CHAPTER - II

THEORETICAL VIEWS OF CREATIVITY

Necessitated by the 'theme' of the present investigation, efforts have been made to present a synoptic view of the theoretical considerations of creativity in this chapter. It was thought that such an attempt would be of immense help in gaining greater insight into the problem as also in providing a 'sound base' for the study.

CREATIVITY: Meaning and Definition

A major source of confusion in the creativity studies lies in the lack of conceptual clarity and disagreement among the researchers as to the meaning and nature of creativity. Hallman (1963) makes a mention of two reasons, namely, (1) the tendency to emphasize separate interests by a wide variety of disciplines to investigate the creative process, and (2) the complex nature of creative experience, which seem to be mainly responsible for the disorganized state of research evidence. The tendency to assign different meanings to the term creativity by different workers in the field has been reported by Vinacke (1952), Ghiselin (1963), Zimmerman (1964), and Yamamoto (1964c). The complexity of the creative experience is manifested by the numerous definitions, which Rhodes (1961) attempts to condense into four roughly discriminating strands, namely, (a) person, (b) process, (c) press, and (d) product as embodiment of ideas.
Likewise, the variety of definitions led Torrance (1965) to classify them in terms of (a) newness as criterion, (b) creativity versus conformity, (c) creativity as a process, (d) creativity through the approaches of mental abilities, (e) levels of creativity, and (f) approaches through studies of creative persons.

While summarizing research evidence, Hallman (1963) came across tentatively five major components of creativity definitions: (a) it is a whole act, a unitary instance of behaviour; (b) it terminates in the production of objects or forms of living which are distinctive; (c) it evolves out of certain mental processes; (d) it covaries with specific personality transformations; and (e) it occurs within a particular kind of environment. He abbreviated these components as the act, the object, the process, the person, and the environment. Basing his discussion on Rhodes (1961) classification of definitions of creativity, Mueller (1965) observes that: (a) creativity through the approaches of person may be considered in terms of physiology, temperament, personal attitudes, habits and values of person who creates; (b) explaining it by way of mental processes involves motivation, perception, learning, thinking and communicating the way the act of creativity calls into play; (c) press implies understanding of creativity by focussing attention on environment and cultural influences; and
(d) products of creativity include elements such as theories, inventions, paintings, carvings, poems and the like.

Despite the broadly discriminating strands of definitions, it is not likely to include a particular definition within a specific strand mainly on account of overlapping from one category of definitions to the other. Moreover, creative process without having reference to person, press and product is equally ambiguous. Torrance (1965), while accepting the process definition of creativity has rightly raised the questions: what kind of person one must be in order to engage most successfully in the process, what kind of environment one needs in order to function most successfully in the process, and what kind of product results from the process?

In an attempt to arrive at a meaningful picture of numerous definitions of creativity, different views have been tentatively accommodated within the roughly discriminating categories of (a) product, (b) process, (c) person, and (d) press, in association with their respective emphasis on newness as criterion, bioclastic and Freudian approaches, unitary versus multicriteria coupled with mental abilities versus personality slant, and psychological safety and psychological freedom, as follows:
(a) Creativity as a Product

Creative products essentially include an element of newness which implies novelty, freshness and inventiveness. It is a quality of originality involving fusion of perception in a new way, finding new connections and relationships, production of new insights, moulding of experience into new organizations, presentation of new constellations of meanings, and innovations.

In some definitions of creativity, newness has been viewed as tangible products but certain others hold that it can also be present in the intangible products. Through another approach, newness is manifested by the acceptance of creative products in the context of society or the individual.

Rogers (1962) and Arnold (1962) include a poem, a work of art, or a scientific theory under tangible products. Mednick (1962) asserts that such creative results must be useful. Likewise, Haefele (1962) pleads that the creative innovations must have a social worth.

