CONTINUITY AND CHANGE IN ART

The Development of Modes of Representation

Sidney J. Blatt

in collaboration with
Ethel S. Blatt

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Routledge
Taylor & Francis Group
New York London

First Published by
Lawrence Erlbaum Associates, Inc., Publishers
365 Broadway
Hillsdale, New Jersey 07642

Transferred to Digital Printing 2009 by Routledge
270 Madison Ave, New York NY 10016
27 Church Road, Hove, East Sussex, BN3 2FA

Library of Congress Cataloging in Publication Data

Blatt, Sidney J. (Sidney Jules)
Continuity and change in art.

Bibliography: p.
Includes index.
1. Visual perception. 2. Art and society. 3. Art—Psychology. 4. Painting—Psychological aspects.
I. Blatt, Ethel S. II. Title.
N7430.5.B55 1984 750'.1'9 84-4201
ISBN 0-89859-342-5

Publisher's Note

The publisher has gone to great lengths to ensure the quality of this reprint but points out that some imperfections in the original may be apparent.

To our family —
past, present, and future.

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Preface

Jean Piaget's extensive studies of individual cognitive development were based on a fundamental assumption—that his observations define a genetic epistemology, a theory about the natural evolution of knowledge that occurs in multiple contexts. Piaget assumed that his observations about the structural development of thought in the individual were applicable to the study of culture as well; he assumed that there is a fundamental parallel in cognitive development in individuals and in culture. Although there has been considerable investigation of individual psychological development based on Piaget's formulations, relatively few studies have examined Piaget's hypothesis that his observations are equally applicable to cultural development. This book is an attempt to test this hypothesis—to examine the extent to which a theory of cognitive development gained primarily from the study of individuals can provide understanding of sequences in cultural development.

This book considers the development of the concept of the form of objects and of space in the history of art and science in Western Civilization and examines the extent to which this process follows the basic developmental principles articulated in Piaget's genetic epistemology. The model of cognitive development, presented in Chapter 2, derives primarily from the work of Jean Piaget and Heinz Werner, and as extended by investigators in developmental psychology including Larendeau and Pinard, Olson, Feffer, Gardner,

Kaplan, and Dolle. These observations and formulations of developmental psychology are supplemented by concepts from developmental psychoanalysis, particularly the important issue of the development of the subjective vantage point and its essential role in the development of the capacity to represent the three-dimensional form of objects and of space, and to use affects as a source of information about the personal meaning of experience.

This developmental psychological model is applied to an examination of the development of the capacity to represent the form of objects and of space in three major epochs in the history of Western Civilization: from Ancient to Medieval, from the Renaissance to the Baroque, and from Impressionism to contemporary time. Chapters 3, 4, and 5 consider the hypothesis that the modes of representing the form of objects and of space in painting follow a basic progression toward increased differentiation, articulation, integration, and complexity. While cultural development, like individual development, does not follow a fixed, monotonic, linear sequence without variation, reversions, or sudden surges of progress, it does proceed systematically toward developmentally more advanced levels of representation. This is not a progression toward a fixed, predetermined, ideal goal or telos, but a natural, unending, developmental unfolding. Such a developmental progression does not lead to any conclusion about the importance or worth of earlier or later modes of representation. Instead, it simply assumes that different modes of representation occur in different phases of the developmental sequence and that later modes are built on earlier accomplishments and achievements. Such a developmental progression also does not imply a commitment to a conceptualization of a "recapitulation" across contexts or of ontogony and phylogony. Rather, it is based only on the assumption of a "formal parallelism" (Brunswik, 1959) in the development of all cognitive endeavors whether they occur in the culture or in individual psychological development.

Individual and cultural development of modes of representation unfold from an initial mode based primarily on the extension of action sequences (a sensorimotor mode), to an intuitive coordination of a few dimensions (a preoperational-intuitive mode), to a systematic coordination and integration of different dimensions of the manifest, external form of objects (a concrete operational mode), to the coordination and integration of more abstract, internal form and structure

(a formal operational mode). This developmental sequence also involves a progression from an initial emphasis on the surfaces and boundaries of objects in isolation (topological concepts of space), to an emphasis on the relationships among different parts of a single object or among different objects in space that are initially specified intuitively and later in increasingly precise mathematical terms (projective-Euclidean concepts of space), to an emphasis on space, not as an absolute, but as defined in reference to the particular location and movement of a participant-observer (Riemannian concepts of space). This progression essentially involves the development of increasingly complex mathematical concepts and scales (Stevens, 1951) proceeding from a nominal scale in which observations are placed in discrete, mutually exclusive categories; to an ordinal scale in which observations are placed in a simple qualitative, comparative order based on comparison and contrast; to an interval scale in which the relationships among observations are defined by a common, but arbitrary, quantitative metric system; to a ratio scale in which observations about the relationships among objects are defined by a precisely defined metric system based on an experientially relevant reference point and scale values. Although there are periods of cultural development that contain ambiguous and at times inconsistent data, such as the occasional foreshortening and the sense of action in the animal forms of Paleolithic art or the undulation in modes of representation in art during the complex and controversial Middle Ages, there is a major progressive linear trend in the cultural development of modes of representing the forms of objects and of space on a two-dimensional surface.

Art is an integral part of the culture's predominant mode of conceptual or symbolic construction. Thus, the different phases in the development of modes of representation do not occur in painting alone. Painting is only one expression of a basic *Weltanschauung* that appears in the interests and preoccupations of a culture and in its multiple cognitive endeavors. The natural sequence in the development of modes of representation may be particularly apparent in painting, but it can also be observed in the concepts of natural science. Thus, at the conclusion of Chapters 3, 4, and 5, the parallels between the forms of objects and of space in painting and in science are explored. Also, in each chapter some consideration is given to relationships between the concepts of the form of objects and of space

and the general world view of the period, especially the development of concepts of perspective and infinity and their relationship to cultural humanism and the emphasis on the individual during the Greco-Roman period and in the Renaissance.

