imaginative thinking is generally a well informed, disciplined, consciously focused and purposive activity of the imagination. It can also be suggested that while it is acknowledged that individuals possess imaginative potential to greater or lesser degrees, that imaginative thinking is never uninformed, casual or

haphazard. Pasteur, commenting on the apparent "inspiration" of his own discovery, noted that "chance favours the prepared mind" (cited in Weisberg, 1993, p. 79).

Imaginative thinking and rationality

As the review of imagination in Chapter Two indicated, the academic opposition, or at least, separation of the intellectual modes of rational inquiry from imaginative thinking or intuitive insight, has been particularly persistent in Western philosophy, and indeed in Western culture and education. There has been a long standing "academic tension between reason and imagination", notes Stevens (1951, p. 153). This is a tension evident in Pascal's view that imagination is the "deceptive element in man, the mistress of error and duplicity" (ibid, p.133). In addition to the inherited suspicion of the validity and integrity of "imaginings", there is a marked contrast between the presumed systematic logical progression of thoughts, inquiry and explanation which characterizes rational thought and the complex, analogical, narrative, non-discursive or metaphorical thinking which has been thought to characterize imaginative thought. These two modes of thought are generally regarded as dichotomous and mutually exclusive.

Egan, however, suggests that "identifying imagination as the capacity to think of something as possibly being so certainly does not suggest any conflict

with rationality" (1992, p. 42). He states, "the ability to hold alternative conceptions in the mind and assess their adequacy or appropriateness would seem a necessary component of any sophisticated rational activity" (ibid, p. 42). While this may be the case, it is not altogether clear that the reverse might be true. Is rationality an essential component of any activity involving thinking of things as possibly being so? The answer to this is probably, "no". Not all things one might think of as possibly being so might be described as rational. For instance, ideas which are incoherent, bizarre or fantastic may be non-rational or totally irrational. Rationality is, however, an essential component of imaginative thought, or thinking imaginatively as I have defined it. Worthwhile, purposeful, and justifiable conceptions are selected and refined from all the possibilities, the raw material, that the imagination generates. "Reason", suggests Stevens, "is simply the methodizer of the imagination" (1951, p. 142).

Imaginative or creative discovery is not, however, simply a process of first imagining and embellishing a number of unusual possibilities and then selecting from the options. This characterization, as pointed out by Egan, is clearly not a literal description of the relationship between the generation and selection of fruitful ideas (1992, p. 37). The relationship between the formulation and refinement of ideas is both interactive and complementary "rather than being characterized by phases of imaginative generation and

subsequent mechanical execution" (Bailin, 1994, p. 123). The artist, suggests Scheffler, constantly generates, evaluates and reshapes ideas. An interplay of imagining, evaluating and reasoning, permeates every stage of the artist's work. "The results of his every move requiring fresh evaluation and a reconsideration of basic directions" (cited in Bailin, 1994, p. 123). The interplay of imagination and reason suggested by Stevens (1951), Egan (1992) and Bailin (1994), is also described in accounts of the creative imagination in the process of scientific discovery. From "a kind of 'analog' simulation of possible events in the world", suggests Shepard, the scientist refines, verifies and explicates his hypotheses, his imagined possibility, in a logical and rational manner (1988, p. 180).

The verification of imaginative insights or hypotheses in the field of science depends ultimately on the application of rational inquiry and examination. Bruner points out that, although the "good intuitive scientist proceeds up his abstract mountain" with the aid of imaginative or metaphoric crutches, "his object is always to convert those dense metaphors into the transparent, frangible hypotheses of science - or into testable axioms that will generate hypotheses that, with luck, may be tested" (1986, p. 52). It would, however, be erroneous to imply that linear-rational investigation alone establishes the validity of ideas. Bruner points out important distinctions between the ways in which scientific intuitions are verified and

rationalized and the ways in which insights or creations in the arts and humanities achieve verisimilitude. Science seeks to establish invariable truths and is, therefore, limited by the particular constraints of the logic of its forms of testability and by the necessary universality of its findings. The humanities and the arts, however, search for truths that are "true to conceivable experience" (ibid, p. 53), and fit different human perspectives. The plausibility of imaginative thought or creation in the arts and humanities is established in ways that are fundamentally different from the logical inquiry that establishes scientific veracity, and the effectiveness of an innovative play or a painting, for example, is established differently from the effectiveness of an imaginative scientific theory. Nonetheless, an imaginative conceptualization, regardless of its field, must be expressed and understood in sensible and appropriate forms of explanation or demonstration. Imaginative thinking in all areas of endeavor, produces ideas which may be different, unusual or innovative, but it is reasoned thought.

I have to this point focused largely on the role that imaginative thinking plays in enabling an individual to generate new understandings and to think of new ideas. I want now to express this capability in terms of its involvement in other activities. Thinking imaginatively is involved in a number of other activities or processes that require an individual to think of possibilities other than those immediately apparent and to refine ideas into

workable conceptions. It enables the individual to project beyond what currently exists to plan and project, to imagine new configurations of information, to imagine possible outcomes and to generate hypotheses. Imagining other forms of expressing conceptions or presenting ideas enables the individual to design and create. The ability to imagine the possible underlying reasoning enables the individual to interpret another's thoughts or representations of concepts, and combining varied information into possible configurations enables an individual to infer meanings not immediately apparent. Imaginative thinking enables people to separate themselves from their own views to consider other views and other experiences and to understand and empathize with another's experiences, perspectives or opinions. The ability to imagine other possibilities against which a conception might be assessed enables an individual to judge its value or to evaluate its validity. Imaginative thinking enables individuals to carry out many intellectual activities which have been described in various taxonomies, such as Bloom's hierarchical schema (Bloom, 1956), as representative of higher order thinking in that it moves beyond the literal, the simple recounting of existing views. Bruner, indeed, suggests that all intelligent thought presupposes the ability to look beyond the given (in Bailin, 1994, p. 74).

Summary

Imagination is the intellectual capacity that enables individuals to imagine, to think of things as possibly being so, as other than they actually are. Individuals may imagine multiple perspectives, and rich and detailed possible options. **Imaginative thinking** is a particular utilization of the power of imagining which produces knowledgeable, refined, coherent and comprehensible conceptualizations that express new, unusual and workable ideas. Thinking imaginatively presupposes some accurate and appropriate knowledge from which the mind can draw - a knowledge of the context, an understanding of the nature of the problem or question, an understanding of the constraints limiting the range of reasonable possibilities. Thinking imaginatively is an informed, conscious, disciplined, and focused exercise of the imagination. It is not synonymous with pretending, playing, supposing, visualizing or creating, although thinking imaginatively may form part of such activities.

I have suggested that, while imaginative thinking may play a role in the creative process, it also enables the individual to generate ideas that express reasoned and reasonable possibility in a variety of contexts. Imaginative thought may take a variety of forms ranging from the creation of an inspirational painting, to a critical assessment of the value of a politician's statement, to a solution to a fairly mundane or everyday problem. I suggest,

therefore, that, imagination plays an important role in the intellectual life of the individual, both as a means of personal understanding and expression, and as a feature of independent, intelligent thought. I also suggest that exercise and development of the capacity to think imaginatively is implicit in conceptions of the educated person, and that the role of the school is, therefore, to promote the development of both the students' abilities to use their imaginations to think of possibilities, as well as to develop the capacity to reason and to refine those ideas.

Implicit in this claim, however, is the assumption that all students have some imaginative capabilities that might be utilized and developed, and that being able to think imaginatively is not simply evidence of the particular giftedness of an individual, or indicative of a mind construed in a particular manner, but is an aspect of each individual's intellectual capacity. It is also implied that imagination, as an innate intellectual capability, is a feature of an individual's intellectual makeup regardless of age, despite the rather common view, possibly furthered by young children's observable and explicit imaginative lives, and theories, such as those of Rousseau (Boyd, 1976), Bruner (1964) and Piaget (1926), which suggest that imagination precedes the development of reason, and that imagination is rather less a feature of the intellectual lives of older students than of younger.

In the following chapter, I will begin to explore these assumptions by considering the imaginative capabilities of the 15-18 year old, those typically in the final years of formal, public schooling. I will discuss the nature of thinking of students at this age, and consider their capacity to imagine, to think of possibility, and to generate worthwhile imaginative conceptions. I will then consider what value there might be in encouraging imaginative thinking in students at this age, and how it might relate to goals for their education. I will then discuss the particular characteristics of 15-18 year old learners that might be taken into account when engaging the imaginative interest and designing imaginative tasks for these older students.

Chapter 4

THE 15-18 YEAR OLD LEARNER

A review of the intellectual and imaginative capacities of the adolescent

> Puberty is the birthday of the imagination. This has its morning twilight in reverie, and if brilliant and vivid, supplements every limitation, makes the feeble athletic, the beggar rich, knows no limitations of time or place, and is, in a word, the totalizing faculty
>
> Hall, 1904, v.1, p. 313

The 15-18 year old individual is in the transitional stage between childhood and adulthood, in the period known as adolescence. This is a stage of life distinguished by rapid physical maturation, by improving capacities to reason about complex and abstract issues, and by increasing independence. These changes allow the individual, for the first time, to begin to synthesize their experiences and beliefs into an autonomous identity and to exercise some degree of intellectual independence. Although it clearly has some biological basis, adolescence, as we understand it, is thought to be as much a cultural invention as a biological phenomenon (Esman, 1990). It is generally believed that social, as well as developmental factors, influence or define

adolescents' behavior and beliefs, the way they view the world, and the way in which they interpret and organize experiences. Before discussing features of the intellectual and the imaginative lives of 15-18 year old individuals, and the role that imaginative thinking might play in their education, I will briefly explore the nature of our conception of adolescence, and then review the more significant or formative theories which describe the patterns of thinking of individuals within this general stage.

Adolescence

G. Stanley Hall, often called the father of the scientific study of adolescence, published the first comprehensive account of adolescence in 1904. Heavily influenced by Charles Darwin, Hall defined adolescence as a developmental stage determined largely by genetically determined physiological factors. Hall's publication, *Adolescence and its Relation to Psychology, Anthropology, Sociology, Sex, Crime, Religion, and Education,* depicts adolescence as a highly problematic period of the human life cycle, influenced to some minor extent by environmental influences, but essentially biological in nature. He portrayed adolescence as a period of mood swings and intense turbulence reminiscent of an ancient period of storm and stress (Hall, 1904). The adolescent Sturm und Drang reflected idealism, passion, and revolution, and found a parallel in Goethe's *Sorrows of Young*

Werther (Esman, 1990). These early accounts by Hall, and later psychoanalytic descriptions of the abnormal "developmental disturbance" of adolescence are still reflected in persistent stereotypes of adolescents as confused, highly stressed or disturbed (Esman, 1990), and adolescence as a problematic stage of life characterized by somewhat peculiar attitudes and aberrant behaviours.

Although many of the characteristics of adolescence are clearly related to biological changes, it is also argued that our current conception of adolescence is a sociohistorical creation (Elder, 1975). In *Archetypal Patterns of Youth*, Eisenstadt states that all cultures define youth as a period of transition from childhood to adulthood. No longer a child, but not yet able to fulfill adult roles, the youth is at the stage in which, "the individual's personality acquires the basic psychological mechanisms of self-regulation and self-control, when his identity becomes crystallized" (1963, p. 26). The concept of youth is a universal phenomenon, he states. It is primarily a biological phenomenon, "but one always defined in cultural terms" (ibid. p. 24). In contrast to primitive societies, notes Werner (1948), where there is often an abrupt break between the social expectations of roles in childhood and adulthood, in more advanced cultures "there is a slow, long-lasting plastic transformation from one stage of life into the other because of the intimate, interdependence and interaction of the life patterns" (1948, p. 27). In North America, sociohistorical factors since the early part of the twentieth

century such as the decrease in apprenticeship, compulsory public education, the upgrading of specialized skill requirements of labor, and child labor legislation have extended the period of dependency and transition (Santrock, 1993, p. 492). This significant gap between childhood and the young person's entry into adulthood has created a distinct adolescent subculture, "almost a way of life between childhood and adulthood" (Erikson, 1968, p. 128), characterized by distinctive patterns of behavior, interests, and patterns of thought. In adolescence, suggests Erikson, individuals are accorded a psychosocial moratorium, "a period which is characterized by a selective permissiveness on the part of society and of provocative playfulness on the part of youth" (ibid, p. 157), allowing time and opportunity for the individual to mature physically and intellectually, and to establish a distinctly personal identity.

The theories that have provided the foundations for current views of the adolescent mind, and those that have been particularly influential in defining our conception of adolescent thinking, are those of Jean Piaget and Arthur Erikson. Piaget's theory of cognitive development explains adolescent thinking in terms of a largely biologically determined developmental stage. Erikson's psychosocial theory of development explains the characteristic behaviors, beliefs and thinking of adolescence, not simply in biological terms, but in terms of the effects of the interaction between the

individual's own development and the changing demands of their social context.

Piaget suggests that cognitive development progresses through distinct stages. Individuals pass through these stages in an invariant sequence with only slight variations in the rate at which individuals in Western industrialized cultures attain each new stage. Cognition at each stage is qualitatively different from the preceding stages, and the movement from one stage to the next is promoted by "disequilibrium", the failure of the individual to continue to accommodate newly assimilated information within the existing cognitive structures. The biological and psychological changes that accompany puberty combine with increasingly challenging intellectual demands in early adolescence to initiate the transition to a higher level of cognition.

Piaget describes the changes in thinking in adolescence as a move from concrete operational thought, which is anchored in concrete experiences and which characterizes the thinking of children between the ages of approximately 7-11 years, to the more abstract formal operational thought of the mature adult. Neimark (1975) explains,

> the elements of formal operational thought are abstract in the sense that the truth value of a statement can be freed from a dependence on the evidence of experience and, instead, (be) determined logically from the truth values of other propositions to which it bears a formal, logical relationship
>
> cited in Lerner and Spanier, 1980, p. 247

The adolescent's thinking, therefore, is free of the constraints of real or concrete experience, and the individual is able to deal with more abstract concepts, and to reason about issues in abstract, propositional, or hypothetical terms. This, Piaget claims, enables the individual to reason in the hypothetical-deductive mode of formal, logical scientific reasoning. It also enables him or her to weigh other possibilities and points of view in making decisions, to be more critical, and to solve problems more rationally. Formal operational thinking enables the adolescent to consider more complex concepts such as those of a theoretical, philosophical, or ideological nature, and to deal rationally with moral dilemmas - to exercise, what Piaget called "autonomous morality", and to function at the higher levels of moral reasoning described by Kohlberg.

Piaget suggests that while the onset of formal operation thought occurs by the age of 12, consolidation of full operational thought might continue to take place throughout adulthood. Broughton (1983) has suggested that this final cognitive stage in Piaget's developmental theory might be more accurately described as being composed of two sub periods - early formal operational thought and late formal operational thought.

> In early operational thought, adolescents' increased abilities to think in hypothetical ways produces unconstrained thoughts with unlimited possibilities. In this early period, formal operational thought submerges reality, and there is an excess of assimilation as the world is perceived too subjectively and too idealistically. Late formal operational thought sees a restoration

> of intellectual balance. Adolescents now test out the products of their reasoning against experience and a consolidation of formal operational thought takes place. An intellectual balance is restored as the adolescent accommodates to the cognitive upheaval that has taken place
>
> Santrock, 1983, p. 529

While many young adolescents are beginning to think in a formal operational manner, it often takes the form described by Kuhn, Langer, Kohlberg, & Haan(1977) as emergent formal thought, and by Broughton (1983) as early operational thought. Students use formal thinking inconsistently, reasoning in abstract ways in some areas, and in concrete operational thought in others. By late adolescence, Santrock suggests, "many adolescents are beginning to consolidate their formal operational thinking, using it more consistently" (1983, p.530). The achievement of late formal operational thought, however, does not appear to be universal. Large variations occur among the general population with respect to their ability to function at the late formal operational level, and variations may also occur within individuals across different content areas (Lerner and Spanier, 1980, p. 250). Nonetheless, Piaget's theory places far less emphasis on environmental factors, the educational or social influences on the individual, than on the changes within the individual him or herself. Developmental rather than environmental influences account for the major changes in patterns of adolescent cognition, and the variations among individuals.