The usability aspect of creative products has been stressed by Stein (1933) in his definition of creativity, which otherwise is basically a process definition. According to him, creativity represents a regeneration of existing materials or knowledge as a consequence of interaction between a creative individual and his environment for the production
of something new that is acceptable as tenable or useful or satisfying by a group at some point in time. Harmon (1956) agrees with the contention that creativity pertains to new form or arrangement of old elements involving production of something new but at the same time the creative product must contribute to the solution of a problem. In agreement with Harmon's problem solving strategy, Mackinnon (1962b) holds that creative response or idea is either novel or at the very least statistically infrequent which, in reality, serves to solve the problem or fits in a situation or accomplishes some recognizable goal involving sustaining of the original insight and evaluation and elaboration of it, a developing of it to the full. Simon (1964) considers that the product of thinking should have novelty and value for other thinkers or society requiring modification or rejection of previously accepted ideas, high motivation and persistence and dealing with or solving a problem which initially was vague and undefined.

Accepting the product definition of creativity, Rogers (1954) is of the view that creativity involves an emergence in action of novel, relational product and further argues that such a product grows out of uniqueness of individual on the one hand and the material, event or circumstances of his life on the other. Piers et al. (1960)
attach importance to novelty and usability of creative products, outcome of which depends upon the capacity of an individual to avoid usual routine and unconventional ways of thinking and of doing things. To Mallory (1970), creativity implies not making things however complex, which already exist, but making new forms.

Opposed to Mallory's remark, Stewart (1950) insists that creative thinking may occur even though the idea produced may have been produced by someone else at an earlier time. To him, productive thinking may take place in the mind of humblest workman as well as in the most distinguished statesman, artist, or scientist. He mainly upholds the importance of creative product to the individual and not to the society. In the similar vein, Thurstone (1952) argues that it does not make any difference whether society regards an idea artistic, mechanical or theoretical, as novel. An act of creation necessarily implies some novelty for the creator. Too much emphasis on the tangible nature and social value of creative products is not appreciated by Guilford (1964) on the plea that idea of usefulness involves a value judgement in a way that science cannot tolerate or manage. A novel idea culminating out of creative thinking may or may not emerge in the form of tangible products and many a useless invention is invention nonetheless. He further argues that the kinds of mental activity that go into inventions, useful or useless, are
essentially alike psychologically. Likewise, Parnes (1960) considers creative behaviour as discriminative, relational and evaluative and maintains that the product may be unique and valuable to a group or organization, to society as a whole, or merely to the individual himself.

The definitions thus far dealing with the tangible and novel creative products emphasize social worth, appropriateness, desirability and recognizability. On the other hand, intangible products may or may not have relevance to society but they certainly have psychological relevance to the individual creator with regard to recognition, utilitarian value, meaningfulness and appropriateness.

(b) Creativity as a Process

Numerous references occur in the research literature which are in support of the viewpoint that creativity is mainly a process. Creative thinking has been regarded basically as a process of seeing or creating relationships. It comprises the processes of discrimination from many alternative possibilities and that of synthesizing elements in altogether new and original ways. Simpson (1922), for example, defines creativity as the initiative which one manifests by his power to break away from the usual sequence of thought into an altogether different pattern of thought. The change of pattern of thought from the initial to the final stage involves varying shifting approaches to a problem and
selection of different elements so as to bind them together in tenable systems. Likewise, Bartlett (1955) emphasizes the need to deviate from main tract, to break out of the mould, to be open to experience, and to permit onething lead to another, as characteristics of 'adventurous thinking' — a term synonymously taken for 'creative thinking'. In this process, Jennings (1963) perceives movement from loosened to tightened construction. By loosened construction he means the varying shifting approaches to a problem, testing of hypotheses, and manipulating elements in a situation which lead to arrive at the tightened construction accounting for the solution of a problem in a given situation.

Ohlslin (1958) regards creativity as a process of change of development or evolution in the organization of subjective life. The process is characterized by human purposes rather than either the random processes of nature or trial and error processes of human activity. Torrance (1962) describes creativity as taking place in the process of sensing difficulties, problems, gaps in information, missing elements; testing these guesses and possibly revising and retesting them; and finally in communicating the results. He claims that his definition describes a natural process, and that strong human needs reappear to be the basis of each of its stages. In this way, he
maintains that his definition places creativity in the realm of daily living and does not reserve it for ethereal and rarely achieved heights of creation. Creativity as a mental process, thus, seems to be purposeful and goal directed (Harmon, 1956; McKinnon, 1962).