There are, however, inherent limitations to this analysis of the development of modes of representation, because psychological processes and cultural phenomena are at different levels of discourse and utilize different concepts and notational systems not easily transferred from one area to another. The term representation, for example, has different meanings in different areas—in painting it refers to technical procedures for recreating a segment of nature on a two-dimensional surface, in psychological theory the term refers to a construction of a sense, image, or conception of a segment of nature in one's mind, and in science the term refers to a model of a physical structure. Yet, in all these realms, representation refers to a process of symbol construction and in this sense they are equivalent terms despite differences in the media in which the symbol construction occurs. Another limitation in this study of changes in the representation of the form of objects and of space in painting is that a host of other dimensions important to painting are ignored, as are other artistic forms, such as sculpture, architecture, literature, music, and dance. Also, the investigation of a long-term developmental sequence tends to omit fine-grain analyses of particular periods and by necessity some important artists and important periods. And a consideration of a long-term developmental sequence does not preclude the possibility that some subcycle sequences occur within shorter time periods. Further, the use of a psychological analysis based on the development of concepts of the form of objects and of space ignores other psychological processes such as the development of concepts of time, causality, and affects.

Despite these limitations, cultural continuity and change as seen in the modes of representation of the form of objects and of space in painting and in science follows a basic developmental progression. In subsequent research, it would be valuable to consider the application of developmental psychological principles to a more detailed analysis of particular periods, to the study of other art forms such as sculpture and architecture, or to the long-term development of psychological dimensions other than the form of objects and of space, such as concepts of time and their developmental unfolding in literature, poetry, and music.

From the inception of this book in 1975, I have been keenly aware that this has been an ambitious undertaking. It has been a labor of love that has given me moments of great exhilaration that came with insight and discovery, and moments of despair. I have been tempted several times since beginning this effort to abandon the project because I felt overwhelmed by the range of material I was seeking to understand and integrate. Support of friends and colleagues, as well as the excitement of interdisciplinary synthesis, however, provided the impetus to continue. I present this material to colleagues in my field, not as an art historian, but as a psychologist and psychoanalyst interested in cognitive processes, with the hope of encouraging further exploration of cultural phenomena and the use of psychological theory in interdisciplinary investigation.

Over the years, much of my research as a psychologist and psychoanalyst has been in the area of cognitive processes and especially the development and impairment of mental representation in different forms of psychopathology. Thus, this work on the development of cultural modes of representation is an extension of my prior work. My interest in the application of individual psychological concepts to cultural phenomena has been stimulated in part by the interdisciplinary emphasis that has developed at Yale and in the New Haven community in the past decade. Of particular relevance has been the Kanzer Faculty Seminar in Psychoanalysis and the Humanities, as well as the work of several colleagues at the Western New England Institute for Psychoanalysis, especially Drs. Hans Loewald, Theodore Lidz, and Stanley Leavy. Dr. Leavy's seminar on structuralism, offered in collaboration with Professor Edward Casey of the Philosophy Department at Yale, was of special importance to me.

This study of cultural development would not have been possible without the collaboration and advice of numerous friends and colleagues. I am grateful first and foremost to Ethel, my wife and collaborator, who introduced me to the excitement of art history and guided my studies in this area. These experiences have enriched my life and provided the basis for this work. My interests in concepts of form and of space derive partly from my earlier collaboration with Dr. David Roth in which we investigated concepts of space in different types of psychopathology.

A primary factor facilitating my work on this book was the opportunity I had to spend an academic leave in 1977 at the Warburg Insti-

tute for Renaissance Studies. I am grateful to Professor Joseph Trapp, Director of the Warburg, for his generous assistance and for providing me access to the resources and facilities of the Institute. Sir Ernst Gombrich was generous of his time and comments. Although impatient with a developmental psychological analysis of cultural phenomena, Professor Gombrich's incisive comments and criticisms forced me to clarify further many of my concepts and assumptions. Dr. Kim Veltman, a former student and colleague of Sir Ernst, enriched my stay at the Warburg both personally and professionally. His comments and criticisms of an earlier draft of this manuscript contributed substantially to my understanding of aspects of the history of art and science. Likewise, Professor Michael Gross of Hampshire College provided consultation in the history of science and he patiently reviewed several drafts of the manuscript. His advice, consultation, and encouragement were important at critical moments. Professor Stanley Weintraub of The Pennsylvania State University read an early draft and provided constructive criticism. Professor Michael Kubovy, of Rutgers University, also reviewed the entire manuscript; Professors Jean Schimek of New York University, Gerald Gratch of the University of Houston, and Stanley Rosenberg of Dartmouth College reviewed the introductory theoretical chapter and Chapter 2, the developmental psychological model, and I am grateful to them for their advice. Numerous friends and colleagues at Yale shared observations and thoughts during the course of this work including Professors Joel Allison, Marshall Edelson, Jack Greenberg, Harry Frankfurt, Anne Hanson, Geoffrey Harman, Jay Hirschfield, Irving Janis, Walter Kahn, Hillel Levine, Theodore Lidz, Lottie Newman, and Jerome Singer. Portions of this manuscript were presented at the Kanzer Faculty Seminar in Psychoanalysis and the Humanities at Yale on March 27, 1980, and I am grateful for the comments of the participants of that meeting, especially Professor Anne Hanson. I am also grateful to the participants of an undergraduate senior-graduate seminar I offered at Yale on this topic in the spring of 1979, and especially to Professor Jean Henry of the University of New Haven who participated in that seminar and later also reviewed the entire manuscript. Editorial advice and consultation were provided by Professor Adrianne Munich, Rosemarie Wellner, and Henry and Susan Schwab. Several research assistants and secretaries contributed to this work over the years, including Dr. Mary-Rose Coiner, Barbara MacKinnon, Meg Turner, Janet Stein, Janet Powell, Toni Suarez, John and Judith Casey, and Suzanne Whang.