Behaviorist and information processing theorists, however, claim that differences between children's and adolescents' thinking can be explained largely in terms of environmental factors. The more sophisticated thinking of adolescents can be described in terms of increased skill and knowledge which have been accumulated over time. Improvements in cognitive functioning, therefore, are time, rather than age related, and are not determined by invariant developmental stages. Students simply learn to become better thinkers.

Cognitive psychologists currently classify the major advances and developments in how the adolescent thinks into four major categories; the ability to think about possibilities, to think through hypotheses, to think about abstract concepts, and to think about thought itself (Keating, in Steinberg and Belsky, 1991, p. 450). Thinking about possibilities entails the ability to move easily between the concrete world of experience and to think in terms of possibilities, and of options. It takes the form of speculative "what if" thinking, and is the basis for the adolescent's increasing ability to debate, and to argue. Thinking through hypotheses entails the ability to project the outcome or the consequences of many possible actions. It forms the basis for the adolescent's increasing ability to reason, to plan and to make informed and reasoned decisions. The ability to think about abstract concepts enables the individual to consider more complex and conceptual issues such as

political ideologies, scientific concepts, and the nature of human existence. Thinking about thoughts relates to the adolescent's increasing awareness of his or her own thought processes, and it is involved in the conscious use of cognitive strategies, and also in the increasing introspection and intellectualizing that characterizes adolescence (Steinberg & Belsky, 1991). In several respects, the intellectual capabilities described by Piaget, Keating and Broughton, are very similar to those associated with imagining, thinking of possibility, as described in Chapter Three.

Arthur Erikson suggests that changes in thinking in adolescence are not determined simply by biological or environmental factors, but are also influenced by psychosocial factors. Erikson's theory of psychosocial development defines eight distinct developmental stages during an individual's life. At each stage changing social challenges faced by the individual create a turning point, a crisis which the individual must resolve. The challenge during adolescence is that "young people must become whole people in their own right" (Erikson, 1968, p. 87). They must balance their own individual potentialities with the expectations of society and achieve a sense of inner identity. Failure to do so creates a sense of "role confusion" (ibid, p. 87).

Erikson considered Piaget's views of adolescent cognition to be complementary to his view that adolescence is characterized primarily by the

search for identity. Formal operational thought, he states, enables the adolescent to "think of possible variables and potential relations" (1968, p. 245), from these, the adolescent makes "a series of ever-narrowing selections of personal, occupational, sexual, and ideological commitments" (ibid, p. 245). The adolescent's ability to think of a wide range of possibilities and to explore a wide range of options, however, is problematic and bewildering, and the adolescent's search for a new and reliable identity is seen,

> in the persistent adolescent endeavor to define, over define, and redefine themselves and each other in often ruthless comparison, while a search for reliable alignments can be seen in the restless testing of the newest in possibilities and the oldest in values
>
> Erikson, 1968, p. 87

Until a sense of inner identity is found, Erikson suggests, the adolescent mind, "becomes a more explicitly ideological one ... searching for some inspiring unification of tradition or anticipated techniques, ideas, and ideals" (ibid, p. 130). There is a tendency for adolescents to look fervently for ideologies to believe in, and idols to put their faith in (ibid, p. 130). This can be seen in adolescents' susceptibility to the influence of cults or religions, gangs, charismatic leaders, and radical political ideologies (Esman, 1990). The adolescent, it appears, is willing, "to put his trust in his peers or those leading, or misleading, elders who will give imaginative, if not illusory, scope to his aspirations" (Erikson, 1968, p. 128).

In adolescents' attempts to impose a unifying theme or interpretation on their experiences, they often reduce complex political and social issues to simple, moral ones (Adelson, 1975). Adolescents tend to adopt absolute ideological positions, and develop "a firm and categorical system of beliefs, that knows no doubt, admits no uncertainty" (Esman, 1990, p. 86). The world is viewed in Utopian terms, and adolescents may demonstrate intolerance and contempt for contrary positions. The totalistic quality of adolescent thinking and their "egocentric and narcissistic orientation determined to adapt the world to itself" (Erikson, 1975, p. 204), often means that adolescents are totally preoccupied with themselves, and they perceive themselves as unique and invincible. They have a secure sense of knowing "the truth".

Erikson describes characteristics of adolescent thinking in terms of individuals' attempts to understand their relationship to the society they now see themselves as part of, to understand how their experiences can be generalized to the greater whole, and to perceive the underlying patterns, structures or general laws that control and explain the world and themselves. His observations of the over-generalizations that characterize adolescent thinking and the totalistic nature of adolescent beliefs find some parallels in descriptions of the characteristics of early operational thought proposed by Broughton (in Santrock, 1993, p. 529), and in Egan's Philosophic Stage of educational development (1979).

Egan suggests that, in early adolescence, up to the age of 14 or 15, students are at the stage of Romantic understanding. This stage is characterized by the child's recognition of the outside world as no longer "an extension of the inner self" (1979, p. 29). Students now become interested in gathering information about the world, and developing a "sense of its scope and scale" (ibid, p. 51). During the Philosophic Stage, from roughly age, 14/15 to 19/20, students attempt to place some order on the facts and information they have about the world. This stage is one of searching for ordering schemes, generalizations and laws that will help the individual understand how the world functions, and explain their relationship to that world. When they "know their proper place and roles, ... they will securely know themselves", states Egan (1979, p. 51). Egan echoes Erikson's observations of the categorical and highly generalized nature of the schemes adolescents often develop in their search for explanatory theory. Egan, however, suggests that the refinement of such schemes, and the subsequent attainment of the Ironic Stage of development, a stage which has rough parallels in Broughton's late formal operational period and in Plato's "noesis", the "state of mind called intelligence or rational intuition " (Cornford, 1968, p. 223), is dependent more on the acquisition of further knowledge and understanding of the "richness and complexity of reality" (Egan, 1979, p. 82), rather than simply being a factor

of the achievement of an inner identity, although the two may clearly be related.

The theories of Piaget and Erikson, while still highly influential, are not considered to present entirely full or accurate accounts of adolescent thinking, and each has been challenged to some extent. For example, the achievement of formal operational thought in late adolescence or early adulthood is not believed to be related to biological development alone. Other factors such as education, experience and intelligence are also thought to influence an individual's intellectual development. The cognitive functions that define formal operational thought, as defined by Piaget, are not considered to represent a complete range of human intellectual capabilities, and the purity of his methodology has been questioned. Achieving a sense of inner identity, suggested by Erikson as a major factor in adolescent behavior, is not thought by many to be as harrowing, or as cataclysmic as Erikson's term "crisis" implies. Neither is identity formation thought to occur simply within the adolescent years, but is a longer, more gradual process (Santrock, 1991, p. 585). Notwithstanding differences among the underlying explanations, or some deficiencies in the explanatory theories, these accounts do provide somewhat complementary pictures of adolescent cognition as being qualitatively different, and certainly more mature than that of children.

All accounts reflect the adolescent's increasing ability to think in more complex, abstract, theoretical and reasoned ways.

Adolescents, however, are not characterized simply by their acquisition of more conceptual and formal ways of thinking, and an increasing technical proficiency in developing comprehensive schemes to order and understand their world and their experiences. Although cognitive psychologists and educational theorists have described adolescents as generally more logical, more rational, more deductive, and more objective in their thinking, adolescents also have an immense propensity to play mental gamesmanship, to toy with concepts (Barell, 1980, p. 122), and to engage in imaginative activity (ibid, 1980). They also have a tendency to fantasize, to daydream, and to ascribe a great deal of significance and credence to what they imagine might, or should, be possible. In these respects they are neither like the typical adults they will become, nor like the children they have been. To develop a more inclusive picture of adolescents, how they think, what imaginative capabilities they might have, and what might pique their imaginative interest, we also need to understand something of their more private worlds, the nature of their imaginative lives, their interests, their values, and their attitudes.

Play, fantasy and make-believe play a significant role in the intellectual lives of young children, but although adolescents' thinking becomes

increasingly adult in many respects, the tendency to make-believe that we associate with younger children's imaginative lives does not decline during adolescence. "Social pressures force the internalization of ... make-believe play" (Singer, 1975, p. 150), and as indulgence in childhood play declines, indulgence in fantasy increases, reaching a peak in late adolescence (Klinger, 1971, p. 30). In *The Inner World of Daydreaming,* Jerome Singer suggests that, during adolescence, imaginary worlds and possible roles may be played out in plays or movie making, in watching movies, in identifying with pop idols, movie stars or other adult roles, and, most frequently, in the form of daydreaming, which he also observes, reaches a "peak of frequency within the period between fourteen and seventeen" (1975, p. 150). Singer, however, notes that,

> While there seems little question that much adolescent daydreaming has a truly fantastic quality and involves many possibilities that are unlikely to materialize in the life of a given individual, there is good reason to believe that most daydreams in this period are preparations for future behavior
> 1975, p. 151

Daydreams and fantasies during mid to late adolescence lose something of the adventure and spirited action that characterized the fantasies of younger individuals, and they become increasingly focused on social, romantic and sexual issues, and on possible future achievements (ibid, p. 151). The adolescent, says Singer, manages the "greater complexity of social competence" through imaginary role playing (ibid, p. 153). Adolescents are

generally heavily influenced by the pop culture, which induces some degree of conformity in the possible worlds, identities and roles that they explore, but their daydreams become increasingly realistic, and more shaped and constrained by the individual's own interests, skills and aptitudes as the adolescent moves towards adulthood. Singer, however, notes that,

> the gap between possibility and probability has narrowed somewhat in adolescence... but the gap is still a big one, and there is room for a great deal of wide-ranging hopeful make-believe in the period between thirteen to eighteen in our society
>
> 1975, p. 153

This "hopeful make-believe" is apparent in the optimism, the idealism, the lack of a sense of vulnerability and the sense of uniqueness experienced by adolescents. It also reflects the "selective permissiveness" that Erikson (1968) suggests our culture allows for adolescents to play with possibility as they begin to explore and define their own identities.

As adolescents' own particular aptitudes become more clearly defined, and their interests stabilize, their participation in a large number of varied organized games and sports tends to decline. Adolescents tend to select those activities they enjoy and are relatively successful at, dropping those which they perceive to be of little value, or provide no sense of achievement or status. Activities that adolescents undertake at this age tend to become less ends in themselves and more the means through which they can earn social prestige, socialize with other young people, or begin to follow interests related

to vocational goals (Ausubel, 1977, p. 273). The adolescent may become more interested in social, world and political events, and the juvenile fiction and adventure stories selected as reading materials by early adolescents are often replaced in later adolescence by more adult fiction, humorous material and factual magazine or newspaper articles. The interest in making and keeping a variety of collections of different objects that characterized early adolescence generally declines and becomes more selective. The adolescent keeps collections that are "related to actual interests and envisaged needs" (ibid, 1977, p. 280), and the 15-18 year old, for example, may collect CD's and tapes, photographs, videotape and video games, jewelry, makeup, souvenirs, athletic programs and so on. Similarly, interest in constructive hobbies such as sewing, pottery, woodwork, model construction, and so on, may decline as the adolescent becomes increasingly critical of his or her own workmanship, and more conscious of an activity's lack of social functionality (Hurlock, 1973). Constructive hobbies that are maintained are again generally related to vocational interests or related in some way to more social necessities.

Adolescents spend greater amounts of time than their younger counterparts in solitary and less structured social activities such as watching television, talking to friends, driving or "cruising" the town, going to dances, listening to music or watching music videos, daydreaming, just "hanging out", and watching movies. Adolescents, indeed, are avid movie goers and

movie watchers, and in fact, make up a significant proportion of the movie watching public. Hughes (1991) suggests that films are of particular interest to young people. They appeal to their quixotic nature, by providing a view of the world as it might be, rather than as it is:

> the moviegoer may give free rein to his or her idealistic imagination and is allowed, even encouraged, to engage in the type of hypothetical, contrary-to-fact reasoning that is so typical of the adolescent
>
> Hughes, 1991, p. 116

Movies also provide adolescents with opportunities to identify with characters, and to develop a greater understanding of human behaviors, motives, strengths and frailties. They also allow young people to discover what, "makes them laugh, what saddens them, what fills them with terror" (ibid, p. 116). The current popularity of horror, thriller, and suspense films, suggests Hughes, is not indicative of "adolescent indifference to human suffering ... but is (also) an indication of adolescents' needs to test their limits" (ibid, p. 116), to take risks, to push their tolerance, and to prove their daring in a society which provides little opportunity for adolescents to face danger, take risks, or to deal with the formal, and often, significant challenges that mark the passage from childhood to adulthood in some cultures.

Changes in cognitive, social, and personal development in adolescence bring accompanying changes in adolescents' attitudes towards school, and

towards the content of their education and the ways that their learning is structured. Most adolescents regard school as largely a means to an end. They appear to be motivated by the need to succeed in school to achieve longer-range goals, rather than by intrinsic intellectual curiosity, although this may be more reflective of the structure and content of current schooling itself, rather than of any innate quality of students at this age. Students become increasingly disdainful of rote learning, and regard it as an "affront to minds that have a greater capacity to perceive and conceptualize symbolic relationships" (Ausubel, 1977, p. 454), and they have little tolerance for the acquisition of meaningless information, material that cannot be related or integrated into more wholistic understandings. Adolescents at the Philosophic Stage, suggests Egan, "become impatient with learning further details" (1979, p. 55), but rather seek to develop a sense of the greater scheme of things. Hall also notes that adolescents "abhor" the dissection of information into small elements, but crave a sense of "large living wholes" (1904, v.2, p. 496). The adolescent mind, he states,

> naturally storms its way to the centre of things with a rapid impetuosity, but the methodaster and the macerator blunt the intuitions, the best thing in youth, drags down thoughts that fly and makes them crawl at a slow senescent pace
>
> v.2, p. 496

"Never is the power to appreciate so far ahead of the power to express," states Hall, "and never does understanding so outstrip ability to explain" (ibid, v.2, p. 453).

As they develop a more adult orientation towards interpersonal relationships, many adolescents become increasingly resistant to the authoritarian practices in schools, and less disposed to accept the authority of teachers (and indeed of most figures of authority). Their attitudes towards teachers reflect concern, not only with their teachers' competence, but with their personal traits and characteristics and qualities, such as teachers' fairness, impartiality, honesty, respect for, and genuine interest in students (Ausubel, 1979, p. 432). This increasing awareness of others' individual qualities also extends to their more insightful perceptions of other people in general. Adolescents are decidedly more mature than younger children in their ability to form understandings of others based on a variety of more subtle assessments or impressions rather than simply on their appearance, role or status. Adolescents, therefore, become increasingly capable of less categorical and more subjective judgments of people, their behaviors and motives, and they are more capable of humanistic understanding, and more given to altruistic behavior (Santrock, 1993). They may also generally demonstrate a better understanding of the abstract principles underlying the social conventions that they hitherto may have accepted quite unthinkingly.

They may also begin to appreciate the subjective nature of many moral, political, ideological judgments, and may begin to make choices or argue positions on a more clearly reasoned basis (Steinberg and Belsky, 1991).

The 15-18 year old learner

Adolescence is a period of immense change and development covering a period of some ten years, and there are clear differences among individuals in the early, middle and late stages of adolescence, typically defined as 12-15, 15-18 and 19-21, although variations in rates of maturation from one individual to another make these distinctions general at best. It appears that, in general terms, by the age of 15, students have developed the intellectual capacity to engage in more complex, abstract and hypothetical thinking than younger children. They are beginning to understand the place of particulars within larger organizing schemes or frameworks, and they are also increasingly aware of connections between the knowledge they may develop in school, the natural and social world, and their own personal experiences. They are more able to appreciate diversity of opinion, and understand the significance of justification or reasoned proof, and they are increasingly able to consider alternatives and judge the validity of competing points of view.

Students are developing greater knowledge and understanding of the world they live in, but they also have a keen sense of possibility, what <u>might</u>

be, and what should be. Broughton has observed that the possibilities generated by adolescents frequently "submerge reality" (in Santrock, 1983, p. 529), and their ideas are often unreasonable or unrealistic. However, the 15-18 year old is increasingly capable of critical thought. They are more able to make evaluations based on sound evidence, to apply logical constraints to ideas, and to make judgments which are more objective than purely subjective. Santrock states, however, that the decision-making of young people "is far from perfect", that there is rather limited transfer of reasoning capabilities from one setting to another (Santrock, 1993, p. 532), and while students are indeed capable of assessing and refining ideas, it appears that they require adequate knowledge of the specific topic or experience of the particular issue, something which they may not have yet fully attained, in order to do so.