Stressing upon the bisociational approaches in the creative process, Koestler (1964) attempts to integrate the findings of a range of disciplines into a single theory of creativity, seeks to synthesize his own theory of creativity as manifested in humour, art, and science with the latest conclusion of psychology, physiology, neurology, genetics, and a number of other sciences on the thesis that all creativity processes share a common pattern termed as 'bisociation' which is the connecting of previous unrelated levels of experience and frame of reference. According to him, the creative act of connecting previously unrelated dimensions of experience enables the creator to attain a higher level of mental evolution. It is an act of liberation — the defeat of habit by originality.

From considerations of "combinatory play" and "associative play" concerning ideas and images (Einstein, in Ghiselin, 1952); a confused 'Mass of Thought' tumbling over one another in the dark (Dryden, in Ghiselin, 1952); and occasions upon which ideas flow best and most abundantly (Mozart, in Ghiselin, 1952); Nadnick (1962) defines
creative thinking as "... the forming of associative elements into new combinations which either meet specified requirements or are in some way useful." His definition implies that the person's associational behaviour poses a general orientation towards some given requirement that guide the nature of his responses. The same general associative conception of creativity has been followed by Wallach and Kogan (1965) with slight variation in their operationalization. They conceive of this process in terms of the number of associational responses and uniqueness of these responses, thus operationally making it possible to measure creativity.

To Freud, (1949) creativity originates in a conflict within the unconscious mind (the id). Sooner or later, the unconscious produces a solution to this conflict. If the solution is ego-syntonic, if it reinforces an activity intended by the ego or conscious part of the personality, it will issue in creative behaviour. In case, it is at odds with the ego, either it will be repressed altogether or it will emerge as neurosis. Besides the role played by unconscious mind in creative thinking, Hebb (1949) considers that the conscious mind also contributes to it and maintains that creative function is a function of relative strength of conscious and unconscious processes. Neo-Freudians are at variance with Freud in accepting creativity as the product of pre-conscious rather than the unconscious mind. They believe that creative thinking
occurs when the ego voluntarily and temporarily withdraws from some area of the preconscious in order to control it more efficiently later. Thus creativity is a regression permitted by the ego in its own interest. The uniqueness of creativity, that is, its capacity to find and put together something new, according to Kubie (1958), depends on the extent to which preconscious functions can operate between two ubiquitous concurrent and oppressive prison wardens, namely, unconscious and conscious processes. In a review on Freudian and Neo-Freudian conception of creativity Rugg (quoted by Kneller, 1965) comments that it is more likely that imagination and creativity, though specially strong in the preconscious, are present, in some degree, at all levels of mental activity.

(c) Creativity through the Approach of Person

Another strand of definitions of creativity (personological approach) has relevance to cognitive qualities and non-cognitive aspects of personality. The conception of creativity in terms of cognitive power has frequently been thought of as a single dimension or at least as a unified cluster of traits resembling and to some extent overlapping general intellectual ability, whereas within the context of non-cognitive aspects of personality, a set of characteristics is considered to
Various authors argue that creativity is related to unique cognitive factors. Guilford (1950, 1956, 1957 & 1959a), for example, considers creativity as involving the interplay of all factors of divergent thinking on the one hand, and factors of seeing problems and evaluation on the other. His point of view reflects that creativity, whatever its range of application, is by no means a unitary trait but is rather a collection of different component abilities and other traits. In support of his argument, he lists a number of factors of creativity, such as Word Fluency, Ideational Fluency, Semantic Spontaneous Flexibility, Figural Spontaneous Flexibility, Associational Fluency, Expressional Fluency, Symbolic Adaptive Flexibility, Originality, and Elaboration. Initially, he limited the mental abilities involved in creativity to those grouped under divergent thinking but at a later stage, he added three more factors, namely, Symbolic and Semantic Redefinition, both belonging to convergent thinking, and Sensitivity to Problem belonging to Evaluation. On the basis of Guilford's factorial studies, Lévy and Havighurst (1961) observe that creativity includes seven factors, namely, Sensitivity to Problem, Associational Fluency, Ideational Fluency, Spontaneous Flexibility, Adaptive
Flexibility, Originality and Redefinition. Out of these, factors of Fluency, Flexibility and Originality are common with Good's (1959) description which also includes one additional factor of Ability to make Logical Evaluation. Good defines creativity as a quality thought to be composed of a broad continuum upon which all members of the population may be placed in different degrees. Torrance (1967b) also names Sensitivity to Problem, Ideational Fluency, Flexibility, Originality, Elaboration and Redefinition as factors of creativity.