I am also indebted to Helen Chillman, Librarian of the Slides and Photographs Collection at Yale, and to her assistant Ann Gaspari, for their assistance in locating the illustrations for this book. Illustrative material was obtained from the following sources and I am grateful for their assistance: Alte Pinakothek; Alinari (E.P.A.); Archives Photographiques; Art Gallery of Ontario; Art Institute of Chicago; Bayerische Staatsbibliothek; Bibliothèque Nationale; Brera Gallery; British Library; British Museum; Cairo Museum; Courtauld Institute Gallery; Carlo Gandini; Photographie Giraudon; Professor P. Graziosi; Hirmer Verlag; Hirshhorn Museum and Sculpture Garden of the Smithsonian Institute; Houston Museum of Fine Art; Kunsthistorisches Museum; Larousse; Louvre; Martinus Nijhoff; Mauritshuis at the Hague; Metropolitan Museum of Art of New York; Michigan-Princeton-Alexandria Expedition to Mount Sinai and Professor Kurt Weitzmann; Museum of Modern Art; National Gallery, London; National Gallery, Washington; National Museum, Athens; National Museum, Naples; Philadelphia Museum of Art; Prado; Princeton University Press; Rijksmuseum; St. George's Gallery; Studelsches Kunstinstitut; Tate Gallery; Uffizi Gallery; University of Chicago Press; The Vatican; Villa Giula Museum; Wallace Collection; Mrs. John Hay Whitney; Professor Neil Welliver; Yale Center for British Art; and Yale University Art Gallery.

I want to express my appreciation to Lawrence Erlbaum and his associates, Jack Burton and Philip Young. They have been more than just publishers in their interest in and commitment to this book.

Finally, I want to express my gratitude to the A. Whitney Griswold Fund of Yale University for its support of this endeavor.

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February 1, 1984
Woodbridge, Connecticut

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The Form of Objects and of Space in the History of Art

INTRODUCTION

In a provocative and controversial statement, Erwin Panofsky (1924/25) discussed the representation of space in art as a symbolic form that reflects the *Weltanschauung* of its period—the culture's conception of nature expressed in the form of objects and of space. Panofsky was particularly interested in the development of linear perspective as the symbolic form of the Italian Renaissance and how it reflected the culture's view of space as infinite, homogeneous, and isotropic. But he stressed that while linear perspective was a unique and most realistic representational construction, it was only one phase in the development of symbolic form, or modes of representation, in the history of art. The goal of this book is to explore the sequences through which the modes of representing the form of objects and of space have developed in the history of painting and to consider these modes of representation as expressions of the symbolic form and the predominant world view of major epochs in the history of Western Civilization.

The form of objects and of space is a basic aspect of human consciousness, a basic dimension for experiencing and understanding nature. Form defines the intimate relationships between individuals within a culture and the relationship of the culture to nature (Focil-

lon, 1934/1948). Concepts of form and of space are evolving conceptual structures, inherent and basic to the multiple cognitive endeavors of a society—its art, literature, philosophy, and science (Jammer, 1954/1969). Form is the very essence and substance of art and the tendency to create "new families of form" is a primary characteristic that defines particular periods of art (Focillon, 1934/1948). A fundamental hypothesis of this book is that the creation of these families of form and concepts of space follow a basic, natural, developmental progression toward increasing differentiation, articulation, integration, abstraction, and complexity.

Throughout history, from Paleolithic to contemporary time, there have been consistent and systematic changes in the mode of representing a segment of nature on a two-dimensional surface. The development of a new mode of representation in painting involves a cognitive-perceptual reorganization and the construction of new cognitive schemata (Olson, 1970). These new cognitive schemata are the consequence of artists' attempts to revise and extend modes of representation already available in the culture. Changes in the modes of representation in the history of art have followed a fundamental developmental progression that is characteristic of all cognitive, intellectual endeavors. This progression occurs in cultural development, in art, literature, and science, as well as in the psychological development of the individual. There is a "formal parallelism" (Brunswik, 1959; Kaplan, 1966; Piaget, 1971; Werner, 1948, 1957; Werner & Kaplan, 1956, 1963) in all cognitive development. Understanding the structures of cognitive development in one domain provides guidelines for understanding development in other domains. Thus, the extensive understanding that has been achieved about the developmental unfolding of cognitive processes within the individual (e.g., by Piaget and Werner) provides a model for the study of cultural development and particularly changes in modes of representation in the history of painting. It was for these reasons that Piaget thought of his discoveries in developmental psychology as defining a genetic epistemology.