The imaginative lives of 15-18 year old individuals are increasingly characterized by a play with ideas, and daydreams of what might be possible, although these are increasingly moderated by a sense of reality. Imagination is used primarily as an exploratory or vicarious way of dealing with issues, thinking of possible alternatives, or predicting likely outcomes. Individuals identify imaginatively with a variety of adult roles. They test their limits, their beliefs, and their values in their imaginations. Students are disposed towards imagining themselves in other roles, in other places, doing many

different things. They imagine possible futures, possible worlds, possible scenarios, possible experiences, and possible explanations for their experiences. As Singer has suggested, adolescents use their imaginations to consider realistic issues and deal with the complexity of their day-to-day experiences, their dilemmas and their choices, and they use their imaginations to explore the various possibilities that they think life might have in store. To use Barell's terminology, they explore the world in the "playgrounds of their minds" (1980).

15-18 year old students show an increasing interest in preparation for adulthood, and begin to depend less on the values and views of peers. As Hall has stated, "there is a new interest in adults, a passion to be treated like one's elders, to make plans for the future" (1904, v.2. p. 453). Students define their own personal and academic interests more clearly, and their interests generally show a particularly egocentric or narcissistic orientation. They show particular interest in subjects such as psychology, literature, sociology, biology, and anthropology, which provide explicit opportunities for them to derive some personal meaning or understanding from the material (Egan, 1969, p. 63). They also show interest in topics which explain underlying patterns or frameworks, or which enable them to make connections between themselves and their social, biological or historical context. These older students have more insightful understanding of the diversity among individuals, the

ideological nature of social structures, and the nature of moral issues, and they are more able to grasp the complexity of the subjective nature of understandings.

Thinking during this period of adolescence is somewhat distinctive, but it appears that its distinctiveness cannot be described simply in terms of a smooth transition from childhood to adulthood during which the individual gradually relinquishes all aspects of childhood thought, and gradually acquires the more factual, more reasoned thinking which is considered to be more characteristic of mature, intelligent adult thought. Students in these final years of formal schooling appear to have fairly sophisticated intellectual capabilities that allow them to reason, to understand the complexity of natural and social worlds, and to comprehend and to begin to acquire significant stores of conventional knowledge. In this respect they are increasingly mature, more adult-like, although their thinking is still rather bound by their somewhat limited experience and knowledge. However, students at this age also appear to have, and indulge, the capacity to separate themselves from what is, or appears to be, to think of other possibilities, other alternatives, and to engage their imaginations in a play with ideas that is perhaps more typically associated with the imaginative play of children, or with particularly creative adults. In combination, these elements may result in the generation of naively absurd notions described by Hughes as "contrary-

to-fact reasoning" (1991, p. 116), or may result in the insightful generation of possibilities which are unbiased by conventional views.

As suggested earlier in the chapter, the perceived contradictions, inconsistencies or inaccuracies in adolescent thinking have been explained in a variety of ways. Broughton, drawing from Piaget's developmental theory, suggests that the more sophisticated cognitive capabilities of students at this age are largely biologically determined, but that the individual's limited success in consistently applying reasonable constraints to ideas can be attributed to a lack of knowledge and experience. Erikson suggests that young people's psychological challenges and their search for an individual and independent identity accounts for many of the confused ideas and much of the bewildering behavior of many adolescents. Singer suggests that the proclivity of adolescents to play with ideas and possibilities is the natural human tendency to play which we see in children, directed into a more reasoned introverted or introspective activity. Hall, in a chapter entitled, "Diseases of the Body and Mind", represents a largely Freudian view, describing the adolescent's imagination in terms of "illusions" (1904, v.1, p. 313) that are either "decomposed" as critical faculties develop, or which become abnormal obsessions in those who cannot differentiate between reality and the "gracious lies of fancy" (ibid, v.i, p. 314).

It is clear, however, that no single factor accounts for patterns of adolescent thinking, and, as pointed out by Lerner and Spanier (1980), any individual theory represents only one of a number of ways of viewing adolescent development and behavior. The improved cognitive or reasoning capabilities of adolescents may well be explained in terms of a combination of biological development and environmental (educational) factors, but it seems that social and psychosocial factors also promote and support what Erikson has called, adolescents' "provocative playfulness" (Erikson, 1968). We have generally abandoned the view acquired from early psycho-analytic theory that the vagaries of adolescent thinking indicates some pathological, abnormal, or aberrant state of mind, and our current understanding of typical adolescence behavior and typical adolescent ideas allows adolescents to indulge their fanciful notions to a fairly considerable extent. Society demonstrates a rather benign, if selective, tolerance of adolescents' tendency to "play" with ideas, roles, dress, behavior, and so on, and overlooks their inconsistent and often puzzling reasoning. Meanwhile it systematically promotes and encourages mastery of more logical and reasoned forms of thinking, and patiently waits for them to "grow up", and to eventually conform to prevailing expectations for adult behavior.

The propensity to daydream, to hypothesize, to think of possibilities, and to think of both ingenious and "harebrained" schemes or opinions,

suggests that the 15-18 year old student is quite imaginative. I contend, in fact, that many of the intellectual acts which cognitive psychologists, sociologists and educators have described as characteristic of adolescent thinking involve imagination. Thinking about possibilities, thinking through hypotheses, (Keating, 1993); generating organizing schemes (Egan, 1979); developing ideologies (Erikson 1968); experimenting with ideas in daydreams, and identifying with heroes, real and fictional characters, and role models, (Singer, 1975), all suggest a strong and active capacity to think of possibility - to imagine, "to think of things as possibly so" (White, 1990, p. 187). The fact that the term "imagination" is not used to account for these capacities possibly reflects an assumption that imagination deals with the fictional or the fantastic, not with the realistic or factual. Developing a character for a short story, play or poem the student plans to write, for example, may be regarded as imaginative, whereas thinking of an approach to solving a scientific problem may simply be regarded as good abstract thinking, although it may involve the student in predicting possible outcomes and playing with a variety of possible approaches in his or her mind. [5]

In Chapter Three, I discussed the nature of imaginative thinking, and established that thinking imaginatively entails thinking of possibilities and refining ideas into worthwhile conceptions. This depends on the ability of

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5. I will return to this point in chapter 6.

the individual to think of possibilities, to select and refine those ideas according to criteria of validity and reasonableness, and to express those ideas in coherent and comprehensible terms. The preceding discussion of the cognitive, imaginative and personal aspects of adolescent thinking suggests that adolescents do demonstrate the capacity to think of possibility. They are also developing the knowledge and the ability to reason in more critical and objective ways, and this suggests that they may be capable of highly imaginative thinking. Combining the adolescent's capacity to imagine with their improving capacity to reason seems to present interesting possibilities for educators to channel these capabilities and engage students in generating worthwhile and workable ideas in the classroom. This, however, raises the question of what, if any, educational value there might be in activities which require students of this age to think of possibilities, and to refine them into imaginative conceptions.

As established in Chapter Three, thinking of possibilities and then selectively refining those ideas into reasonable concepts may take many forms including creative or expressive activities, critical interpretations of concepts, ingenious ideas and so on. Implied or stated in most sets of educational goals is the assumption that education will enable the individual to apply the knowledge and intellectual capabilities developed by their education in a variety of ways to make independent decisions, solve novel problems,

understand and express new concepts and ideas, and construct new understandings. Individuals, it is hoped, will ultimately be able to function independently of immediate guiding authorities such as teachers. Without the capability to apply knowledge in a variety of possible ways, individuals are bound by what can simply be recalled or has been experienced, they are unable to consider alternatives beyond those they already understand, and they indeed are unable to think independently of some authoritative source. The capacity, and indeed the disposition, to think of what might be possible, is not some form of creative, divergent, or whimsical indulgence, but, as established in Chapter Three, is fundamental to most intelligent activity.

As stated in Chapter One, however, the observations by Shepard (1988), and Simonton (1987), suggest that current school systems tend to focus largely on ensuring that students develop significant bodies of objective and disciplined knowledge, but that this appears to promote a degree of conformity among students which seems to limit their ability to be imaginative or critically independent. This suggests that the type of independent and discriminating thinking that it is hoped or assumed that individuals will demonstrate when adult, probably needs to be explicitly promoted, taught, or modeled as part of their education, and in concert with the mastery of disciplined knowledge. It cannot necessarily be assumed that if the school simply provides students with sufficient knowledge and

information during their schooling, that they will then function as independent and imaginative thinkers once they have completed their education. In addition to developing the knowledge necessary to be able to think of possibility, therefore, students also need to develop the ability and the disposition to do so, and in the last years of formal education, as students prepare to take on the responsibility of their own ideas, actions and decisions as adults, the focus on developing this capacity to think of possibility becomes increasingly important.

The final observation I want to make as more of a peripheral or incidental claim, relates to the fairly obvious point that involving students actively in using knowledge and imagination in thinking of possible interpretations, possible reasons, possible outcomes, explanations and so on, may also offer some relief from the "extraordinary sameness of instructional practice" documented by Goodlad (1984, p. 246). The dominant image of secondary schooling, in particular, is still of the teacher lecturing and questioning and students listening, with textbooks as prime authoritative sources (ibid, p. 247). It is not suggested that incorporating ways of promoting imaginative thinking into the classroom will cure much of what ails secondary education, and will necessarily change students' generally negative attitudes towards school, their education and intellectual pursuits in general. In providing some opportunity for students to develop their own reasoned

views, to formulate, test and argue their own positions, to play a more active role in learning, and to develop some confidence and trust in their own intellectual capabilities, education may be perceived by the 15-18 year old as somewhat more relevant, more valuable and more tolerable.

Summary

Contrary to stereotypical views which portray adolescents as essentially disinterested, disenchanted and rebellious learners, concerned only with the immediate practical relevance of material and its instrumental value, I contend that many youthful minds are very curious about the world around them, and that students between the ages of 15-18 have lively intellects. As Hall states, "there is nothing in the environment to which the adolescent nature will not keenly respond" (1904, v.2, p. 453). Students at this age are generally interested in understanding the relationship between what they are learning and its underlying laws or frameworks. They are interested in explanations for natural, social and historical phenomena, and they are also particularly curious about the connections between the material they are learning and their own experiences and aspirations. They seem to be intrigued by the nature and diversity of human experiences, views, behaviors and beliefs, and the varying social, moral and ethical conventions that determine an individual's place, role and behavior within that culture. Most

15-18 year old students are becoming increasingly aware of the subjective nature of much knowledge and the arbitrary nature of many laws and conventions by which the validity of points of view are determined. They are certainly interested in exploring and expressing their own understandings, views, and beliefs.

I also contend that many of the characteristic skills and attributes of the typical 15-18 year old student are generally very compatible with those involved in thinking imaginatively, and that promoting students' involvement in activities that encourage them to think imaginatively is consistent with educational goals and expectations for students at this age. Indeed, it might be argued that education of students at this level should seek to consciously and deliberately nurture the ability to think imaginatively and independently, rather than try, in the words of Henry David Thoreau, to "make a straight ditch out of a free, meandering brook" (in Santrock, 1993, p. 545).

As suggested in Chapter Three, the ability to think of possibilities alone does not necessarily ensure that a student's conceptions are imaginative rather than "harebrained", and imaginative thinking is generally not a random or undisciplined play of ideas. It is focused, informed, purposeful, defined by certain constraints, and related to existing knowledge. This suggests that encouraging students in schools to think imaginatively is not

simply a question of the teacher providing opportunities for their imaginations to "run wild" and assuming that worthwhile imaginative ideas will simply form themselves fortuitously in their minds. Nor, as I suggested in Chapter Three, can it be assumed that imaginative capabilities are being developed by any and all acts of imagining, pretending, supposing or visualizing. If thinking imaginatively is a purposeful, informed and disciplined act, classroom activities that encourage the development of such ideas must be planned and carefully structured around these necessary elements.

In the following chapter, therefore, I will discuss the factors which may contribute to the development of imaginative ideas in the classroom, and I will consider how the elements that support imaginative thinking might be incorporated into a set of general principles or structures to guide teachers in their planning. I will do this first in fairly general terms so that the ideas produced will have broad applicability to teaching at many levels, and I will then draw some conclusions about structuring imaginative thinking in teaching 15-18 year old students to engage and motivate their imaginative and intellectual energy, and to encourage the development of their ability and disposition to think imaginatively.

Chapter 5

THINKING IMAGINATIVELY

possibility in the classroom

Thinking imaginatively involves refining imagined possibilities into workable and reasonable conceptions. Those conceptions might take the form of interpretations, hypotheses, artistic expressions, and so on. In Chapter Three I suggested that imaginative thinking is a deliberate, focused and informed activity, one which blends knowledge of the topic and understanding of realistic constraints with a consideration of what might be possible. In this chapter I will consider the nature of activities which might encourage students to think imaginatively, and the role the teacher might play in planning for, and supporting the students' imaginative explorations. I will propose a structure to guide teachers' planning and provide a very brief example of lessons which are designed to both engage students' imaginations and involve them in thinking imaginatively. Following that I will consider how the particular characteristics of typical 15-18 year old students might inform the high school teacher's planning.

As suggested in Chapter One, development of students' imaginative capabilities does not appear to be considered particularly significant, and typically receives relatively little attention in the majority of typical classrooms. "The typical structures and practices of current schooling", states Egan, "are designed according to principles and priorities which clearly do not consider any sense of imagination very important to education" (1992, p. 46), and current educational practice is heavily influenced by what Maxine Greene has called "a largely technical rendering of the world" (1988, p. 45). Elliot Eisner has also suggested that "the images of schooling, teaching, and learning often reflect a factory view of schooling and an assembly line conception of teaching and learning" (1979, p. 263), and curriculum planning is "essentially a technical undertaking, a question of relating means to ends once the ends have been formulated" (idid, p. 67).

Such approaches frequently translate into a focus on efficient and expeditious methods of teaching certain prescribed bodies of information, on accountability for only the quantity of learning that takes place, and a diminishment of the more human or affective dimensions of learning. Additionally, the focus on process that characterizes a technical view of learning has resulted in the development and use of programs which claim to promote or develop imaginative creativity or critical thinking in students. These have been based on assumptions that distinctive processes of

imaginative, divergent or creative thinking can be identified, isolated and replicated, and that the personal characteristics and behavioral traits often associated with imaginative or creative thought, such as flexibility, willingness to suspend belief, and openness to new ideas, can be taught (Bailin, 1994).

One example of such a program promotes lateral thinking as an alternative to "traditional" forms of thinking. De Bono (1970), the author of *Lateral Thinking,* makes the claim that lateral thinking,

> is concerned with the generation of new ideas. ... breaking out of the concept prisons of old ideas. This leads to changes in attitude and approach: to looking in a different way at things which have always been looked at in the same way
>
> p. 11

Although there may be some general validity in this assertion, and value in some of the techniques he promotes, his claim that setting aside a distinct time to teach lateral thinking is more useful than "trying to gently introduce its principles in the course of teaching some other subjects" (ibid, p. 17), has elicited a significant amount of criticism, and has exposed the inevitable shortcomings and limited success of applying generic strategies to highly specific topics. Barrow has suggested that development of the imagination,

> cannot be seen as the business of special courses or exercises in such things as problem solving, critical thinking, or creativity, because imagination also presupposes understanding of and competence within the specific contexts in which it is displayed
>
> 1988, p. 90

Research findings, indeed, expose the limitations of these programs and indicate that such generic programs generally fail to improve students' thinking in situations where any subject-specific knowledge or skill is required (Keating, 1988, p. 13). In failing to recognize the critical role of subject specific knowledge in creative thinking, Bailin suggests, such programs, have also "resulted in the downplaying of skills and knowledge in disciplinary areas" (1994, p. 129), those very elements which are necessary for the development of creative or imaginative conceptions.