However, definitions imply variations as to the degree of complexity of processes covered by creativity. Hence, although Gordon (1961), and Koestler (1964) have taken creativity as a unitary trait; McGuire et al. (1961), Sultan (1962), and Lehois (1963) think of defining creativity as a complex human attribute involving different factors; Ghiselin (1959) argues the existence of verbal factor of creativity and speculates that an analogous non-verbal factor may exist; Anderson (1964) obtains two factors of verbal and non-verbal creativity; and Taylor (1964) suggests that there are at least two types of creativity.

The non-cognitive qualities of a person that contribute to creative production, mainly stressed by Barron (1955), Getzels and Jackson (1962), Mackinon (1962a),
Torrance (1963a), Taylor and Holland (1964), and Wallach and Kogan (1965) have been presented in greater details under the caption 'creativity and personality' in Chapter III.

The rationale for studying creative behaviour in terms of personality seems to be provided by Rogers' (1954) definition according to which, "creativity is the tendency to express and activate all the capacities of the organism to the extent that such activation enhances the organism or the self." Creativity, he submits, has certain inner conditions, such as, openness to experience implying flexibility, the internal locus of evaluation considering other viewpoints of one's work not fundamentally allowing to alter it, and toying with elements and concepts drawing their implications in the intellectual exploration. Rogers, thus, appears to emphasize man's tendency to actualize himself, to become his potentialities as the main spring of creativity. In his view, creativity is characterized by traits such as intuition, and spontaneity with a tendency to self-realization. Maslow (1959) designates these two senses of creativity 'a special talent creativeness' (intuition and spontaneity), and 'self-actualizing creativity (self-realization). In the first sense, he says that creativity can occur despite neurosis but in the second sense, it is the expression of sound and integrated personality, the latter springs directly from personality.
In conclusion, agreement seems to fall in line with Dallas and Daier (1970) who maintain that creativity is not entirely a cognitive process, nor is it entirely a result of complex set of personality traits. On the other hand, creativity may be considered as related to unique cognitive factors (Guilford, 1950; and Lowenfeld, 1958), as also dependent upon certain personality characteristics (Frend, 1910; Barron, 1955; Couch and Munston, 1960; McGuire et al., 1961; Brevedahl and Cattell, 1968; and Copley, 1965). It is likely, therefore, that multiple types of creative talent exist and these intellectual components are linked significantly to certain personality (non-intellectual) characteristics as well.

(d) Creativity through the Approach of Press

Attempts to define creativity through the approaches of product, process and person are likely to be inadequate without reference to the 'press'. The term creative potential perhaps may best be actualized within favourable environments whereas indifferent and hostile conditions may inhibit it. Environmental conditions conducive to creative behaviour may be referred to psychological safety and psychological freedom, socio-cultural influences, and increased creativity through education.

Basic to the assumption of creativity in terms of environment, according to Hallman (1963), is the
condition of openness. It designates, "the characteristics of the environment, both the inner and the outer, the personal and the social, which facilitate the creative person's moving from the actual state of affairs which he is in at a given time towards solution which are only possible and as yet undetermined." These conditions include sensitivity, tolerance for ambiguity, self-acceptance, and spontaneity which are not aspects of man's inheritance. They are learnt and are, therefore, environmental factors. Openness to experience was earlier accepted as the criterion of environment by Rogers (1954), by which he meant "lack of rigidity and permeability of boundaries in concepts, beliefs, perceptions and hypotheses." It implies tolerance for ambiguity where ambiguity exists as also the ability to receive much conflicting information without forcing closure upon the situation which in the terminology of general semanticists is called 'the existential orientation'.