To use a psychological model of the individual's development of cognitive processes for the study of cultural phenomena does not imply that earlier levels of cultural development are either childlike or primitive. Because they are earlier in development they are less differentiated, articulated, and integrated, but they are neither childlike nor primitive. Earlier levels are, in fact, vital steps that capture

and highlight certain experiences or dimensions that may be lost in subsequent elaboration and complexity. A model of cognitive development, equally applicable to individual and cultural development, assumes only a formal parallelism among developmental sequences in a variety of endeavors. This developmental sequence is "an ideal or natural order" (Toulmin, 1953, 1972) that can be studied in diverse contexts without any assumption of priorities among the various developmental sequences. There is no commitment to a "recapitulation" across contexts or of ontogeny and phylogeny, only an assumption of parallel sequences in various contexts. Earlier developmental phases are essential steps that are integrated hierarchically in more differentiated, articulated and integrated constructions (Werner, 1948; Werner & Kaplan, 1963).

While there are many dimensions that must be considered in a full analysis of cultural development, the representation of the form of objects and of space is central. The structural organization inherent in the representation of form and space expresses the general conceptual schemata of the society, what Foucault (1970) calls its cultural episteme. Changes in this structural organization reflect transformations in the culture's interpretation of the universe (e.g., Frankl, 1960; Malraux, 1954; Panofsky, 1924/25; Riegl, 1901/1927; Weitz, 1970; Wölfflin, 1915/1932). Changes in the representation of the form of objects and of space are structural changes that are expressed in the multiple cognitive endeavors within the cultural period. Each cultural epoch is a complete and articulated whole (Burckhardt, 1860/1950), with a particular cognitive organization that is expressed in its art, religion, science, and social order. At the height of each culture there is a structural unity of the elements of the culture (e.g., Burckhardt, 1860/1950; Dilthey, 1927/1957; Dvořák, 1918/1967; Gombrich, 1969a; Hauser, 1951/1960, 1965; Lovejoy, 1936/1964; Panofsky, 1960/1972). This structural unity, derived from the social structure, values, meanings, and *Weltanschauung* of the culture, is expressed in the configurations of art, literature, music, poetry, philosophy, theology, and science. An analysis of the predominant mode of representing the form of objects and of space in art can aid in the identification of the conceptual structure and unity inherent in the multiple cognitive endeavors of the major epochs in the history of Western Civilization.

Numerous art historians, beginning with Johann Winckelmann, Jacob Burckhardt, Alois Riegl, Max Dvořák, and Johan Huizinga,

considered art history within the broad context of cultural and intellectual history. They believe art reflects the *Weltanschauung* and provides insight into the thought, will, and feeling of the historical period. Art is an expression of the period and it reflects the attitudes and institutions of its time, but it is only one of many expressions of the basic cognitive structure that underlies all intellectual endeavors of the society. Art is "part of the history of ideas, of the development of the human spirit" (Dvořák, cited by Antal, 1949a, p.49); it is a historical document of the individual artist and the prevailing *Weltanschauung* and style of the particular period (Kleinbauer, 1971). But as stressed by Benjamin (1977), the meaning of the style and the period can be fully realized only subsequently as the relationship between the style and its period become clarified. Art is an expression of its time, but its full meaning can only emerge with time. Art can only be understood in a historical context; the potential importance of a contribution is discernable only with the passage of time, in relation to its prehistory as well as its post-history (Benjamin, 1977). "To explain a style can mean nothing more than to place it in its general historical context and to verify that is speaks in harmony with other organs of its age" (Wölfflin, 1898, p.79; see also Schapiro, 1953). Art, as an aesthetic and cognitive expression of the intellectual conceptions and experiential forms of a society, has its origins in the historical process (Pepper, 1942). While it is logically impossible to predict the future course of history (Popper, 1957), it is possible subsequently to discern and specify the systematic principles involved in revisions of artistic style and in the reorganization of the cognitive structures that are basic to the various epochs in Western Civilization.

In this book we seek to articulate a theoretical model of the development of the capacity to represent the form of objects and of space and to apply this model to the study of changes in modes of representation in the history of painting. This attempt to identify the conceptual structure inherent in major epochs in the history of art is congruent with the persistent call of many art historians for the establishment of a "vocabulary of form," a "system of schemata" (e.g., Gombrich, 1960), or a "semantics of the visual arts" (Janson, 1961) that can provide a consistent theoretical matrix for art historical analysis. We also seek to demonstrate that the modes of representing the form of objects and of space in art express important dimensions of the culture's fundamental cognitive structure that is inherent in its multiple cognitive endeavors, especially in its conception of the uni-

verse. This cognitive analysis of cultural development is consistent with the contemporary emphasis upon structuralism as a theoretical orientation and as a method of inquiry.[1]

This introductory chapter considers some of the basic theoretical assumptions involved in evaluating patterns of cultural change through a structuralist analysis of the modes of representing the form of objects and of space in the history of painting. The second chapter presents a model of individual development of the capacity to represent the form of objects and of space. This model is based on an integration of cognitive developmental and psychoanalytic theory and research. Chapters 3, 4, and 5 apply this psychological developmental model to an analysis of the changes in the representation of the form of objects and space in art in the major epochs of Western Civilization. The concluding sections of Chapters 3, 4 and 5 consider the parallel