The characterization of learning as a sterile and technical enterprise which does little to engage students' imaginations does not necessarily, or fortunately, reflect the reality of all classrooms. Many teachers bring a more imaginative than purely technical approach to engaging the intellects and the imaginations of young people. Most people's own educational experiences, indeed, would support the claim that while some teachers present curriculum material in a pedestrian, bland, but technically correct way, others engage students' imaginations and truly enliven the subject. Ducharne and Kluender, following observations of outstanding secondary school teachers, suggested that,

> When teaching is artful, one sees a sense of wonder, an excitement in the subject matter, the free play of imagination, a what-if vision of the world, an evoking of the unknown
>
> 1986. p. 43

This "artful" teaching may be attributable, to some extent, to the individual characteristics of the teacher, to his or her personality, charisma, teaching style, "artistry", intelligence or acute intuition. Planning lessons which are likely to involve students in thinking imaginatively about the topic or subject, however, also depends on the potential that the curriculum offers for such thinking, where imaginative thinking might usefully or effectively be incorporated into lessons. It will also be determined, to some considerable extent, by the teacher's own knowledge of the subject[6], and his or her understanding of how it might be taught.

Imaginative thinking and the curriculum

It has already been established that imaginative thinking is not a generic capability that might be applied to any question, but that it is a particular way of thinking about a subject or topic which involves the individual thinking about possible outcomes, possible explanations, possible alternatives, and refining those ideas into reasonable and worthwhile

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6. Lee Shulman's research supports the view that knowledge of the subject is a critical factor in a teacher's ability to find innovative or imaginative ways to present a topic to students (Shulman, 1986). However, he suggests that knowledge of the subject alone does not ensure innovative teaching. Pedagogical content knowledge, the teacher's transformation of subject knowledge into forms that will make the knowledge accessible to students is equally as important. Knowing a great deal about a subject, therefore, is a necessary but not a sufficient condition for imaginative teaching.

conceptions. A student might, for example, think of possible explanations for the changes in the peppered moth of England between 1850 - 1950, by relating knowledge about change and mutation in other species, to the possible environmental changes in England during the Industrial Revolution. Another student might think about the possible visual and emotional impact of combinations of colour and texture in a painting he or she is composing. Thinking imaginatively is, by definition, a means to an end rather than an end in itself. Its educational value, therefore, is determined by the degree to which its outcomes are educationally worthwhile - in its potential for the development of knowledge or greater understanding, or in the development of particular intellectual or imaginative capacities within existing curriculum areas, and within the context of prescribed subject matter.[7] In literature this might take the form of an imaginative interpretation of a character's motives, in science it may take the form of an inventive hypothesis, and in dance it may take the form of expressive choreography.

Thinking imaginatively has been most frequently associated with the arts, and with activities which explore and express human understanding in various forms, in poetry, narrative, music, drama, the fine arts and so on.

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7. It might be argued that the value of thinking imaginatively is not necessarily limited simply to its role in the students' acquisition of objective knowledge, and that development of intrapersonal or interpersonal understandings is an equally educationally valid outcome of thinking imaginatively. This thesis will, however, limit its inquiry to the intellectual or academic value of imaginative thinking.

However, Bronowski (1979), Shepard (1988), Scheffler (1991) and others have pointed out that imagination plays a role in many domains including the sciences, subjects not traditionally associated with imagination. In Chapter 3, I suggested that thinking of reasoned possibilities plays a role in activities such as hypothesizing, judging, evaluating, creating, interpreting, projecting, designing, inferring and empathizing. The student's consideration of reasons for mutation in the peppered moth is not simply a deductive process, but contains elements of imagination - combining information into possible configurations or explanations, assessing the validity of each, and refining a reasoned possibility. As Bailin suggests, "thinking that is primarily directed to the evaluation of ideas is not devoid of imagination. It is not merely analytic, selective, and confined within frameworks" (1994, p. 124). This suggests that imaginative thinking might be involved in most subjects in the school curriculum, in the arts, the humanities and the sciences. Thinking imaginatively may, therefore, be seen in a grade ten student's expressive sculpture, in a grade five student's dramatic re-enactment of a West Coast Native legend, or in the kindergarten student's design of a plasticine boat. We perpetuate the dichotomy between scientific and artistic enterprises, and "do a great deal of harm to children," suggests Bronowski, "when we accustom them to separate reason from imagination" (1979, p. 21).

The degree to which an individual may be able to think intelligently and imaginatively about a topic, problem or question in any particular subject area is dependent to a great extent on the amount of knowledge and the degree of intellectual skill that a student possesses. For example, a child may be able to suggest an imaginative interpretation rather than a literal recounting of Father's actions in *Mary of Mile 18* (Blades, 1971) when he or she is knowledgeable about life in the North, has an understanding of why the rules of the farm are so strict, and has a perceptive insight into the characters' values and reasons for their actions. Similarly, an imaginative hypothesis about the nature of species adaptation presupposes that a student has some knowledge of animal classification, selection and change and so on. It is probable that individuals with equal knowledge will differ with respect to their ability to think of possible answers, explanations and so on, but it is also clear that the potential for imaginative thinking is greatly enhanced the more that a student knows, and the greater his or her skill in giving form to those ideas. This does not imply that knowing a great deal will make a student more imaginative. As suggested earlier, knowledge is a necessary but not sufficient condition for imaginative activity, but, as Bailin suggests, knowledge and skill certainly shape, and inform an individual's imaginative conceptions (1994, p. 129).

This does not, however, necessarily mean that students must first acquire knowledge, and then use that information to think of other possibilities. As pointed out in Chapter Two, the relationship between the development of knowledge and imaginative thought is often interactive and complementary, each is refined and adjusted as new understandings are developed. This relationship contrasts with taxonomic schemes which describe hierarchical distinctions among various orders or levels of thought, and imply that mastery of basic skills and knowledge necessarily precedes the ability to engage in higher levels of thinking - a relationship exemplified in the old adage that, "one must first learn to read before one can read to learn". Gildford's (1987) observations suggest that there may be a danger in assuming that mastery of conventional knowledge alone will necessarily result in the ability or the disposition to use that information imaginatively, and it indicates that these attitudes and abilities need to be explicitly developed in schools in concert with the knowledge that is needed. As Egan has suggested, "the mastery of disciplined knowledge in a range of curriculum areas properly goes hand in hand with imaginative development" (1992, p. 156).

The interactive and complementary nature of the relationship between knowledge and imagination also suggests that developing imaginative thinking in concert with disciplined knowledge is an integral

and ongoing element of a child's education. It needs to take place throughout students' school lives, and students of all ages should be encouraged to think of possibilities and refine those notions into worthwhile ideas. In Chapter Four, I established that 15-18 year old students appear to be well disposed to think imaginatively because they have a demonstrated capacity to imagine - to think of possibilities, and they possess fairly sophisticated reasoning capabilities to perfect ideas. There are, however significant differences among children within the school system in terms of their ages, and consequently their knowledge, understanding, and their capacities for reasoned thought, which I have established is necessary for imaginings to become imaginative ideas, and therefore to lay a legitimate claim to being educationally worthwhile.

Very young children are generally considered to be highly disposed to engage in playful and imaginative explorations, but they are somewhat limited with respect to their knowledge and their ability to deal with complex, abstract concepts. This raises the question of whether the forms that thinking imaginatively might take throughout the school will necessarily vary with the degree of maturity of the child, young children's conceptions possibly being more whimsical or fantastic, and less workable or worthwhile than those of more senior students. Margaret Donaldson (1978) has pointed out that young children are often limited in the intellectual

activities they might undertake more by their lack of knowledge, linguistic skills, or interest than by their intellectual capabilities. Young children can create, can interpret, can hypothesize, can think of possibilities, and, within the limit of their experience, knowledge, linguistic skills, and intellectual characteristics, begin to refine those ideas. This is exemplified in something as fundamental as the young child's acquisition of oral or written language itself. Bronowski suggests that, in using their imaginations in play and make-believe, young children are, "experimenting with situations which are not real, but may become real ... it is the basic activity by which he experiments and, as it were, tries out the shape and feel of the future" (1992, p. 22).

Crafted with the characteristics of students in mind, tasks which involve students in thinking imaginatively as I have defined it, as opposed to simply playing, pretending or fantasizing, may form a part of the young child's learning and continue throughout a student's education. Playing with possibility in early childhood may take the form of experimenting with blocks to see what will make a tower fall or stand, it may be displayed in a grade five student's model of a West Coast Indian long house, it may also take the form of an insightful interpretation or critique of a Hemingway novel by a grade 12 student. Expectations for imaginative conceptions of students at different levels will clearly vary, and will reflect their knowledge

and intellectual capabilities, yet they will be similar with respect to the fact that students will, within those capabilities, imagine what might be possible, and cultivate those ideas.

As the discussion of the 15-18 year old student suggested, the intellectual characteristics of students cannot be described simply in terms of decontextualized, abstract cognitive functions. The distinctive features of the intellectual lives of students at varying ages can also be described in terms of their interests, and those elements of topics, subjects or elements of subjects that attract their imaginative interest. While 15-18 year old students may focus largely on those elements of a topic which provide more explanatory frameworks for their understandings, or are seen as relevant in some way to their own experiences within the world, children at other stages derive interest and significance from other aspects of topics. Egan (1992) suggests, for example, that 8 -15 year old students may show interest or curiosity about the details of a subject, and about the range of extremes and scope of a topic, or they may respond to what is wonderful, awesome, or heroic. A teacher's decision about which elements of a topic offer the best opportunities for students to be imaginative will, therefore, vary according to the individual's knowledge, interest, experience and intellectual achievement. Thinking imaginatively, although possible throughout the school, will take different forms in different subjects and at different levels, and will be informed by

both the characteristics of the students and the nature of the imaginative possibilities the topic offers.

I will now consider how imaginative thinking might be incorporated into school classrooms. The ideas that will be proposed are predicated on the assumptions that thinking of possibility and developing those ideas into "good" ideas, that is, thinking imaginatively:

- takes place in the context of subject matter and may be involved in all subjects in the school curriculum at all levels
- is related to knowledge and develops in an integrated and complementary relationship with objective knowledge, rather than being hierarchically related to, or separated from it
- may be constrained by a child's lack of intellectual sophistication, but is possible within the experience and skill of all children
- may take different forms in classrooms at different levels throughout the school

Imaginative thinking and pedagogical considerations

Setting aside a conventional or current conception and pursuing alternative ideas involves a conscious re-focusing of the individual's intellectual energy and attention. A topic may be quite rich in content and present many opportunities for the students to be imaginatively engaged, but

it cannot be assumed that they will necessarily respond to a teacher's exhortation to "use your imagination" or indeed adopt a critical or imaginative stance unless really motivated or required to do so. Teachers must plan their teaching to specifically engage the imaginations of their students.

Jerome Bruner recounts his memorable experiences at the age of ten with an exceptional teacher who, "made the statement in class, 'It is a very puzzling thing not that water changes to ice at 32 degrees Fahrenheit, but that it should change from a liquid into a solid'" (1986, p. 126), and who then proceeded to generate a sense of wonder in the minds of the students.

> She was not just informing me. She was, rather, negotiating the world of wonder and possibility. Molecules, solids, liquids, movement were not facts; they were to be used in pondering and imagining
>
> ibid, p. 126

Being able to teach in ways that engages children imaginatively means that teachers must be ingenious themselves, that is, both knowledgeable and imaginative in the ways they conceive of how the topic might be presented. Equally important, however, the teacher must consciously employ strategies designed to deliberately encourage students to move from a passive and receptive engagement with the topic into a more active and exploratory role.

It has already been established that the ability to think imaginatively about possibilities is related to knowing "about the right things" (Rugg, 1963,

p. 12), and that students are more likely to think imaginatively about a topic they are well informed about. However, sheer quantity of information, in itself will not generate imaginative ideas. To plan appropriate teaching activities, we also need to know what factors might motivate a student to move beyond the obvious and search for other possibilities. We need to know how activities should be structured, and how students' ideas can be refined into worthwhile and effective conceptualizations. It is also important to know what conditions will support the generation and refinement of imaginative ideas.

There are a number of factors which might influence the individual's desire and capacity to think imaginatively, including the individual's own intelligence, personal characteristics and intellectual interests. I will, however, focus on those elements that the teacher can incorporate into lessons to encourage children to think imaginatively. In Chapter Three, I suggested that imaginative thinking is conscious, focused, informed and refined. In the classroom, this means that the teacher might ensure that students are actively motivated in the sense of being impelled to think of possibilities, rather than being simply interested; that the activities they undertake are structured in such a way as to require that a consideration of possibilities is necessary for resolution of the task; and that the focus of the activity provides criteria and opportunity for refinement of those ideas into

coherent and workable resolutions to the task that has been set. I will explain each of these points and describe how these principles might translate into practice. From these I will suggest a planning structure, and consider the teacher's role in supporting student's imaginative thinking.

There are two ways in which these points might be approached, reflecting what Rugg has called the mechanistic and the organic view of human behavior (1963, p. 312). One explains the workings of the productive imagination in terms of causal relationships among a number of factors which are thought to be related to the generation of imaginative ideas. The other approach, acknowledges the "magical force that forms the bits of pieces from the stuff of mind" (ibid, p. 288), and proposes a juxtaposition of elements that may provide the fertile ground for imaginative thought to occur. This reflects a fundamental belief that there is no technical or strategic process that will guarantee the production of imaginative ideas. The ideas that follow are predicated on the latter view, and they integrate conclusions drawn from the descriptions of imaginative thinking in Chapter 3, and from descriptive studies of creative individuals.

Motivating or initiating imaginative thinking

The first element of imaginative thinking involves the consideration of alternatives to "what is". It may be a conscious and deliberate attempt to

solve a problem which has no simple or immediately apparent solution, such as Solomon's challenge of determining which of two women was the true mother of a child. The search for possibilities might be needed to explain a discrepancy which existing ideas or schemas fail to accommodate, or to provide an explanation for an unusual phenomenon such as the variations among tortoises living on adjacent islands in the Galapagos archipelago. It might be initiated by an individual's wish to adopt a different perspective, such as imagining the life of a slave in the American South, or it may be motivated by the individual's desire to find a unique and compelling form of expression or communication for their own beliefs or experiences. It might result from a curious twist of circumstances, or a metaphorical juxtaposition of elements which provides a window through which a topic or problem might be viewed differently, such as Einstein's *Gedanken*, his well documented thought experiments.

Engaging in an imaginative consideration of what is possible is different from simply recalling, remembering, or relating "what is". It is initiated by the need to find an explanation for a question or problem in the absence of a solution which is immediately apparent, or from a deliberate attempt to negate what is, and look for alternative ideas. The state of certainty about "what is" is somewhat more secure and comfortable than the ambiguity or uncertainty of "what might be", however, and, when faced

with ambiguity or uncertainty, the mind, suggests Rugg (1964), naturally seeks to impose order or to find explanation.

Scheffler (1991) has pointed out that when robbed of the certainty of actuality an individual becomes curious, perplexed, disoriented, or confused. These are cognitive states which are initiated by surprise. This is not the simple surprise of sheer novelty, but the cognitive emotion resulting from the genuine unexpectedness of an event that conflicts with any prior expectations. "Surprise," states Scheffler, "is ... unsettling; it risks the distress of disorientation and the potential pain of relearning" (1991, p. 12). This initial surprise, he suggests,

> may be dissipated and may evaporate into lethargy. It may culminate in confusion or panic. It may be swiftly overcome by a redoubled dogmatism. Or it may be transformed into wonder and curiosity and so become an educative occasion
>
> ibid, p. 14

In the classroom "educative occasions" might arise from a child wondering about whether worms sleep, or why the moon changes shape; being puzzled by an unexpected precipitate in a chemistry experiment; being intensely fascinated about the process of mummification and curious about the Egyptian's underlying beliefs about death. A student might be astonished by another culture's traditions and practices which contradict his or her own beliefs, or be bewildered by two conflicting but equally convincing arguments about genetic engineering, or be curious about how

he or she might convey the despair of poverty in paint or in dance. A student might be confused, puzzled, or disquieted by the strangeness of Picasso's "Guernica" or the parody of Duchamp's work. Disoriented and curious, the mind naturally "seeks to complete the incompleted act", suggests Rugg (1964, p. 297), and "curiosity replaces the impact of surprise with the demand for explanation; it turns confusion into question" (Scheffler, 1991, p. 15). This perhaps finds a parallel in the "teachable moment" recognized by seasoned teachers and part of the folklore of teaching, but regarded as somewhat strangely fortuitous, and, therefore, virtually ignored in teacher training programs.