In the light of the remarks made by Hallman and Rogers, it may be suggested that the inner conditions of creativity cannot be forced but must be permitted to emerge. It raises very fundamental question as to how best the external conditions can be established in order to foster and nourish the internal conditions of creativity.

To this question, Rogers submits an answer whereby he argues in favour of setting up conditions of psychological safety and psychological freedom so as to maximize the
likelihood of an emergence of constructive creativity. Psychological safety may be established by three associational processes, namely, (a) accepting the individual as of unconditional worth, (b) providing a climate in which external evaluation is absent, and (c) understanding empathically. The condition of psychological freedom amounts to permitting the individual a complete freedom of symbolic expression — complete freedom to think, to feel, to be whatever is most inward within himself. It fosters the openness and playfulness and spontaneous juggling of percepts, concepts and meanings leading to creative behaviour.

Torrance (1965) also subscribes to the need for psychological freedom though expressed differently. In order to facilitate creative thinking, especially at young age, he recommends that creative thinkers be provided with a refuge; should get patronage by persons of prestige in the social subsystems; help the creative individual understand his divergence and the good reason for it; let him communicate his ideas by listening to him and by helping him to get listened to by others; make efforts to get his creative talent recognized and rewarded; and help parents, supervisors, and authorities to understand him. The creative individual needs to learn to accept inevitable limitations in the environment while yet holding to his purposes and searching for opportunities for the expression of his talent. He also needs to learn how to cope with
hardships and failures, with anxieties and fears, and to avoid isolation and retreat by way of adequate interaction with the environment.

Within the periphery of socio-cultural influences, such considerations as social institutions and practices, socio-economic status, and cultural subgroups including the disadvantaged, may be clustered together. Many social institutions and practices have been singled out as contributors to an unfriendly environment for creative behaviour. Mead (1989), for example, insists that our present ways of rearing children prepare them for team work but not to do the original work which makes a team worthwhile. Another practice is higher education and its admission and evaluation procedures. Getzels (1960) levels a charge against the conventional admission and evaluation procedures for being biased in favour of the convergent intellectual ability and social interest, what he feels, may be detrimental to the cause of adequate creative growth. Torrance and his associates (quoted by Barron, 1965) show that the creative thinking abilities do not only contribute to academic achievement in a way that has not been popularly associated but that poor disapproval by school is just as potent a factor as teachers' devaluation in driving divergent thinking underground. Likewise, Mednick (1961)
maintains that many of "our eminent creative people would
never have been admitted to college if selection techniques
had reached the current state of technology at the time
they had applied for admission." He further expresses that,
"by evolving a race of grade getters we have bred some
extremely desirable characteristics out of college population."

Convinced by the inadequacies of the admission
procedures, NMSC (Holland and Hunt, 1960) modified the
organisational policy by introducing the new system of
scholarships to (a) students with the highly creative promise,
and (b) students who are truly outstanding in some field
but less outstanding in others.

Another way in which the environment has failed
to reward creative behaviour has been in assuming that
creativeness is the sole prerogative of certain professionals,
artists, musicians, scientists, and the like. As against
this assumption, Maslow (1962) identified certain persons
as creative who did not belong to the category of professionals.

Studies by Rivlin (1959), Muss (1962) and Hudson
(1966) reveal that high creatives generally come from
higher socio-economic class groups. Wylie (1963) attributes
differences in creative behaviour to sex, race and socio-
economic status. Although Wallach and Kogan (1965) obtain
similar results yet they themselves doubt the validity
of their findings on the ground that their sample almost
entirely represented upper social-class group. Contrary to the above mentioned findings, Foster (1971) reports that he could find no evidence of creative ability as measured by variety of tests and ratings being significantly related to the social class of the parents of the children in the sample.

Creativity is not a product of the artist or the scientist alone, but it is relative to a particular culture as well. Cultural environments may favour or inhibit the creative production (Cattell, 1966). Very often social and educational factors within a specific culture, accounting for the institutional climate explain why certain universities or institutions produce more creative research than others.