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[1] In addition to the study of the development of cognitive structures through history (a diachronic analysis) and their simultaneous expression in the multiple cognitive endeavors of a culture (a synchronic analysis), one can also investigate the relationships of the development of these cognitive structures to major changes in social organization—the influence of economic, political, and social forces on the intellectual endeavors of a society (a dynamic-causative analysis). The search for causal explanations for the appearance of cultural phenomena assumes a complex transaction between art and the embedding culture, in which the culture stimulates the art, and the art, in turn, has important functions within the culture. A dynamic-causal analysis integrates cultural and intellectual history with social history in order to understand the social, political, economic, religious, and psychological factors as the context from which fundamental ideas of the culture emerge (e.g., Antal, 1953b; Hauser, 1951/1960; Schapiro, 1953). Hauser (1951/1960), "in the most ambitious and most adversely criticized social history of art" (Kleinbauer, 1971, p. 77), examined the role of economic and social forces in creating changes in artistic style. He viewed, for example, the 16th century Mannerist style "as an expression of the unrest, anxiety, and bewilderment generated by the process of alienation of the individual from society and the reification of the whole cultural process" that was part of the social crisis of the 16th century (Hauser, 1965, p. 111). Likewise, Antal (1953) discussed the neoclassicism and romanticism of the 18th century as a characteristic bourgeois outlook on the eve of revolution (Kleinbauer, 1971). Though there is considerable controversy about the more neo-Marxist views (e.g., Antal, 1953; Hauser, 1951/1960) that social, political, and economic conflicts and upheaval are the activating force that creates cultural change, most art historians generally agree that the structure and content of art express the historical, social, political, scientific, religious, and economic tendencies of the period.

between the development of modes of representing space in art and the development of concepts of space in science and cosmology. This analysis is based on Panofsky's (1924/25) hypothesis that aesthetic and scientific concepts of space develop in an interdependent fashion. Art and science are two major conceptual schemes for representing nature. Though the concepts of space are expressed in somewhat different terms in the two disciplines, they evolve from the same cultural matrix (Gabo, 1937). Thus, the development of modes of representation of space in the history of art should be paralleled by similar changes in the development of the concept of space in science.

In these latter chapters we also seek to demonstrate that changes in conceptual schemata involve revisions in the fundamental metric and mathematical structure utilized by the culture. These changes in basic mathematical structure range from an initial emphasis upon simple nominal designation, to ordinal sequences based primarily on qualitative comparisons, to more complex, quantitative, interval metrics established in terms of arbitrarily defined reference and scale points, and later, to an emphasis on quantitative ratio scaling defined in terms of stable, consistent, numerically and experientially relevant, reference and scale points (Stevens, 1951).

PATTERNS OF CHANGE

The representation and conceptualization of space in art and science characterize the *Weltanschauung* of a culture. Changes in social conditions and increases in knowledge create a social climate in which innovative individuals within the culture can develop a new mode of representation that resolves ambiguities, inconsistencies, and contradictions that have become increasingly apparent about current as well as previous modes. The history of art and the history of science are both part of a basic cultural developmental progression toward increasing levels of differentiation and integration. The transitions between stages of this developmental progression are the result of attempts to resolve dilemmas, inconsistencies, and contradictions that become apparent with sufficient mastery of the then-traditional modes of conception and representation. As Schäfer (1919/1974, p. 149) noted, "one generation takes up the representational types of another and hands them on because that's 'how it is done'. *The great force of tradition is at work.*" (Schäfer's Italics). But the new is not simply

a continuation of the old; it involves a transformation of structure, meaning, and function in the creation of a new style that integrates and extends previous styles (Hauser, 1953/1959).

The representations of space in art and science are essential parts of a continuous transformation of society's understanding of nature. Major changes in the conception of space mark particular nodal points in the history of civilization. While there are interruptions and discontinuities as well as long periods of stability in cultural development, there is also a basic continuity in the major transformations of the conception of space. Concepts of space are constructions of human thought that express the society's attempt to develop conceptual schemes for understanding nature. Major transformations of these schemes usually evolve through a long and continuous process and they eventually pervade the entire society.

Transformations of the modes of representation and conceptualization of space in art and science are built upon prior stages. Developments in the modes of representation progress, although sometimes somewhat erratically, toward greater complexity and diversity. Individuals and cultures weave diverse elements into coherent wholes within their own age or epoch. Successive waves of intellectual and conceptual revolution are dynamic transformations of structures that result, at least for a time, in an era of relative intellectual calm and stability (Kuhn, 1962/1970). As Kuhn has articulated, the everyday activity of "normal science" (and art) is guided by existing "paradigms"; but this eventually leads to contradictions and an awareness of inadequacies and inconsistencies in the paradigm. Eventually, these anomalies inspire pioneers to seek a new and possibly discontinuous (and, at times, initially disconcerting) innovative paradigm that provides a resolution and integration for the anomalies. Innovations usually occur at a time of social freedom and stability and are part of a much broader social transformation. New conceptual structures often appear as a "conversion experience" (Berger & Luckmann, 1966; Kuhn, 1962/1970). Innovation in science and art is often produced by a comparative outsider to an ongoing tradition, but nonetheless one with a competent grasp and mastery of the existing paradigm, but only after a relatively brief period of exposure—brief enough to have avoided developing a full and intense commitment to it. Innovation is achieved by individuals who possess both a competence and a comprehension of the current world view as well as some psychological distance, distress, confusion, and unrest.

An emerging new conceptual matrix, often embodied by a new social group, and an individual sense of personal crisis as well as competence, lead some people of remarkable talent to articulate a new conceptual structure that resolves the anomalies and inconsistencies for the new social movement as well as for themselves (Berger & Luckmann, 1966; Kuhn, 1962/1970).