In order to engage the students' imaginative attention, however, the teacher's planning might include a specific consideration of what a topic contains which might create curiosity, surprise, or cognitive disequilibrium in the students, and the devising of an "educative occasion". The teacher might generate this surprise and curiosity by presenting ideas, puzzles, mysteries, problems and challenges and requiring that the students suggest possible explanations or interpretations rather than relying on the teacher's explanation. Uncertainty could be created in the students' minds by presenting a topic in ways which present contradiction, inconsistency or discrepancy, paradoxes or enigmas. This may cause students to question the views they had previously held, to use their knowledge of the topic to think

of possible interpretations, reasons, solutions and so on. They can then apply their capacity to critically review and refine those ideas, and to reconstruct their understandings.

The first step in planning lessons, therefore, includes the teacher's conscious and deliberate step of deciding what in the topic to be taught will interest[8], challenge or surprise students and create some degree of cognitive disequilibrium, and a desire to know. This will obviously be informed by the nature of the topic, but will also take into account the nature of the students, their cognitive capabilities, their patterns of thinking,[9] and their interests. For example, the curiosity of grade seven students might be piqued by the strange and exotic animals on the Galapagos Islands, particularly the giant tortoises which vary from island to island. A grade eleven student, presented with the same topic, might be intrigued by the relationship of theories of heredity and genetics to their own characteristics and interests.

Structuring imaginative thinking

As Scheffler (1991) suggests, surprise might promote the curiosity which leads to the desire to know or to find out, or conversely it may simply

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8. I will use the term "interest" to refer to the intellectual significance or importance of the topic to the individual rather than its potential to amuse or entertain.

9. By "patterns of thinking" I am referring not simply to the ways in which children are believed to think - in terms of concrete or abstract thinking, for example, but also to what children of various ages think about or choose to derive from what they experience.

lead to confusion or lethargy if there is no opportunity to satisfy the need to discover a satisfactory answer. The teacher, therefore, needs to structure an activity for the students which will enable them to satisfy the curiosity, or the wish to know. Rugg, Weisberg, and Perkins all suggest that the successful generation of a new way of conceiving of a topic is generally not the result of broad searching, or a random exploration of any and all ideas. Most accounts of imaginative and creative thinking describe the deliberate, purposive, persistent concentration of an individual on a clearly defined task. Gutenberg's printing press is one such example, the result of a focused and deliberate attempt to find a mechanical method of printing letters on a page. There are many other such examples which, Perkins suggests, indicates that "discovery depends not on special processes but on special purposes" (1981, p. 101), and I suggest, therefore that the teacher must establish a goal, or a focus for the students' explorations, and, in Perkin's terms, build into the outcomes the "property of originality" (ibid, p. 215) - that is, to explicitly encourage and support the use of imagination in the generation of possibility as a critical element in their thinking.

The teacher must establish what final outcome the students are trying to achieve. As stated in the previous chapter, imaginative conceptions do not simply take the form of products or things that have qualities of novelty or ingenuity. Imaginative thinking might also form part of the generation

of hypotheses, interpretations, designs, judgments, inferences, empathetic understandings of other perspectives and so on. Having created some degree of surprise or curiosity about the variations among the tortoises in the Galapagos Islands, for example, the teacher might wonder, "What might possibly account for these variations? Could a tortoise change its shape if it moved from one island to another? How do you think that tortoises on islands covered with sand dunes and low shrubby vegetation might be different from those on marshy islands? Why might that be? Students may be asked to design a study to investigate possible ideas, to gather information necessary to support or refine their ideas, and to generate a reasonable hypothesis for the puzzle of the variations among the tortoises that have been described.

Bruner suggests that different domains necessarily require distinctly different forms of inquiry and expression, "the imaginative application of the paradigmatic mode leads to good theory, tight analysis, logical proof, sound argument, and empirical discovery guided by reasoned hypothesis" (1986, p. 13). The imagination of the novelist or poet, however, requires a different mode of thought, a different way of understanding or expressing, and it takes the narrative form. It permits an understanding and a form for exploring and expressing those aspects of human existence and experience which, Bruner states, "the heartlessness of logic" (ibid, p. 13) is unable to

convey. Rugg (1963), Weisberg (1993), Koestler (1964) , Shepard (1988) and Perkins (1981) suggest, however, that although imaginative thinking is narrow in terms of focus, it is often broad in terms of the forms that its inquiry might take, and it is not limited in its forms of investigation. Indeed, the form and the language of creativity and discovery of new ideas, should not be confused with the language and form that the explication of ideas may take. The latter, as pointed out in Chapter Three is governed by the formal rules of verification and explanation within that domain, the former often more fluid, interactive, experimental, and unpredictable.

Imaginative thinkers tend to use a variety of non verbal forms of representation as well as more "rational" forms of inquiry in their consideration of what might be possible. Intuitive scientific thinking, for example, has often been described as involving elements of visual imagery, or other non verbal forms of thinking about a question. Weisberg (1993) suggests that using metaphor or analogy, incorporating unusual elements, considering analogous problems or parallel questions often provide a fresh insight or perspective. Perkins (1981) reports that artist often play with colour, angles, composition, and with the aesthetic challenges of a piece before and during composition of a creative work. These allow the individual to deviate from conventional approaches, and re-conceptualize an idea in new forms.

The next consideration the teacher must make, therefore, is what type of activities will enable students to approach the task in broad and varied ways, to use non verbal as well as verbal forms of inquiry, to view, conceptualize, and express ideas of what might be possible. Ideas might be explored or expressed in expository or in narrative forms, in artistic and graphic representations, video or audio productions, drama, music and movement. Guided imagery or visualization might also be used to consider an alternate view. Concrete representations in the form of models, schematic representations, or manipulative materials all present different ways of thinking about the questions, problems and challenges and "playing" with concepts. Students might use analogy, metaphor, they may look for contrast or parallels in other fields of domains to develop their ideas.

Although the teacher is directive and definitive in the formulation of the task, he or she should encourage flexibility, and divergence with respect to the ways both they and the students choose to explore ideas. An inquiry initiated by the Galapagos tortoises, for example, might involve students in tracing the story of Darwin's explorations through his journals. They may re-enact his observations, they may debate possible explanations for his observations. They might make a documentary videotape of the development and refinement of his ideas, and contrast that with journal entries that reflect his concerns about the apparent contradiction between his

ideas and authoritative accounts of creation. Students may use graphic or schematic representations to trace his travels and depict or describe his observations. They might participate in dramatic re-enactments of the debates with Fitzroy, or relate Darwin's travels through the journals of Fitzroy.

The meetings of Darwin with Maoris, and other peoples his journal describe might be related and interpreted through the eyes of the native peoples. Students may make comparisons with Mendel's later work or explore the factors that caused Alfred Wallace to develop a similar theory of evolution. They might compare mythological accounts of creation with Darwin's ideas and examine the basis for belief of each. They might convey the geological uniqueness of the Galapagos Islands in paint, poetry, or in a creative dance which depicts the islands' volcanic creation and the subsequent emergence of life. The final outcome of the whole inquiry might be for students to understand the significance of the journey of the *Beagle,* and to generate some possible hypotheses or explanations for the unusual and diverse animals on the Galapagos Islands - emergent or prototype[10] theories of evolution, heredity or biological classification. Students may develop some knowledge and understanding of Darwin as a major historical

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10. I use this term in the sense of "an initial conception", rather than as an archetype.

character, develop some knowledge of his role in the origin of modern biology, and understand the human dimension of the scientific enterprise.

As suggested in Chapter Three, an individual can imagine possible people, places, things, occurrences, explanations or reasons, outcomes, alternatives, uses, interpretations, events, expressions and so on. These imaginings might be richly detailed and include the fantastic, the bizarre, the impossible as well as the highly likely, but these ideas may not be of any real educational value. A student, for example, may imagine that tortoises have telescopic legs and the ability to transform their shells at will after they swim from island to island, but as Degenhardt and McKay have pointed out imagination can be "a means as well as an obstacle to knowledge and understanding" (1988, p. 240), and self indulgent fantasizing which is ill-informed or undisciplined has little real educational value. I claim that giving credence to ideas that are clearly ill-founded or inaccurate is miseducational. To be imaginative, as I have defined it, those ideas must be based on adequate knowledge, be coherent and reasonable, and refined into sound hypotheses, interpretations or conceptions.

As mentioned earlier the development and refinement of imaginative ideas is related to adequate and accurate knowledge, but as also mentioned in previous chapters, objective knowledge presented as irrefutable fact, may also discourage students from using their own intellect

to think of possible explanations, reasons and so on, for themselves, rather than relying on authoritative views. The teacher must, therefore, ensure that students have access to both the knowledge and skill to be able to apply criteria of reasonableness to both the generation of possibilities and to the progressive refinement of their ideas, while ensuring that the process of wondering is not closed down by a teacher's statement of "fixed factuality" (Bruner, 1986, p. 127). A student's tentative hypothesis about a species' adaptation to changing environments might be refined by the teacher providing further information about other species that have demonstrated adaptive changes over time, by asking students to find out about the disappearance of certain species, or by drawing their attention to facts that require the child to refine or reshape the hypothesis.

Finally, the teacher must establish the criteria he or she will use to assess the students' ideas. Lessons and units are generally concluded with an assessment that determines the extent to which outcomes have been achieved successfully. The term "evaluation" might be applied to an assessment of students' imaginative thinking, but the associations of this particular term with the means-end model of teaching suggest a certain singularity or conformity of outcomes that is not appropriate here. I propose that the term "demonstration" accommodates a greater range of possibilities, conceptions and forms of expression that children might produce within a

given lesson or unit, although clearly the outcomes will often fall within certain somewhat predictable parameters.

The teacher's assessment of a child's ideas in demonstrations of their imaginative thinking may not necessarily be based on the accuracy of the child's conceptions in any true objective sense, but, as suggested in Chapter Three, will be based on the reasonableness of the conceptions relative to the information available to the students and the student's capacity to utilize that information. The justification for the value of conceptions that may appear to be unsophisticated or naive is based on the belief that understandings of complex concepts are generally refined over time as students acquire more knowledge and intellectual skill. Restricting exposure of students to only those concepts they can master completely limits what might be presented to them, and trivializes their educational experience. Expectations that teachers may have for children at different levels throughout their education will, however, clearly differ. A kindergarten child's explanation of the growth of the seed that he has planted and cared for will differ from the hypothesis advanced by a grade 11 student about an approach to solving a particular algebraic problem in terms of sophistication and reasonableness, and with respect to its relationship to objective truth.

Assessment of imaginative thinking might best be seen as related to the degree to which the child has developed a new or different perspective,

an enhanced understanding or a reasonable hypothetical or a prototypical grasp of the topic or issue. The teacher will assess the degree to which the child has thought of possibility and refined those ideas into workable and reasonable conceptions. Where development of objective knowledge is also part of the teacher's aims for the lesson, this also needs to be assessed. For example, grade seven students might be expected to demonstrate a reasonably accurate understanding of the specifics of Darwin's journey and the significance of his observations, but demonstrate in their interpretations, their dramatic re-enactments, or their hypotheses, statements of reasonable and reasoned possibility, such as an emerging understanding of the relationship between the adaptive changes in a species and specific environments. Grade 11 students, however, might be expected to relate Darwin's ideas to theories of Malthus, Mendel, and Lamarck, to understand the principles of change, mutation, stasis and evolution, to relate principles of heredity to their own qualities and characteristics, or to begin to be able to understand and argue the possible moral and ethical issues related to the application of scientific theories of genetic engineering in society.

This idea that the teacher might direct a students' imaginative thinking so narrowly may contradict popular views that the imagination is autonomous, unconscious and unconfined, and that controlling or focusing the imagination is essentially incongruous. I suggest, however, that if

students are to generate imaginative perspectives, ingenious interpretations, or worthwhile hypotheses that teachers must provide some shape and structure to the tasks they design, and be clear about the focus for the students' thinking.

A planning structure

The preceding discussion suggests that lesson(s) designed to incorporate elements of imaginative thinking have a number of complex components. The teacher must motivate students and design tasks which involve them in resolving a question, challenge or problem imaginatively, that is, refining possibilities into worthwhile ideas. This requires planning which investigates the topic, considers the characteristics and capabilities of the students, and recognizes what complementary knowledge students may need to complete the task. The teacher must guide the student in their inquiries, provide feedback to encourage exploration and promote various ways of viewing or representing the ideas, and encourage the reasoned refinement of ideas. This requires the teacher to use judgment in providing information and direction where needed, using well considered questions, statements and direction. The teacher must plan the final form(s) the students' imaginative conceptions will take and generate appropriate criteria to assess the student's performance. This requires a clear sense of what

constitute reasonable expectations given the knowledge and capabilities of the student. Preparation for teaching involves the teacher in a consideration of all these elements.

"Most planning frameworks," notes Egan, "are derived from Tyler's "rationale" (1992, p. 91). These follow a fairly standard format beginning with a statement of objectives or anticipated outcomes of the lesson, the definition of material and activities that are intended to achieve the intended outcome, and concluding with a description of the ways in which the degree of success in achieving the outcomes can be evaluated. As Egan notes, Tyler's framework does nothing to either encourage nor preclude imaginative teaching (1992, p. 92). However, the very definitive nature of the predetermined outcomes prescribed in a planning model like that derived from Tyler's model, will inevitably narrow the possibilities that the lesson provides for students' imaginative thinking. I suggest, therefore, that elements of the lesson are couched in different terms, and that the planning structure takes the form of questions that deal with the way the elements of the unit or lesson are organized, and also shape the teacher's conceptions of the imaginative potential of the material or topic in the pre-lesson planning. These questions relate to four major areas: preparation, motivation and exploration, and demonstration.

- **preparation**
  - the teacher's assessment of student knowledge, capabilities and interests;
  - the teacher's understanding of the curriculum goals to be achieved;
  - the teacher's imaginative interpretation of the opportunities the topic offers for "thinking of possibility", and for students' imaginative explorations.
- **motivation and exploration**
  - the teacher's consideration of the ways in which the students' imaginations will be engaged - what will create interest, curiosity, wonder, anomaly and so on;
  - the task that will involve a consideration of possibilities as a critical stage;
  - the supporting or complementary knowledge students need to develop and refine ideas;
  - the forms that students' explorations might take
  - the criteria that inform the refinement of student ideas
- **demonstration**
  - the forms the students' conceptualizations will take;

- the criteria for assessment of both objective knowledge or understanding, and the imaginative investigations that the students have undertaken.

These elements form part of the overall planning for the unit or lesson, and can be incorporated into the following questions to guide the teacher's planning.

A PLANNING STRUCTURE

Preparation

- What knowledge or understanding of this topic will the students develop ?
- What elements of this topic will engage the interest of students at this age?
- What opportunities does this topic present to involve students in developing reasoned possibility or thinking imaginatively in interpreting, judging, hypothesizing, creating, inferring, empathizing, evaluating or projecting?

Motivation

- How can I create a desire for explanation, exploration or expression? How can I motivate, challenge students' beliefs, or evoke a sense of wonder or active curiosity?

Exploration

- What is the *possibility* that students will explore?
- What complementary knowledge do the students need to generate and refine possibilities, and how will this be provided or developed?
- How can I encourage varied exploration and expression, and refinement of students' ideas?

Demonstration

- How can the students demonstrate their ideas? What aspects of the students' work can and should be evaluated?

In proposing this planning model I am not implying that all lessons should focus solely on the production of imaginative conceptions. Imaginative thinking goes hand in hand with disciplined knowledge, and the way that the teacher weaves these elements together is, I believe, dependent on the topic, the learners, and the task. In its total sense, the teacher must exercise autonomous professional judgment in deciding when to present information that the students simply need to know, and when to require that students use that information in activities which will synthesize that information into new understandings or reasoned possibilities. There is clearly little point in students onerously and slowly re-discovering basic facts or re-inventing basic information, but the development of more conceptual understandings, those which require the individual's grasp of meaning, requires an active construction of understanding.