Cultural deprivations seem to dampen the creative potential of individuals to which evidence has been presented by Reisman (1962). As a corollary of it, dampening effect accrues out of a feeling of psychological insecurity. However, Torrance (1967 & 1970), Covington (1969), Richmond (1968), Check (1970), and Langgulung (1971) do not find significant differences, on Torrance Tests of Creative Thinking, between the culturally advantaged and the disadvantaged barring minor exceptions.

Besides, understanding creativity by focussing attention to the press implies identification of a number of facilitating forces which might counteract some of the
inhibiting forces. Most of the studies that have been undertaken in this direction concern classroom setting and educational locale. On the basis of several studies, Torrance (1965) lists certain factors which facilitate creative behaviour. These are: ways of rewarding creative behaviour, creative motivation or attitudes of the teacher, creative activities and opportunities for practising skills in creative thinking, differential rewards for boys and girls, differential rewards for originality, competition, unconventional practices, creative rather than the critical peer-evaluated practices, peer pressures in homogeneous groups, trouble-shooting evaluation and helping children and young people value their own ideas. Attention is also given to differences in the ways different cultures encourage characteristics associated with the creative personality. Covington and Crutchfield (1965) attack the problem of training creativity by constructing a special curriculum in creative problem solving using an auto-instructional programme. In an experiment by them, the special training resulted in an increase in creativity. Training effects explain increase in the originality of responses in some earlier experiments as well (Parnes, 1959; and Maltzaman et al., 1960).
Gallagher (1964) reports that there are numerous indications that only slight changes in style and approach on the part of the teacher can modify the child's output in terms of originality and uniqueness on tests. Evidence to the effect of teacher's role has been presented by Gallagher and Archmer (1968) that the number of questions requiring divergent thinking asked by the teacher in a social study class of gifted children determines the proportion of divergent thinking expressed by the students. Spaulding (1963) arrives at the relationship between students feelings and performances and the affective or emotional atmosphere developed by the teacher as measured by time-sampling observations of the teacher in the classroom, and maintains that the teacher is an important figure in the development of both cognitive processes and personality characteristics in children. Demos and Gowan (1967) regard instructor's role in furthering the students' creativity as protective and nurturing one. Briefly, it appears to consist of five phases: (a) inspiration, (b) stimulation, (c) amelioration, (d) direction, and (e) encouragement and development.

A reference to 'brain-storming' (Osborn, 1957) and Synectics (Gordon, 1961) has been made as appropriate methods for increasing creative efficiency.
Creative potential, thus, seeks its maximal actualization within environmental conditions characterized by psychological safety and psychological freedom, socio-cultural influences, and increased creativity through education. However, research evidence does not present a clear-cut and consistent view about the differences in creative behaviour in relation to socio-cultural influences.

LEVELS AND TYPES OF CREATIVITY

Some of the apparent differences evinced by the foregoing discussions concerning various strands of definitions of creativity have been seemingly reconciled by suggesting that creativity may be thought of in terms of levels and types. This reconciliation, perhaps, is rooted in the assumption that creative thinking operates at different levels in different persons. Ghiselin (1956), for example, distinguishes between two levels of creativity, namely, (a) creative action of higher sort which alters the "universe of meaning by introducing into some new elements of meanings or some new order of significance", and (b) creative action of lower sort which gives "...further development to an established body of meaning through initiating some advance into use". Marksberry (1963) believes that "there are continuous gradations of creativity extending from the spontaneous drawings of children to high level type illustrated in the production
of such creations as space satellite." Likewise, Taylor (1989) suggests five levels of creativity:
(a) expressive creativity accounting for independent expression where skills, originality, and the quality of the product are unimportant, as in the spontaneous drawings of children; (b) productive creativity dealing with artistic or scientific products where there is a tendency to restrict and control free play and develop techniques for producing finished products; (c) inventive creativity related to inventors, explorers, and discoverers where ingenuity is displayed with materials, methods and techniques; (d) innovative creativity concerning improvement through modification involving conceptualizing skills; and (e) emergentive creativity, which is an entirely new principle or assumption. Taylor points out that many people have this fifth level in mind when they talk about creativity. Since this level of creativity is so rare, the lower levels have usually been involved in most of the investigations concerning creative behaviour. Lebois (1963) differentiates between macrocosmic and microcosmic creativity. In the former, man is simply growing and developing as a human being while in the latter, he is engaged in a particular act of creation such as painting. He further classifies creativity in terms of intensity at three levels, namely, (a) spontaneous — expressive
level — the initial level of creativity; (b) the technical-inventive level or intermediate level; and (c) integrative-emergentive level resulting into highly original products (widely applicable and useful).