Moore (1963/1974) discussed a number of basic patterns of cultural change. Change can be "gradual or rapid, peaceful or violent, continuous or spasmodic, orderly or erratic." Change can occur in a repetitive, "trendless cycle" (p. 44) in which themes of rise and decline occur in successive reoccurring sequences. Change can also occur as an evolving long-term developmental process that follows a simple, gradual, continuous, monotonic, linear function. There can be various discontinuities, stages, minor undulations, uneven rates, or subtle short-term cycles within a long-term developmental process. In long-term change there can also be temporary retrogression followed by a sudden, rapid, extensive developmental surge. One alternative to a long-term linear developmental progression is a pattern of change that combines both a unity and a diversity of change within a single conception of a "branching evolution" (p. 39). This allows for the specification of a single developmental line as well as branching processes that proceed at different rates and in somewhat different directions. There are also processes of change that can be described as asymptotic or exponential in which there are markedly different rates of development either early or late in the process. Moore points out, however, that the pattern of change can depend upon the time periods and the observational units used, the details demanded, and whether the data are essentially qualitative or quantitative. Quantitative data allow for much greater diversity and precision in the description of the patterns of change. Moore cautions that value judgments can influence a formulation of change associated with progress and maturity or with a retrogressive return to a prior "happy" or "Golden Age." But, as will be stressed throughout this book, distortion in evaluating change in the history of art can be limited and contained by specifying variables and dimensions in a theoretical system established and defined independent of the phenomena to be evaluated. A theoretical model of the psychological development of concepts of space provides a model that has validity external to the development of modes of representation in art. Therefore it can limit the intrusion

of value judgments in the investigation of changes in modes of representation in the history of art.

Different types of patterns of change of style have been discussed in the history of art, including cyclical, polar, and progressive developmental theories, and various combinations of these (Kleinbauer, 1971; Schapiro, 1953; Weitz, 1970). In a cyclical theory, each stage has a characteristic style and the stages follow an irrestible course, often based on a biological analogy of the natural life cycle from birth, infancy, maturity, senility to death. There is an implication within each style of a rise, growth, and eventual decline and decay. Schapiro (1953) notes that there can be short-term cycles within one or more periods, such as the rise and fall of a Greco-Roman or a Gothic style, or there can be long-term cycles. Schapiro (1953), however, finds these cyclical theories unconvincing because new styles are often created without the complete decline of a preceding style. Winckelmann (1764) was the first art historian to articulate a normative historical course marked by repeated phases of growth, decline, and decay. In the mid-18th century, he discussed Greek sculpture as proceeding from origins, to mature perfection, to a decline and fall and applied this biological analogy to the various periods, especially the history of ancient art. Actually, Vasari (1550/1965) had developed a similar scheme in his analysis of the lives of Renaissance artists when he discussed the infancy, adolescence, and maturity of the Renaissance (Kleinbauer, 1971).

Cyclic conceptions of changes in style are often based on a definition of a set of polarities, and changes are described as recurrent movement between two poles either within, or across, periods of style. Alois Riegl (1858–1905) was among the first art historians to offer an alternative to the conception of Winckelmann by regarding the progression from archaic to classical art as a single developmental process across two antithetical categories or poles of perception that he termed "haptic" (tactile) and "optic" (visual). He considered this process a basic universal principle that determined change in style both within particular eras as well as over much longer time spans in the history of Western Civilization.

One of the most influential polar conceptions in art history was Wölfflin's (1915/1932) formulation of five polarities that he used to contrast the art of the Renaissance with that of the Baroque. Wölfflin's polarities include linear and painterly, planar or parallel

surface form and diagonal-recessional depth, closed (tectonic) and open (atectonic) form, composite and diffuse composition, and clear and unclear form. These five polarities defined two major modes of vision, the "linear" and the "painterly." According to Wölfflin, there is an immanent, inevitable development that has an internal logic, which can proceed in only one direction—from linear to painterly. For Wölfflin (1915/1932, p. 18), the painterly mode "is not truly intelligible without the earlier" linear mode. Wölfflin's morphological analysis of visual modes and his emphasis on visual forms were particularly effective in the study of the art of the Renaissance and the Baroque. Wölfflin believed that these polarities were applicable to the entire history of art as well as to development in literature and science.

There is considerable controversy about Wölfflin's formulations. Schapiro (1953) and Hauser (1953/1959), for example, note that throughout the history of art there have been various combinations of these polarities, and the second pole does not necessarily follow from the first one since other options exist. Paul Frankl (1960) integrated Wölfflin's polarities with a cyclical conception of preclassic, classic, and post-classic periods of being and becoming that occur in the repetitive movement through these polarities in the development of elementary forms (Kleinbauer, 1971; Schapiro, 1953). In addition to Wölfflin's five antithetical polarities and Riegl's (1901) haptic and optic modes of perception, there have been other polarities used in the history of art such as idealism and naturalism (e.g., Dvořák, 1918/1924), geometric or abstract and organic or naturalistic (e.g., Worringer, 1907/1953).

Some art historians discuss the development of artistic forms and styles as revisions and alterations of a prior mode, while others discuss a long developmental sequence throughout the history of civilization. Art historians discuss a variety of developmental sequences ranging from a short-term repetitive cycle to a long-term developmental process, but there is general agreement that the development of artistic forms and styles does not proceed toward a fixed or predetermined ideal style. Even within a long-term developmental process, progress in the development of artistic form is seen as based on revisions and extensions of prior forms and styles.

One of the primary models of change of style in the history of art is the conception of change as a continuous, long-term, developmental process. This linear conception of development is essentially Aristote-

lian (Kleinbauer, 1971) in its assumption of a serial developmental order from simple to complex forms. But such a model need not be a teleological conception of development as proceeding toward a predetermined, fixed, ideal goal (Kuhn, 1962/1970). Progress in art is viewed as developing out of a dialectic between currently available cognitive structures and the impulse to seek new understanding of nature and new symbolic forms. Revisions in style occur as the result of constant attempts to achieve and establish a more comprehensive understanding of nature through a repetitive process of thesis–antithesis–synthesis. Revisions of inconsistencies and contradictions in current modes of understanding and representing nature facilitate the development of more comprehensive cognitive structures. The rate of cultural change can be influenced by significant changes in the social context. Increases in knowledge and/or major revisions in social, political, and economic conditions facilitiate cultural development. New structures of artistic form are influenced primarily by the structure of prior accomplishments, but the rate at which structures are revised and transformed into new structures is determined primarily by social conditions. The concerns, interests, and preoccupations of a culture are reflected primarily in the content and themes of its art. Revisions and transformations of structures are determined primarily by the form and organization of the prior cognitive structures and the freedom within a culture to seek new understanding of nature.