To pull these pieces into a more coherent whole, I will now provide a very brief overview of a series of lessons within a grade seven science unit. The topic is Darwin, his journey in the *Beagle*, his observations, and the foundations of theories of evolution and species adaptation. I have selected a topic from the sciences rather than the arts since the role of imagination in the arts in education is fairly well accepted, and this example from the field of science provides some further support for the claim that imagination may play a role in all subject areas in the school.

A GRADE 7 SCIENCE UNIT

CHARLES DARWIN AND THE JOURNEY OF THE *BEAGLE*

PREPARATION - the teacher's exploration of possibility

What knowledge will the students develop about the topic ?

In addition to introducing students to notions of systems of classification of living things, and adaptation of living organisms, this topic also develops a sense of science as "a human endeavor ... an attempt to search out, describe and explain patterns and events in our environment" (B.C. Elementary Curriculum Guide, Grades 1-7, 1994, p. 6).

Specifically the teacher might encourage students to:

- develop knowledge about the voyage of the *Beagle*, an understanding of Darwin as a major historical and scientific figure, his task, his observations, the importance of his ideas
- develop a beginning understanding of evolutionary change or mutation
- develop knowledge of the geological history of the Galapagos Islands and its population by various plant and animal life forms
- develop skills of inquiry including researching information in a variety of locations
- present ideas in a variety of expressive forms
- develop independent views, argue and support a point of view

What elements does this topic contain which will engage the interest of students?

- the exotic and fantastic nature of the Galapagos islands and animals - iguanas, tortoises,
- the extraordinary characteristics of the tortoises - size, habits, their uses to mariners
- the youth of Darwin, his passion for collecting, his voyage of discovery
- the mystery of the islands, the perplexing animals, the puzzling diversity
- the romantic associations of the islands with piracy, with adventure

What opportunities does this topic present to involve students in developing reasoned possibility or imaginative ideas - in interpreting, judging, hypothesizing, creating, inferring, empathizing, evaluating or projecting?

- interpreting the observations, detecting or inferring patterns of sameness and diversity,
- generating possible explanations for the origins of plant and animal life on the islands
- thinking of possible interpretations of Darwin's observations, re-enacting an exploration of his hypotheses, viewing Darwin's ideas from other positions
- evaluating possibilities and planning investigation to validate suggestions
- imaginative association with character, empathetic understanding of the scientific endeavor

A UNIT MIGHT THEN PROCEED AS FOLLOWS:

MOTIVATION

The unit might be begun with a film of the Galapagos Islands which focuses on the bizarre and extraordinary geography, the curious animals, the mystery of the variations among animals of the same species from island to island, and the history rich with stories of whaling, and of pirates and buccaneers replenishing their food stocks with the giant tortoises. Original journals could introduce Darwin, his passion for collecting, his sudden and unexpected assignment to the *Beagle*, the journey of discovery, and the puzzles and paradoxes he attempted to understand. Students will, hopefully, be curious about the islands, the arrival of the bizarre and varied creatures, what Darwin observed that was so interesting, what mystery he investigated, and what theories he developed to explain the paradoxes he discovered.

EXPLORATION

A. Having established that the Galapagos Islands are the tips of volcanoes which have risen from the ocean floor, and that the entire archipelago is made of lava, each island being forced up at different times and therefore weathered to different extents, the puzzle of when and how plants grew on volcanic rock and when and how animals got to an archipelago some 600 miles from the mainland of South America will be posed. *Possibility:* Students will be ask to think of possible ways in which plants and animals might have begun to live there, and groups of students could develop an idea about the origin and arrival of one species of plant, bird or animal, expand their hypothesis, develop a plan to investigate their hypothesis, and then refine the ideas and present them in some form for the other groups. *Refinement:* As part of their explorations students will investigate the species to assess its place within the animal kingdom, identify other locations where the animals are found, compare and contrast characteristics, and so on. They will consider the geographical location of the Galapagos Islands, the relationship of the islands to continents where like species are to be found. They will consider patterns of ocean currents and so on. The teacher will interact with students in such a way as to encourage broad and varied searches for relevant information in texts, films, computer data bases, and other experts sources, assist them in interpreting that information. *Demonstration:* They will present a reasonable hypothesis for how the particular plant or animal came to be living on the islands, and a justification for their hypothesis and their findings. This might be done in any appropriate form - media presentations, dramatic or artistic representation, oral, written or graphic information, models and so on. The students' demonstration at the culmination of the investigation will present not only the final hypothesis or proof, but also relate the process of selection and refinement of ideas.

B. The focus will now switch to Darwin's story. Through selections of journal entries supplemented by maps, pictures, illustrations, films and other visual aids, the journey of the

Beagle will be followed. *Possibility:* Students will be asked to step into the role of a sailor on the ship, or a member of one of the indigenous native groups Darwin encountered and describe and explain Darwin's behaviour. "Just what is this man doing? Why is he doing this?" They might then step into the role of Darwin to relate his journey, to explain his collection of specimens, his drawings and his observations, and his ideas about the Galapagos mysteries. From these accounts students might be involved in a discussion about the nature of science as a field of human inquiry, and derive some understanding about the role of observation, of hypothesis, of verification in establishing scientific theories. Students will then be asked to take Darwin's observations and make an objective, analytical guess about what conclusions, guesses or hypotheses might be made of the observations, and re-enact his speculation about the variations among the tortoises on the islands. *Refinement:* The teacher, or other students, may take contrary but provocative positions to encourage students to pose possible theories, to argue and to support their views by referring to their observations, to knowledge about the species to which the Galapagos tortoises may be related, to knowledge of the topography of the islands, and so on. *Demonstration:* Bringing this information together, the students will generate a theory to explain the distinct evolutionary patterns of the tortoises and present the theory with pictures, artifacts and so on.

DEMONSTRATION

The activities will produce a number of varied forms of student work, including charts, narratives, graphic depictions, artistic representations, role playing and so on. The teacher would assess the accuracy of the objective knowledge, the reasonableness of the hypotheses, interpretations, inferences drawn from the information students had located, and the validity of the ideas relative to the other disciplines that may have been involved - art, drama and so on. Specifically this would include:

A. Students' hypotheses about the origins of animal and plant life on the islands

- their search for information to refine and support their hypothesis,
- their development of possible explanations of animal and plant life in the Galapagos.

B. Students' understandings of the process of exploration and discovery

- an understanding of Darwin's story and the nature of scientific observation
- their understanding of the changes and mutations which Darwin observed.

Conditions supporting imaginative thinking

With respect to the organizational and pragmatic issues of developing imaginative thinking in the classroom, I do not propose to deal with these questions in any great detail, partly because the creation of a "supportive environment" alone does not ensure that imaginative thinking will take place, and also because I believe that an appropriate environment is largely self-evident. The preceding definition of imaginative thinking, and the description of the form that it might take, suggests certain characteristics of the physical, social, and psychological setting, the nature of the interactions between the teacher and the students, and the exploratory, lively environment of the classroom. The teacher, for example, clearly needs to consider the organization of the physical setting for the types of inquiry and/or interactions that the activity requires - space for display of students' displays of Darwin's voyage and observations, a setting for the dramatic re-enactment of the presentation of Darwin's work to the Linnean Society. The

teacher also needs to ensure that the resources necessary to promote and support the students' inquiries are available and that they are varied - books, pictures and films of the Galapagos Islands, tortoises in aquaria, presentations by biologists about how animals are classified, cameras for students' film presentations, computer terminals for access to expert sources and data bases, and so on. Students' imagination will likely not thrive in a sterile environment, but will be stimulated by variety and by vivacity. An appropriate social and psychological environment also needs to be established, one which recognizes individual student traits and characteristics, and which encourages independent, well founded imaginative thought, rather than encouraging an uncritical reliance on authoritative views.

Simonton has observed that there is "little reason to doubt that formal education can inculcate a certain conformity of thought, even rigidity that can hamper innovation" (1987, p. 69). If students have been socialized to accept, learn and reproduce conventional ideas, and if teachers are habituated to adopting the role of expert in the process of transmitting conventional knowledge to their students, introducing imaginative thinking successfully into such classrooms may be somewhat problematic, particularly at the more senior levels. I will not enter into a discussion at this time about the larger issues of the philosophical and ideological

questions that affect choices of curriculum content and the selection or definition of curriculum goals, rather I will deal briefly with a few points relating to the relationship between the teacher and the students.

Bruner, who advocated "the solo child mastering the world by representing it to himself" (1986, p. 127) now characterizes the processes of children's discovery and invention as a more collaborative negotiation, a communal event, with the teacher as partner in the child's explorations (ibid, p. 127). The customary expectation of the "teacher as expert" still holds true with respect to the planning of activities that will engage students imaginatively with a topic, and the "orchestration" of lessons, but the teacher's role is not simply one of transmitting conventional views. It is also one of encouraging students in their individual and independent intellectual inquiries. This is not simply a case of being a "facilitator" merely supporting students' random exploration of any or all ideas that might interest them, but of consciously crafting the tasks and the interactions to enable students to develop worthwhile, coherent and intelligent conceptions. This may take the form of assisting students to locate information that might provide a new perspective, redirecting their thinking by crafted questioning or postulating of possibilities, and encouraging them to be critical of their ideas and to want to test and refine their conceptions. This requires that the teacher explicitly designs lessons

which incorporate those tasks, that the teacher gives credence to students' ideas, and that the teacher's interactions with students invite and support the wonder, surprise and curiosity that promote imaginative thinking.

Bruner notes that teachers' use of language in the classroom does not generally invite inquiry, create wonder, or generate a sense of possibility. Teachers often present a "far more settled, far less hypothetical, far less negotiatory world", and establish a far more authoritative and inflexible stance inside the classroom than outside the classroom (Bruner, 1986, p. 126). A teacher can "close down the process of wondering by flat declarations of fixed factuality", states Bruner (1986, p. 127), by, for example, simply explaining the conventional view of variations among the Galapagos tortoises. The language of the classroom, Bruner suggests, cannot be the "uncontaminated language of fact and objectivity" (ibid, p. 129) if we truly wish students to engage in discovery and invention.

The teacher, suggests Bruner (1986), promotes inquiry by not only structuring tasks that permit student exploration, but also by deliberately using language which genuinely invites and supports the exploration of possibility through expressions that contain words expressing uncertainty. For example: "How *might* the Galapagos Islands have been formed? How *could* animals have been brought to the islands by ships, by birds, by logs? Tortoises look rather like turtles, how might tortoises *possibly* be related in

some way to the turtles we find in local ponds? I am *puzzled by* the fact that the animals on the islands were so unafraid of man. I *wonder* what a tortoise living in a densely forested area might look like. I am really *surprised* at the different sizes and shapes of the tortoises on the islands." Statements such as these, suggests Bruner, present a far less categorical view of the world, they suggest a multiplicity of possibilities rather than a single view, and they encourage students to consider what might be possible. Language which encourages imaginative responses differs from the language of direction or explanation, both in terms of the response it elicits and the stance it suggests. The motivational force and intent of the language a teacher chooses is just as critical as the tasks the teacher designs to challenge the students' idea. Although subtle, there is a difference between statements such as, "I want you to imagine how life arrived on the Galapagos Islands", and, "I wonder how life could possibly have begun in such a barren and desolate place". One implies that the fictitious invention of any and all ideas would be quite valid, the other denotes a more focused and rigorous role for imagination in developing sound and reasoned explanations.

Bruner's caution about the nature and possible restricting influence of the language of fact and objectivity raises the further question of non literal uses of language in the classroom, and it would be remiss to leave the topic of language and imagination without some reference to the role of tropes,

poetic or figurative uses of language, and particularly the role of metaphor, in the consideration of possibility. Max Black (1991) suggests that metaphors act as "cognitive instruments", and that something new is created when a metaphor is understood. He also suggests that metaphor enables us to perceive things in different ways. He states that literal sources of language are often, "insufficient to express our sense of the rich correspondences, interrelations, and analogies of domains conventionally separated; ... metaphorical thought and utterance sometimes embody insight expressible in no other fashion" (1991, p. 34).

Hugh Petrie notes that in education it is generally believed that, "the main home of metaphor is in poetic insight and any more general cognitive function is ideally better served by explicit analytic language" (1991, p. 439). Petrie, however, argues that cognition is the result of mental construction, and that metaphor often plays a "crucial epistemic role of rendering radically new knowledge intelligible" (1991, p.441). He states,

> "literal language requires only assimilation to existing frameworks of understanding ... accommodation of anomaly requires changes in the framework of understanding. It is this general requirement of change in cognitive framework that provides the distinction between the ways interactive metaphor and literal language are to be understood
>
> 1991. p. 445

Certainly there is some evidence, particularly from the field of science (Kuhn, 1991, Boyd, 1991) to suggest that metaphor may be a significant

cognitive strategy in the development of new ideas and new paradigms. It may indeed play a useful role in enabling students to think of, and understand things differently, or related to other elements in novel ways. As Sticht (1991) has pointed out, however, successful understanding of the full ramifications of a metaphor requires knowledge of the domains expressed, and supposes some fairly sophisticated metacognitive or analytical skills, which younger children, in particular, may not yet have developed. Sticht does suggest, however, that metaphor has educational value in its ability to create the cognitive anomaly which Scheffler (1991) has suggested may initiate the wonder or surprise related to an imaginative consideration of what might be possible.

The use of metaphor may provide one way for the teacher to create cognitive anomaly or puzzlement in the students, it might enable two domains of knowledge to be brought together in a novel and interactive fashion, and it could provide the means for a topic, a question or an issue to be considered or expressed in a new way. In those senses, the use of metaphor to both break the literal-mindedness and empirical biases that many students may have acquired (Green, 1991), and to stimulate novel ways of viewing a question or a topic are valid and useful in education. Although Green disagrees with Petrie that metaphor is necessary for the development of new understandings, he states that, "metaphor might be

useful sometimes in that essential step of learning called 'exercising imagination,' or entertaining the counterfactual, or 'getting' the premise needed to escape the paradox" (1991, p. 472).

One further, but less critical point that I want to make, largely because it is rather unfashionable in a climate where group process, cooperative learning and "active" learning are so valued, relates to the place of talk, discussion, quiet and contemplation in the classroom. Dunkin and Biddle (1974) suggest that classroom interactions are generally dominated by the teacher, and that students are usually given very little opportunity, and very little time, to respond to even the most demanding questions. Students' ideas are, as a result, hasty and often superficial. Thinking well simply takes time, and may also require periods of uninterrupted quiet. Egan suggests, "it is in the silent recollection and contemplation of what has been learned that the imagination goes most effectively to work" (1992, p. 159). In fact, accounts of imaginative thinkers suggest that periods of almost contemplative calm are desirable for the production of worthwhile ideas. Although Rugg and Shepard support the notion that creative insight is often preceded by almost meditative or trance-like states, Weisberg suggests that there is little empirical evidence to support such a phenomenon, and certainly nothing to suggest that such a contemplative period is necessary in the generation of new ideas. However, there may be some validity in the

view that quiet concentration is necessary for "good ideas" to be formed, whether they are imaginative or otherwise. Teachers should provide students with sufficient time and opportunity to move beyond the level of superficiality, to a careful and thoughtful consideration of possibility, as well as to provide opportunity for the necessary dynamic interplay between teacher and students, and among the students themselves that is often related to the development of new ideas and new perspectives.

In this chapter I have made reference to the fact that the teacher must take account of the nature and characteristics of the learners in planning units or lessons to incorporate elements of imaginative thinking. This includes understanding what elements of a topic will interest or motivate students at that age, what tasks are within their cognitive or imaginative capabilities, and what complementary knowledge is necessary for students to be able to generate and refine worthwhile possibilities. Egan has suggested that elements that might engage the intellectual interest of students will differ throughout their educational development both in form and in degree. A typical 13 year old student, for example, may be intrigued by, and focus on the romantic, heroic, or fantastic elements in the account of Darwin and the origins of modern theories of evolution and may derive somewhat different understandings from the inquiry, than a typical 17 year old student, although this topic forms part of the curriculum in both grade seven and grade 11.

Similarly, the tasks that are set must be consistent with the imaginative capabilities and interests of the students.