A cluster of evidence moving away from the above mentioned notion emphasizes that creative activity involves an interchange of energy among vertical layers of psychological systems. Creativeness consists in a shift of psychic levels. Mainly two psychological levels referring variously to the primary and secondary processes, the autistic and the reality adjusted, unconscious mechanisms and conscious deliberations, free and bound energies, and gestalt-free and articulating tendencies have been identified (Freud, 1949; Schneider, 1950; and Ehrenzweig, 1958). Maslow (1959) also speaks of three levels: the physical, mental, and super-ordinate culture creations.

Yet another set of data regards creativeness as types of thinking. There seems to be a general agreement that creative thought consists of certain integrating, synthesizing functions; that it deals with relational form rather than with individual instances; that it discovers new forms which can accommodate past experiences. Spearman (1931) refers to creative thinking as eduction of correlates; Vinaiske (1952), as imagination rather than voluntary and rational operations; Mckellar (1957), as
autistic, prelogical and imaginative; and Bartlett (1956), as divergent autistic thinking as distinguished from closed systems.

From the point of view of creative activity, DeHann and Havighurst (1961) make a mention of three types, namely, (a) affective creativity in which emotions, senses and feelings of persons act as media; (b) functional or problem solving creativity involving situations related to the solution of mechanical and social problems; and (c) abstract creativity concerning concepts, definitions, abstractions and generalizations.

MacKinnon (1960) suggests the possibility of coming across at least two types of creativity. In the first type, the product of the creation is clearly an expression of the inner state such as the needs, perceptions, evaluations of the creator. In this type of creativity, the creator externalizes something of himself into the public field. Most appropriate examples of this kind would be found in the work of the expressionistic painter or sculptor, the poet, the novelist, the playwright, and the composer. In the second type of creativity, the creative product is unrelated to the creator as a person, who in his creative work acts largely as a mediator between externally defined needs and goals. Examples of this kind of creativity would be found in the work of the
research scientist in industry, the engineer, the mechanical inventor. A third type of creativity, one so wishes to call it, may be revealed in the works of the representational painters, scenario-writers, musical arrangers and performers and perhaps, most clearly of all, architects having characteristics of both type I and type II creativity.

Guilford (1956) opines that divergent thinking can be classified as figural, symbolic, semantic and behavioural depending upon the type of content involved. Based upon the extension of production, he further classifies divergent thinking into six types, namely, (a) units, (b) classes, (c) relations, (d) systems, (e) transformations, and (f) implications.

The creative process thus, seems to acquire both vertical and horizontal dimensions. The former has a relevance with the levels of creativity, while the latter refers to the types of creativity.

STAGES OF CREATIVITY

To identify general aspects of creative thinking, it is essential to distinguish it from a stream of intermingled thought processes involved in other psychological events. Impetus to the conception that creative thinking typically passes through a series of chronological
stages came from introspective reports by Helmholtz (1896) and Poincaré (1913). Helmholtz specifies a period of initial investigation of the problem until further progress is impossible, then a possible solution occurring in an apparently sudden and unexpected manner following a period of rest and recovery. To this sequence of events, Poincaré added the requirement for a second period of conscious work following the inspiration or illumination. Wallas (1926) assigns to these aspects of creative thinking the labels: (a) preparation, (b) incubation, (c) illumination, (d) verification, the existence of which has been justified by Patrick (1935, 1937, & 1938) in her detailed and elaborated experiments. Rossman (1931) presents a scheme of creative thinking process in terms of seven steps which very closely correspond to Dewey's (1933) steps of reflective thinking process. Wertheimer (1945), however, is skeptical about accepting the sequence of well defined, universal, clearly recognizable, successive, and distinct phases of creative thinking. He conceives of creativity more or less in holistic terms—a total pattern of behaviour in which various processes overlap and interweave between the occurrence of the original stimulus and the formation of the final product. Studies by Lowes (1930), and Wethercot
(1931) confirm the belief that creative process runs parallel, interleaving courses. It led Vinacke (1952) to conceive of creative thinking process in terms of dynamic interplaying activities with a chain of inspiration and incubation rather than as more or less discrete stages.