A linear model of development is also Darwinian in that changes in the modes of representation are viewed as becoming increasingly comprehensive and complex through gradual modification as well as dramatic shifts (Kleinbauer, 1971). But it is important to stress that this progression is never exact and perfect. Given the broad sweep of any developmental sequence, there are occasional discontinuities and even temporary regressions or sudden progressions. As seen in the Middle Ages, or as Meiss (1951) so carefully documented in his study of the impact of the Black Death on painting in Florence and Siena from 1350 to 1375, major social upheaval can interfere and even cause short- or long-term temporary setbacks in the development of cognitive structures (Peckham, 1965). Thus, the delineation of a linear progression in cultural development need not be dependent upon the identification of a fixed, monotonic, linear sequence, but rather on the specification of a "curve of best fit" which, while not accounting for every observation, still accounts for a major portion of

the observations in a more precise form than alternative descriptions. Cultural development, like all developmental sequences, can have temporary reversions or proceed at variable rates at different times in the sequence, but a broad overview of the process indicates a clear developmental progression. Hauser (1953/1959, p. 224) stresses that continuous developmental progression is not simply a straight linear process; progress can be irregular and marked by disruptions, disturbances, and interruptions.

Kubler (1962) discusses continuous, long-term changes in the fundamental morphology of art. Kubler, in a historical, rather than a biological conception of time and change, describes the formal sequence of "linked solutions" of successive problems in art. Kubler examined the continuous change in the solution of artistic problems; these solutions are interrelated and open to revision and elaboration by new solutions. He sought to identify and describe the series of changes that occur in significant, minute, and, at times, dramatic variations and solutions. Early solutions (promorphic) are technically simple, energetically inexpensive, and expressively clear. Late solutions (neomorphic) are costly, difficult, intricate, recondite, and animate. Kubler used the terms promorphic and neomorphic to avoid more value-laden terms such as "primitive," "decadent," "archaic." Promorphic and neomorphic are determinants that are only relative to a "pertinent form-class . . . , (and) a defined starting point" (Kubler, 1962, p. 56). Inventions in art, according to Kubler, "are not isolated events, but linked positions" in a formal sequence. There is "a structural order in the sequence of inventions which exists independently of other conditions. . . . Under certain circumstances an inherent structural order in the sequence of new forms is readily apparent . . . where linked runs of related solutions follow one another in a recognizable order as if following out the conditions of a prior program common to these various evolutions" (Kubler, 1962, pp. 85–86).

Schapiro (1953, p. 303) also proposes a long-term developmental model in his discussion of progress from ancient Greek to medieval and modern western Europe as a sequence from "archaic linear" to "pictorial" representation and naturalistic art. Schematized representations of isolated objects are replaced by perspective representations in which there are "continuities of space, movement, light, shadow and atmosphere." Schapiro (1953), as Hauser (1953/1959), finds concepts of a continuous process in the history of art more accurate and convincing than the doctrine of inevitable cyclical recur-

rences. Schapiro believes that many of the cyclical theories of the history of art are essentially descriptions of shorter phases in the progressive development of representations, and he stresses the need to investigate the formal properties of the long-term developmental progression of various modes of representation.

The formulations of the history of art as a continuous developmental progression are often derived from the application of concepts of psychological theory to the history of art. Emanuel Loewy (1900/1907), for example, discussed the representation of natural forms as progressing from concrete representations based on a memory image of the actual object, to perspective representations based on a specific perception of the object. Loewy provided an articulation of the forms of archaic representation and their development through various stages to naturalistic art.

Riegl was among the earliest to conceptualize artistic development as a single, continuous process with transitions at world-historical epochs. His conception of progress was based on a move from the haptic (tactile) to the optic (visual) mode of perception, a long developmental process that extends across the entire culture. According to Schapiro (1953):

> The history of art is, for Riegl, an endless necessary movement from representation based on vision of the object and its parts as proximate, tangible, discrete, and self-sufficient, to the representation of the whole perceptual field as a directly given, but more distant, continuum with merging parts, with an increasing role of the spatial voids, and with a more evident reference to the knowing subject as a constituting factor in perception. (p. 302)

Riegl stressed the change from an objective to a subjective relation to the world. The object in the haptic mode is a concrete, tangible, self-contained, isolated entity. In the optical mode, the perceptual field is a totality in which objects and parts of objects are integrated with the surrounding space. The viewer has a conscious, self-reflective role in the representation of the perceptual field. The shift from a tactile to an optical mode of apprehending the world initially occurred with objects in isolation and later once again in the relation of objects to their spatial context. Though Riegl did not have available a sophisticated psychological or sociological theory, he developed a broad view based on a sensitive appreciation of psychological processes. He emphasized dimensions such as "will, feeling and thought"

as changing people from having "a predominantly objective to a subjective" relationship to the world. Riegl did not consider this shift from the objective to the subjective as simply "a development of naturalism from an archaic to an impressionistic stage," but as a consequence of fundamental changes in "the intimate structure of styles, the principles of composition, and the relations of figure to ground" (Schapiro, 1953, p. 302). For Riegl, the history of art is an autonomous dialectical process that expresses the development of successive world views.