I will now consider the application of the planning structure I have suggested in relation to what has been discussed about the intellectual and imaginative characteristics of the 15-18 year old learner. Recognizing that each topic will present particular opportunities for teachers to involve students in thinking imaginatively, and that generalized principles are vague at best, I will nonetheless draw some general conclusions about the specific considerations a teacher might make in planning to involve students in producing reasoned and valid conceptions in the senior years of high school. The two questions I will address are related to initiating curiosity or engaging the students' imagination, and moving them from a passive or literal mode into an imaginative relationship with the topic. The other relates to the types of learning activities involving a consideration of possibility that are likely to be most appropriate for students at this age. In the Planning Structure proposed on page 174, these questions are related to the Motivation and Exploration elements of the lesson(s).

Planning for imaginative thinking - the 15-18 year old student

Earlier in this chapter I suggested that the teacher might begin lessons or units by creating surprise or curiosity in the students by introducing

elements of mystery, uncertainty, paradox, cognitive dissonance, or discrepancy, or by promoting a genuine desire in the students to adopt a different perspective, or to see things from a different point of view. In Chapter Four, I argued that 15-18 year old students are increasingly able to understand complex and abstract concepts, to separate themselves from their own experiences to think of possibilities other than those they have previously encountered, to consider various alternatives, and to argue the logical consequences of feasible alternatives. This suggests that, like their younger counterparts, they may be motivated by puzzle, mystery, dissimilarity, curiosity, and uncertainty, but that they may also respond to more complex intellectual challenges to their suppositions, beliefs and intellectual capacities, such as those introduced by elements of paradox, contradiction, enigma, discrepancy, or controversy. The previous discussion, however, also indicated that adolescents apply their intellectual interest somewhat selectively to those topics that are of particular interest to them, and that, in order to motivate their intellectual and imaginative interest, this too needs to be considered in the teacher's planning.

15-18 year old students are characterized by their increasing interest in understanding philosophical or theoretical frameworks, and placing specific details or information within those organizing schemes. They are also characterized by an egocentric interest in understanding themselves and their

relationship to the world, and by a focus on understanding the meaning and the significance of information they encounter. Students at this age appear to have a particular interest in, and disposition towards thinking of possibility in relation to themselves, their lives and their possible futures. Therefore, students' imaginative interest might be engaged by the human (and personal) interest, significance or relevance of the topic, by its theoretical or philosophical aspects, and by its explanatory elements.

Rather than simply relating new concepts to those which preceded them or to students' existing knowledge in that discipline, the teacher might look for the human significance of new material, or consider how he or she might reconstitute a human context for the topic, or establish an explanatory or sympathetic connection between the material and the students. In history, this may take the form of developing an understanding of historical events derived from a beginning focus on characters, motives, values, and human aspirations. In literature, the teacher might also identify those aspects of the work that present recognizable human dilemmas, conflicts in points of view, or experiences that are relevant to a student's own search for values, explanations and understandings. The human aspects of science may be found in the stories of exploration and discovery, in the practical utilization of scientific knowledge, in the ethical and moral questions that relate to the application of scientific findings, and in the successes and the fallibility of

human attempts to explain and control the natural world. A student's interest in, and understanding of art, poetry, music, drama, and dance might develop, not simply from the acquisition of knowledge of forms or techniques, but by an empathetic understanding and appreciation of the desires, beliefs, feelings and experiences of the authors and artists, and the human significance of the tales they tell. The human fascination with the patterns, the puzzles, the development of a symbolic language to order mathematical knowledge, and the everyday applications of mathematical knowledge to solve problems may be used to intrigue or interest students, or to provide some human context for what is often presented as a highly abstract subject.

Student's interest in wholistic understanding, rather than fragmented information suggests that teachers might also consider how the material might be approached from, what Egan has referred to as, the "philosophic perspective" (1978, p. 66). The teacher might plan to relate new material to its larger theoretical or philosophical framework in a dialectical relationship which Egan describes as similar to Piaget's notion of "schemata assimilating and accommodating to new experiences and knowledge" (ibid, p. 75). Approaching a new topic, the teacher might look for the "greater whole" of which new material forms a part. Historical events, for example, might be related to theories of the rise and decline of civilizations, or to studies of

changing ideologies, to revolution and change, to trade, or to economic development. Scientific facts and understandings might be placed within the scheme of natural laws, or within the larger historical or social context. Literature, poetry, art and drama might be related to the archetypal forms of human experiences, or the cultural or historical context.

The teacher might also identify the explanatory elements of a topic. Explanatory, both in the sense of explaining the relevance of new curriculum material to theoretical or philosophical frameworks, and explanatory in the sense of establishing a link between a topic and those questions, dilemmas, choices that are very much a part of the young person's personal and intellectual interest. As mentioned in Chapter Four, the adolescent is prone to embracing ideologies or taking idealistic or categorical stands on issues, particularly those of a social, political or moral nature. A teacher might explore the potential that a topic might have to offer in terms of explanation, exploration or reasoned discussion on those topics which the students feel particularly passionate about or particularly interested in. Students' concerns about environmental issues, may for example, provide points of engagement with subjects such as chemistry, biology, economics, geography and history. The adolescent's profound sense of injustice and hypocrisy, their indignation about exploitation or misuse of power, might relate with topics in literature,

in history, in art or theatre, and their romantic idealism might be connected with art, poetry, history and philosophy.

As proposed in the Planning Structure, the first step in planning involves the teacher identifying the elements of the topic which have the potential for developing curiosity and imaginative interest, in the case of 15-18 year old learners, those of human significance, philosophic interest or explanatory value, and looking for puzzle, enigma, controversy, paradox, and so on to generate curiosity and provide an entree into activities which will involve students in thinking imaginatively about the topic. In the topics of evolutionary change, species adaptation, mutation and change, for example, that form part of the biology curriculum in the senior years as well as part of the science curriculum in grade seven, elements of human interest or relevance may include theories of genetics or acquired characteristics that explain student's individual features in terms of familial and genetic traits. The evolutionary history of the human species may provide an understanding of the individual's place in the greater biological scheme. The young Darwin's dilemma in developing ideas which contravened authoritative views and pitted science against the church might relate to students' experiences of challenging authority.

Philosophic or theoretical elements that might engage students' curiosity or interests might include understanding the major radiations

which link or relate species, or which trace evolutionary paths, the systems of biological classification, the bases for faith in authoritative views. Elements that might appeal to ideological interests might also be found in moral or ethical questions concerning applications of knowledge of genetics for selective breeding, and the potential for human genetic engineering. The concept of race, and of diversity and convergence might engage the curiosity of students who are becoming increasingly perceptive and insightful of others, and who are also attempting to define their own personal identity.

A motivational impetus or "educative occasion" might be created by posing questions or statements such as: What if parents had children, or animals had young, whose characteristics were entirely random. What might happen? Does this, in fact, occur to some extent? Why/not? What if people could "dial in" their characteristics for any given day. What characteristics might they select? Why? What might happen? In what ways would this be positive/negative? Darwin suggested that a species survives because of adaptation and survival of the fittest. Might being lucky, smart or sensible also be a factor? What characteristics would ensure the survival of our species? Should we "engineer' our survival as a species by selective breeding? What fundamental values does selective breeding or genetic engineering violate?

Explain the purpose of mating rituals in animals. Are there any similarities between such rituals in the animal kingdom and our behaviour? Explain dating in terms of the selection of mates and partners. What behaviours do we associate with this? How might social values or beliefs have changed the "natural" form of selection? Should parents select your mate? Are courtship and marriage customs in our culture based on the species' survival?

Darwin, Galileo and other thinkers have generated theories that challenge authoritative or commonly held views. Can you explain why two opposing views can be believable, that the sun revolves around the earth and that the earth moves around the sun, for example? What are other possible explanations for the variations among the turtles that Darwin observed? What might be a plausible mythical or a scientific fiction explanation? How do we decide which is correct? Is there absolute certainty? If someone were to promote the view that the human species was not related to the ape family, but had developed from spores carried on a meteor, how would that change our history, our religions, our biology? How would you be able to decide which version was true? Might some factions want to control this information? Why?

The answer to the question, "What opportunities does this topic present for students to interpret, judge, create, infer, empathize, project or to

consider reasoned possibility?" is clearly one which can be answered only within the context of a particular topic. As indicated in Chapter Four, however, 15-18 year old students appear to have a propensity to think of possibility, and they are developing the critical reasoning capabilities to refine those ideas. They are also capable of more subtle and perceptive insights than younger children, they are more able to appreciate others' experiences and points of view, and they are more proficient in handling complex and abstract issues. This, coupled with their interest in the philosophic, human, or explanatory elements of topics suggests that the types of activities requiring active consideration of possibilities that students of 15-18 are likely to be most enthusiastic about include those which enable them to examine, present or debate issues from varying human perspectives, to consider and juxtapose the moral or ethical and the practical aspects of a question, to consider the impact or implications of new information.

Although the intellectual capabilities of 15-18 year old students are most frequently described in terms of their ability to hypothesize, to plan and project, they are also likely capable of intelligent interpretations of social or historical events, of perceptive insights into moral, ethical or philosophical questions, of sensitive and intuitive understanding of literary and artistic works, of imaginative expressions of their beliefs, feelings and understandings. While the imaginations of younger children might be easily

captured by accounts of heroic people, amazing events, exotic things in the natural world, and their imaginative conceptions might take the form of dramatic re-enactments, plans, pictures, models, projects, tangible products or active productions, the imaginative interest and activity of older students is largely focused on the world of ideas. Their imaginative conceptions are possibly more likely to take more complex, abstract or symbolic forms, and their conceptions may be expressed in more varied and diverse forms of representation.

It could be argued that, during the last years of formal schooling, students are well placed to develop knowledgeable, refined, coherent and comprehensible conceptions expressing new and workable ideas, to think imaginatively as I defined it in Chapter Three. It might also be suggested that many of their ideas may indeed be unusual or creative in a more objective sense. Students at this stage of their education have an increased capacity to work independently, they have greater knowledge, they are very familiar with, and are often able to utilize, a variety of resources and media, particular the modern computer and video technologies that are often more a feature of their lives than of their teachers', and they are able to relate information from a variety of fields (Ausubel, 1977). They can, therefore, explore ideas with greater skill and facility than children who are younger. The particular nature of adolescent thinking, however, suggests that, in order for them to

refine ideas - interpretations, expressions, hypotheses, evaluations, critiques and so on, students need access to sufficient knowledge and to carefully structured and critical processes for revising and perfecting or improving ideas. The balanced or dialectical relationship between possibility and refinement, between imagination and knowledge seems to be particularly important if students' ideas are to be worthwhile and effective, and not be prey to the tendency of students of this age to storm impetuously to the centre of things, as Hall so aptly described, without the mediation of sound reasoned consideration.

Teaching students in adolescence is generally believed to be very challenging, both personally and intellectually. Egan has suggested that teachers at the Philosophic Stage require a "Christ-like sympathy and sensitivity to those being taught" (1978, p. 81). To this I would add the need for an imaginative understanding of the mind and the life of the adolescent, an imaginative capacity to see how the central concepts of a topic might possibly be linked with the students' particular intellectual and imaginative characteristics, and a skill in engaging students' capacity for imaginative thinking. This needs to be linked to sound knowledge of disciplines, and to a commitment to maintaining the integrity of the subject. It also needs to be coupled with a fundamental belief in the power of the human intellect, and trust in the intelligence and intellectual independence of young people.

This, however, is generally true of teaching at most levels, and in Chapter Six, I will consider what this implies for the preparation of new teachers with respect to questions and issues raised by the Planning Structure that I have proposed, and by the claims implicit in the definition of imaginative thinking.

Chapter 6

DISCUSSION AND IMPLICATIONS

> What has happened to imagination? It has been discouraged by liberalism, by complacency, by technical rationality, by obsessions with predictable results. But I believe that the work we do in our classrooms ... still may remain open-ended in our encounter with continuing newcomers. It can still become an affair of beginnings, of thinking about what is not - and what eventually might be
>
> Greene, 1988, p. 55

I have argued that imagination has an important and justifiable role to play in the education of young people, by claiming that imaginative thinking plays a significant part, not exclusively in inventive, creative, artistic or expressive acts, but also in activities such as interpreting, hypothesizing, inferring, creating, designing, projecting, judging, evaluating, empathizing, and understanding other points of view. I have also taken the basic position that imaginative thinking is not judged simply by objective criteria for "imaginativeness" or creativity, but that it plays a role in the development of new conceptions and different understandings, in that it leads the individual away from what they currently know or think to be so, in the direction of what else might be possible. I have claimed that thinking imaginatively is

intellectually rigorous, and that it is fundamental to most intelligent thought. In agreement with Barrow, Greene, Bruner, and others, I claim that the ability to look beyond what seems to be so, and to consider what might be, is a quality of an educated, rather than an indoctrinated, or a simply well trained individual. The capacity to think imaginatively is one to be valued, and also one which can, and should, be consciously and deliberately fostered in schools.

Implicit and explicitly stated in this thesis is the assumption that there are some fundamental differences between thinking which is imaginative, in that it may consider multiple and varied possibilities, and thinking which is analytical, deductive, or based on explicitly logical associations between concepts which lead to singular outcomes, or to somewhat narrow conclusions. While these modes of thinking are not mutually exclusive or dichotomous, they are qualitatively different both in terms of activity and outcome, and each needs to be developed in particular and somewhat different ways. Rugg (1963) has suggested that the ability to think imaginatively has been accorded far less significance and credence in education than the ability to think in a hyperanalytical way (ibid, p. 310). This, however, is not simply a reflection of the particular knowledge and attitudes of teachers and the nature of their own education and professional preparation, but, as Eisner and Greene have suggested, it is an attitude and an

intellectual orientation which is endemic in our culture, in its values, and in its institutions.

There are obviously a number of political, ideological and philosophical influences on current educational practice, and I acknowledge the fact that significant changes in understandings about the role of imagination in education, or indeed in thinking generally, must take place at political and ideological levels as well as in schools, classrooms and teacher education programs. My comments from this point, however, will focus largely on the practical issues raised by the preceding discussion, and on the implications of the thesis I have advanced, for the preparation of beginning teachers. I will focus specifically on three issues, the nature of student teachers' knowledge of learners, their understanding of the subjects they will teach, and their understanding of the nature of the enterprise of education in general and of teaching in particular.

The approach to teaching that I have proposed in the previous chapter assumes that teachers have a comprehensive understanding of the students they are teaching. By comprehensive, I mean that teachers understand the "whole person", to use a rather hackneyed expression. While studies of the physical, social, emotional and intellectual development of children already form part of the preparation of most beginning teachers, the extent to which these studies reflect a complete range of intellectual capabilities of students is

questionable. Rugg makes the claim that, "we have millions of hours devoted to training in solving problems by reasoning, but almost none devoted to cultivation of the imagination" (1963, p. 310). There seems to be little doubt, judging from the general dearth of descriptions of children's imaginative lives, and the almost total absence of discussion about the role of imagination in thinking in textbooks used in teacher education programs, or in the general vocabulary of teaching or educational theory itself, that this is indeed the case.

Greene, Rugg, and Eisner attribute the lack of significance placed on imagination in education largely to the dominance of technical rationality in Western culture. The lack of faith in imagination as a significant and worthwhile intellectual force might be traced historically from the Platonic suspicion of imaginary illusion, through the decline in confidence in the humanistic imagination, to the rise of empiricism, and the ascent of the trust in the ability of "scientific' methodology and deductive reasoning to discover and explain all naturally occurring phenomena. Imagination is described less in terms of a real, but inexplicable, power of the human spirit, and more in terms of neurological, physiological and psychological processes. Although authors such as Perkins and Weisberg attempt to establish that extraordinarily creative thought is nothing more than highly efficient and effective use of ordinary thinking processes, others, such as Scheffler and Rugg, contend that,

while there may be some identifiable factors associated with the ability to create, there is no mechanical or technical explanation for the working of the imagination. There is currently no clear or satisfactory physiological or psychological account of imagination, the capacity to imagine, or the generation of imaginative or original ideas, yet education derives most of its learning and teaching theory from studies in the fields of neurology, biology. and psychology.