Formulated in still broader terms as Hutchinson (1940) and Murphy (1947) show, a particular creative situation is but a tangible focusing of creative thought drawing together at one time and to one purpose all four processes. The creator, for example, collects material for expression during his entire life time up to that time (preparation), and these materials become part of the unconscious equipment of the individual (incubation). These ideas or related ones reappear many times in new context and in new organizations (illumination) prior to a given creative situation, and the creator has previously acquired the techniques and refined skills of the method of expression (verification). The four aspects of creativity overlap and intermingle which in a particular creative situation are almost simultaneously evoked in the creator. A particular creative situation is, thus, but one temporary period in which all four processes are drawn together in relation to a particular object of creation.
MEASUREMENT OF CREATIVITY

Each one of the several definitions of creativity as cited earlier in this Chapter has implications for the measurement of creativity thereby suggesting multiplicity of approaches. As a consequence of it, the research worker gets stranded in the quagmire of problems as to the nature and content of criteria and predictors. The difficulty in identifying the criterion has been expressed by Guilford (1950), Brogden and Sprecher (1964), Taylor and Holland (1964), Yamamoto (1964b), and Taylor and Ellison (1972). The problem of criterion, in the words of Shapiro (1965), in a sense, is simply the problem of how to identify the creative person or how to identify the creative worth of the product of the individual. It gives rise to certain basic issues centering around (a) cognitive and non-cognitive criteria (Guilford, 1950; Mackinnon, 1962b), (b) single criterion and multi-criteria (Taylor and Ellison, 1972) and (c) individual and society as focal to the criterion (Yamamoto, 1964b). These sets of criteria, however, do not always agree with each other. Brogden and Taylor (1950) refer to the complexities arising out of bias effects characterized by criterion deficiency (omitting important elements), criterion contamination (introducing extraneous elements), and criterion distortion (improper weighting in combining criterion elements). Such issues and imperfections can considerably influence the measurement of creativity.
Complexities of the task of measurement of creativity is further borne out by the lack of agreement regarding the selection and identification of characteristics representative of intellectual, non-intellectual and situational factors singly or collectively, as predictors of creativity. In this way, the twin problems of criterion and predictors of creativity seem to run concurrently.

Besides, research workers are generally confronted with other difficulties related to (a) frequent fluctuations in creative performance (Guilford, 1950); (b) methodological complexities involved in developing the tools and techniques of measurement including an element of subjectivity in scoring (Guilford, 1950; Getzels and Jackson, 1962); and (c) securing creative subjects, obtaining cooperation of especially younger children, and evaluating young children's responses (Starkweather, 1964), which complicate measurement of creativity.

Nevertheless, persistent and painstaking research efforts have been continually directed towards measurement of creativity by employing different types of media and methods of investigation depending upon specific situation. Taylor and Holland (1962) submit classification of prevalent measures in terms of (a) traditional measures such as school grades, accumulation of knowledge, and intelligence tests; (b) multivariate approach covering the cognitive factors.
recognized through the factor analytical studies by Guilford et al. (1951, 1952), Thurstone (1952), and Wilson et al. (1954), and also involving non-cognitive measures such as motivational, biographical, sociometric and other personality characteristics; and (c) single test approach followed by Stein (1956), Springbelt et al. (1957), Schumacher and Clark (1957), Taylor (1958), Roe (1958 & 1959), Mallins (1959), Cattell (1959), Ellison (1960), Taylor et al. (1961), Holland and Austin (1961) and Smith et al. (1961). To these, battery of tests approach followed by Wallach and Kogan (1965) and Torrance (1966) may also be included.

A variety of tools such as check list, the word association test, interest and temperament inventories, personality inventories, self-ratings, supervisor's ratings, peer-nominations, and problem solving tests have largely been used to measure creativity. Attempts have also been made to predict and assess creative behaviour by taking into account the environmental factors.