As the historical account of conceptions of imagination shows, imagination and the capacity to imagine are not easy to define or describe, and the lack of a satisfactory conception of imagination to guide educational theory and practice is, in itself, less troubling than its virtually total exclusion from any discussions of human cognition. As I suggested in Chapter Four, however, many intellectual activities which involve imagining - thinking of possibilities, are frequently subsumed under, or incorporated into terms which are taken to mean, or imply, deductive processes or analytical functions. The terms "hypothetical thinking" and "formal operational thought", for example, are both terms commonly and almost exclusively used to describe mature thought, and they imply particular forms of scientific deductive reasoning derived from the Piagetian model of cognitive development and defined by the nature of his experimental methodology. These associations of mature thought with analytical and deductive thinking

further the view that mature, intelligent, and rational thought is rather singular in form, and does not necessarily involve imagination in any significant way.

My claim that most independent and intelligent thought involves elements of imagining, however, suggests that there is a need to re-conceptualize or recast our understanding of what constitutes cognition in far broader terms, to redefine the nature of cognitive development, and to clarify and elucidate the nature of the intellectual activities children will undertake in schools, and the capacities they will develop. Not only do the concepts of imagination, imaginative capabilities, imaginative interests and imaginative thinking have to be part of the student teacher's vocabulary and inform their understanding of the minds of the students, but certain assumptions about thinking that currently prevail need to be reviewed and displaced or re conceptualized in terms that reflect the fundamental differences among various intellectual activities, and between those activities which simply require logical deduction and those which require imaginative thinking. Such re-conceptualization should be multi-disciplinary. It requires both the conceptual clarity of philosophical or conceptual analysis, and the practical or empirical support of psychological and educational study.

A comprehensive account of the intellectual capacities of children should, therefore, include a full and complete description of their intellectual

capabilities and development in terms which reflect imaginative as well as analytic and deductive capabilities. It should also include accounts of what children choose to think about, and what they consider to be significant or important. As the review of 15-18 year old students suggests, learners are not simply characterized by intellectual proficiencies, but by changing motives and interests. Philosophical or clinical accounts of cognition or cognitive capabilities need to be balanced with knowledge of how children think about "real" things, and what they themselves choose to think about or regard as interesting or consequential. Teaching activities should be planned, not simply with children's cognitive capabilities in mind, but also cognizant of the ways in which students interpret information, and the elements of topics which engage their imaginative curiosity. The preparation of student teachers should, therefore, include comprehensive and extensive studies of children, including all the aspects that constitute their "thinking" life. It should also develop an accurate understanding of the terms used to describe students' thinking, and a clear understanding of the nature, the value, and the limitations, of the various theories of cognition on which theories of learning and teaching practices are based.

Throughout this discussion the relationship between imagination and knowledge has been discussed with respect to the important role that it plays in the students' generation of possibilities, however, it also plays a significant

and central role in the teacher's planning. The Planning Structure that I have proposed implies that the teacher needs to understand the subject matter, not simply with respect to the content as they themselves may have learned or understand it, but from the perspective of the imaginative interests of the students, and with an understanding of the potential that it offers for students to think of possibilities in ways that are educationally worthwhile. These might be described as the disciplined, motivational or pedagogical aspects of a subject. In *Those Who Understand: Knowledge Growth in Teaching* (1986), Lee Shulman makes a distinction between the ways teachers might understand a topic, and the ways in which they understand how best the topic might be taught to students. My position is somewhat similar, in that I contend that knowledge of the structure of the subject alone is likely not sufficient for teachers to teach imaginatively. Neither is coursework designed to develop understandings of generic principles or methods within a particular domain likely to enable student teachers to understand how a particular topic might engage students' imaginations or what possibilities it offers for imaginative thinking. Teachers clearly need knowledge of topics and the forms of inquiry and standards of validity of the subject or discipline to be able to structure activities and to guide the students' inquiries in ways that ensure the validity and integrity of their ideas. They also need an understanding of what elements are likely to engage the imaginative interests

of students, and they need knowledge of the ways in which classroom activities might be structured and organized. Put simply, student teachers need to know the subjects they are to teach well. They need to understand its disciplined nature and its motivational elements, and they need to understand and master appropriate pedagogical strategies.

The issue of the significance of thorough knowledge of subjects is, of course, a perennial topic of debate in discussions about the education of teachers. Many elementary teachers appear to be woefully lacking in sound and in-depth knowledge of subjects they are to teach; their professional preparation is rather dominated by courses in teaching methodology, and their own education has prepared them with only a superficial understanding of subject matter. Concerns about the preparation of secondary teachers have generally been related more to the dominance of disciplined subject matter knowledge, and the lack of adequate understanding of the students they are to teach, or a dearth of knowledge about a range of suitable methods. The degree to which this is a true and accurate reflection of current teacher education programs is not at issue here, rather the more important issue relates to the fact that teacher education programs need to ensure that beginning teachers have adequate and appropriate knowledge of the subjects that they are to teach, and that they are capable of using that knowledge to plan imaginative

lessons. Teacher education programs should obviously seek to develop both elements in concert.

The role that I have defined for teachers implies that both knowledge of the subject and curriculum goals and a perceptive understanding of students, must be ingeniously combined by the teacher into novel and imaginative lessons. This assumes that student teachers must have a particular aptitude for thinking independently and imaginatively. A natural corollary of my thesis, of course, is that the capacity to teach imaginatively might be encouraged and developed by approaching their education and professional preparation in much the same way that imaginative thinking might be encouraged in the classroom. The student teacher's professional preparation might focus on developing the knowledge and aptitudes necessary to plan and teach imaginatively, rather than on encouraging them to simply adopt conventional or technical approaches to planning and teaching. The capacity to think of what might be possible is certainly necessary if they are to be able to deviate from the conventional and prevailing norms of current classroom planning and practice, and depend more on their own professional judgment than on pre-packaged or mass produced curriculum materials.

I obviously cannot make the claim that even the most uninspired or unimaginative students can become imaginative teachers. However,

recruiting and admitting students to education programs on the basis of some demonstrated imaginative capability, and ensuring that the ability to plan imaginative lessons is a requirement for certification would likely ensure that the program would be more successful in preparing independent and imaginative teachers. It might also prevent, "students who show not an iota of imagination and who seem guaranteed to bore generations of students mindless but who prove competent users of the approved management skills" from passing into the teaching profession (Egan, 1992, p. 154).

The final point, which far from being the last consideration, is rather the fundamental basis for student teachers' understanding of what the teacher's role might be, relates to their understanding of the nature of the educational enterprise itself, and the way that teaching practices reflect educational goals. There is often a vast gap between the rhetoric of educational philosophy and the realities of classroom practice. This is particularly evident in student teachers' impatience with courses in educational foundations and their belief that such studies are totally irrelevant, and provide little to assist them in classrooms.

There must, however, be some philosophical grounding for teaching practice. Educational goals of producing independent, imaginative and critical citizens must be explicitly and carefully translated into principles which guide everyday practices in classrooms, and everyday practice must be

assessed relative to broader educational goals. There are obvious contradictions, for example, between teaching that habitually demands compliance and conformity, and the educational ideal of a free, imaginative intellect. If they are to teach in ways that encourages development of imagination, students teachers need to have very clear understandings of the imaginative nature of man, of thought, of forms of knowledge, of educational ideals, and of language, and these understandings need to be woven into the fabric of their understanding of education, and reflected in their role as teachers. These philosophical underpinnings must be related to, and incorporated into students teachers' preparation, planning and teaching in tangible and recognizable ways, and reflected in the role they adopt in the classroom, and in their relationship with students.

It might be argued that the elements that I have discussed, knowledge of learners, knowledge of subject, knowledge of the theoretical and philosophical foundations of education and teaching, are essentially little different from what currently exists in teacher education programs. I believe, however, that the points I raise are more than subtle variations on an existing theme. I have placed significantly higher value on the amount and forms of students teachers' knowledge of the subjects they are to teach. I have suggested that underlying conceptions of cognition need to be redefined and broadened to include a more accurate account of the richness and variety of

human thought. I have suggested that student teachers are educated to be autonomous designers of curriculum rather than prepared to be simply technically proficient, and that their underlying philosophical conceptions of thought, knowledge, education and teaching are predicated on a far broader view of the human intellect, one which recognizes imagination as central to intelligent thought. I have suggested that they are educated to work in cooperative and collaborative roles with students in developing their knowledge and intellectual acuities, not trained to simply be disseminators of authoritative views. I suggest that they must be educated, intelligent and imaginative.

I also suggest that, rather than developing the various elements of their preparation as discrete and separate components, as is typically the case in teacher education programs, these elements might be combined in somewhat more imaginative and integrated ways. The teacher's planning always begins with the question of <u>what</u> topic is to be taught. <u>How</u> it is to be taught will then be determined by what is to be learned both in terms of disciplined knowledge and the intellectual skills and dispositions that are to encouraged, and by the characteristics of students. As such, planning decisions are heavily contextualized unlike classroom management and other organizational aspects of classroom activities which may be rather generic in nature and applicable to a variety of classroom settings and

subjects. The elements of topics which will engage the imaginations of students, and the opportunities for activities which might engage them in thinking of reasoned possibility will also likely differ somewhat from one subject to another. Thinking imaginatively in science, for example, may well differ from thinking imaginatively in language arts or history, and there will also be some variations among topics with a particular domain, although there may clearly also be some similarities.

Principles to guide a student teacher's planning decisions, therefore, should be drawn largely from the domain specific nature of imaginative thinking rather than based on any generic principles. I suggest that elements of underlying philosophy, of child development, and of teaching methodology should be integrated into, or directly related to studies of particular subjects.[11] Rather than isolating the elements that play a critical role in student teachers' planning decisions in discrete and separated courses, and developing knowledge of the subject, knowledge of the intellectual and imaginative characteristics of learners, studies of philosophy, and so on, as independent and individual fields of study, I suggest that these elements need to be explicitly linked in the context of subject matter or specific topics as they

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11. This does not, incidentally, imply that independent studies of elements of educational theory or practice are not valid or worthwhile. Within the context of the education of beginning teachers, where a synthesis of elements is critical to their ability to plan successful lessons, however, isolating elements involved in planning from each other is somewhat problematic.

inform the student teacher's planning decisions. The ways that various knowledge informs lessons should be explicitly modeled for students, paradigmatic or prototypical examples should be developed for student teachers, and clear guidelines for the types of imaginative engagements and teaching activities that support imaginative thinking could be established for the student teacher's own lessons. Pedagogical knowledge, therefore, becomes highly contextualized. Philosophical notions of thought, knowledge and education become embedded in the content and the shape of lessons, and knowledge of children's minds is reflected in the activities the teacher plans for them to undertake.

In proposing this form of preparation for student teachers, I am claiming that teaching in ways that encourages imaginative thinking is first and foremost an intellectual endeavor, and only secondarily a practical and organizational enterprise. The intellectual aspect of teaching should, therefore, be the primary focus of teacher education programs, the technical aspects of teaching discussed in the context of <u>what</u> is to be taught. While certain elements that influence school classrooms, such as mandated curriculum content, required forms of assessment and so on are largely beyond the control of individual teachers and of teacher education programs, the way in which the teacher conceives of, and organizes the content is not. It is here that clear conceptions of imagination and imaginative thinking can be

translated into effective lessons. It is in the everyday planning of lessons to excite and engage students' minds that the teacher's imagination can take flight.

Conclusion

I have claimed that imaginative thinking is informed, rigorous, disciplined and focused, and that imaginative conceptions are not simply subjective interpretations or relativistic notions, but that they are related to objective criteria for validity, coherence and reasonableness. I have also claimed that activities such as pretending, visualizing, playing, and supposing, and other classroom activities that are often assumed to engage the imagination or promote imaginative development, do not necessary involve imagination. In defining imaginative thinking as the generation of refined, disciplined and reasoned possibility, and in giving form to an approach to teaching that might foster this type of thinking in students, I have, of course, presented only one possibility from the many that might be imagined. The thesis proposes one way of viewing imagination, and one approach to planning and teaching that might create the conditions for student's imaginations to be, in a sense, liberated. The structure that I propose does not imply that imagination does not also work in other ways, or that the working of the imagination can, indeed, be explained simply in terms

of elements or conditions. Nor does it suggest that encouraging imaginative thinking can be achieved by merely leading students through a series of pre-planned and pre-ordered steps. This is clearly not the case. I acknowledge the marvelous and often inexplicable ways in which the imagination often works, ways that have been a source of wonder and superstition since earliest times. I recognize that students cannot be taught to be imaginative, and that the very best that teachers can likely do is to kindle and fan the imaginative spark in a student's mind.

The Planning Structure that is proposed, however, attempts to address the limitations of current teaching practices. First, it attempts to free the concept of imaginative thinking from the negative associations of much imaginative activity with triviality, liberalism and relativism. Secondly it addresses the fact that much current teaching presents information as absolute and inviable, and teachers typically focus largely on the students' acquisition of conventional ideas. This, however, often precludes the need for students to use their imaginative capacities to think for themselves, or to consider what may be the possible reasons, meanings or significance of information and experiences they encounter in school. Such an omission, I believe, is lamentable for a variety of reasons, not the least of which is the fact that a significant element of students' intellectual capabilities, the capacity to imagine, is not being recognized, exercised or developed. Yet this is the very

capability which has produced humanity's most significant ideas, works of artistic and creative expression, architectural and engineering achievements, and humanistic understanding. It is, indeed, the capacity to think of possibility which has created the most noble of humanity's accomplishments, and it is imagination which ensures intellectual and personal independence. To achieve the educational ideals of an independent and critical intelligence, teachers of 15-18 year old students, those young people poised on the threshold of adulthood, should be actively developing and refining students' capabilities and dispositions to be imaginative - to think of reasoned possibility.

This, however, requires that adolescents need to be viewed as less problematic and difficult than is currently the case, that the highly imaginative, individualistic intellects of students are recognized, and that lessons and units reflect a sensitivity to all the factors and elements that influence the way young people think, and what sparks their interest. In *Theory and Problems of Adolescent Development*, David Ausubel comments that, "although motivation is a highly significant factor in and greatly facilitates learning, it is by no means an indispensable condition" (1977, p. 447). He further states that,

> "frequently, the best way of teaching an unmotivated student is to ignore his motivational state for the time being and focus on teaching him as effectively as possible. Some degree of learning will ensue in any case, despite the lack of motivation: and from

> the initial satisfaction of learning he will, hopefully, develop the motivation to learn more"
>
> ibid, p. 448

I suggest that Ausubel's optimism is woefully and dangerously misplaced. School dropout rates are appallingly high, and the passivity and apathy of many senior school students stands in direct contrast to the vivacity and intellectual agility that they demonstrate in their lives outside the classroom, and by which they seem to be more properly characterized. The fact that teachers can ignore the adolescent's motivational state is alarming in its avoidance of the real issue, that, as Goodlad (1984) pointed out in *A Place Called School,* schools are often bland, drab and lacking in novelty, humour or excitement. In the words of students, "schools must come alive" (Montgomery Students' Alliance, 1973, p. 57). They must become places where the intellects and the imaginative capabilities of young people can be engaged and liberated.

This thesis leaves several issues for further consideration. The many terms used to describe thinking need to be re-assessed in the light of the claim that it is imagination that enables the individual to think of possibility, and that reasoned possibility is a central element of most intelligent "higher order" thinking. The nature and purpose of education need to be reviewed in light of the fact that current practices in schools appear to encourage an unimaginative and unquestioning acceptance of conventional views in students which is inconsistent with many of the alleged ideals of

independence and critical thought. The nature of teaching needs to be redefined in terms that recognize the critical and central role of the teacher in developing all the students' intellectual capabilities, and the importance of knowledge of topics, knowledge of learners and knowledge of language in the teacher's planning and teaching. The nature and organization of teacher education programs need to be re-assessed relative to the claim that the role of the teacher is primarily intellectual and only secondarily organizational, and that teaching imaginatively requires an imaginative integration of knowledge of subjects, students, and forms of inquiry within domains. These should include a range of resources and technologies to complement the more limited and traditional methods of communication and representation of ideas. Finally, the qualities that are required to teach imaginatively must be established, and criteria for admission to teacher education programs must be re-assessed relative to the claim that a teacher needs to be intelligent, intellectually agile and imaginative.

The intellectual and organizational challenges of defining and implementing such changes may appear rather daunting, but they can, of course, be overcome with a little imagination! The young, states Maxine Greene, "call to us ... to break through the fixities of our age. They call us to imagine - to look at things as though they truly could be otherwise" (1988, p. 55).

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