There is considerable controversy and debate (e.g., Gombrich, 1960), however, about whether there is a long-term developmental sequence in the modes of representing the form of objects and of space in the history of art. These criticisms provide appropriate cautions about some of the limitations of such a hypothesis. Some art critics and historians (e.g., Ackerman, 1960; Croce, 1953; Venturi, 1936), for example, maintain that each work of art must be appreciated and understood in its own right as a complete, integrated expression of an individual artist within a particular cultural context. They believe that concepts of style or historical development cannot explain the creative endeavors of individual artists. Works of art can be understood only through an analysis of the artistic sensibility of the artist and the attitudes that prevailed at the time the work of art was produced (Kleinbauer, 1971). Ackerman (1962) maintains that an excessive concern with historical, developmental trends tends to diminish the appreciation of the artist and the work of art. He believes that art must be free of arbitrary classifications and should be appreciated and understood in terms of its own intrinsic qualities and cultural context. Art can best be understood by studying the creative activity of the artist, and not by formulating abstract constructs such as a myth of a developmental process. While Ackerman acknowledges that the artist does not work in a historical vacuum and has contact with a cultural context, he believes that art history needs to be particularly concerned with the autonomy of the individual work of art and the experiences of the artist who produces it. Ackerman stresses the need to appreciate art and the artist in terms of the historical, political, economic, social, and cultural context, and not as a point or place in a hypothetical developmental process. Despite Ackerman's concerns, it is possible that an understanding of a particular style within the context of a long-term developmental process may facilitate a fuller

appreciation of the emergence of that style in the work of an individual artist during a particular historical period.

Several art historians (e.g., Ackerman, Gombrich, Hauser, Schapiro) are concerned that the history of art not be fashioned like "another version of the materialist success story," (Ackerman, 1962/1967, p. 231), or Hegelian "romantic mythologies" of the "great drama of mankind's evolution from childhood to maturity" (Gombrich, 1960, p. 19). They are concerned that the primary judgment of the value of art would be based on an evaluation of the work's contribution to subsequent phases of the developmental sequence. In addition, Gombrich (1969a) rejects a Hegelian conception in which each cultural epoch is seen as a necessary stage in the progressive ascent toward a higher plane of articulation primarily because he rejects Hegel's underlying theological assumption that this process is an unfolding based on divine reasoning leading toward a preordained destiny or goal, that it is a search for the Absolute Spirit. Gombrich also rejects the conception of a progression in the development of artistic style because of Hegel's assumption that such a progression indicates that individuals, in the course of history, have undergone profound biological and psychological change. Because of these underlying theological assumptions, Hegel was unable to allow for the possibility that there could be temporary setbacks and declines in the attempt to achieve the Absolute Spirit. But one can consider the possibility of a long-term developmental progression independent of theological assumptions. Developmental sequences can emerge as revisions of prior stages without proceeding to a preordained goal, without judgments of intellectual, biological, or aesthetic superiority or inferiority, and with the possibility that temporary reversions can occur within the long-term developmental process (see also Gablik, 1976).

Many art historians object to suggestions that art history parallels individual psychological development. These suggestions raise anew the controversy, most prominent in biology, of ontogeny recapitulating phylogeny (see Gould, 1977). But a parallel in the development of art and individual psychological development need not be based on an assumption of recapitulation, but rather of assuming only a formal parallelism between developmental sequences (Brunswik, 1959; Piaget, 1971; Werner & Kaplan, 1963). Gombrich (1960) takes exception to the comparison of art history to individual development because he believes it is based on an implicit assumption that earlier

societies were as unskilled as children because they had the mentality of children or because they lacked the motivation to seek more complex modes of representation. Gombrich is concerned by the implications that modes of representation in earlier stages in the history of art be considered primitive and that early artists (or artists of any period for that matter) be considered biologically, psychologically, and intellectually inferior or childish. A developmental progression in the history of art, however, can be viewed as similar to developmental progression in the history of science. While Aristotle's concept of the universe, for example, may be simple and primitive in comparison to contemporary conceptions of the universe, one would not consider Aristotle biologically, intellectually, or psychologically inferior. Likewise, in the history of art, earlier modes of representation in art, although simple and primitive compared to later ones, are not the product of simple people or primitive minds. Gombrich (1977) himself, in fact, points out that art serves different functions in different societies (magical, religious, ceremonial, functional, and narrative) and different modes of representation are more effective for different functions.

Gombrich's objections to the formulation of a long-term developmental sequence in the history of art may be due, in part, to his reliance on a model based on perceptual theory and research. Perceptual processes are basically innate and essentially the same in form and structure in every culture. As Gombrich (1954) has commented, art has a history, perception does not. Thus, an analysis of art history based on a theory of perception could be interpreted as implying either cultural or biological inferiority. But throughout the history of civilization there has been a clear progressive development in modes of representation in art, literature, and science. An analysis of art history based on a theory of representation can acknowledge the important progressive contribution of prior cultures and societies without assuming aesthetic, cultural, or biological inferiority.

Cognitive structures develop over the epochs of civilization or the brief time span of the individual life cycle, in a basic progression toward increasingly complex, articulated, differentiated, and integrated forms. Prior phases provide the essential basis and matrix for subsequent development. The developmental progression of symbolic forms and of cognitive structures in individual and cultural development unfolds according to a basic structural pattern that occurs relatively independent of content. The basic dimensions of this natu-

ral developmental process can be observed and defined in a number of different areas of discourse. Probably because children provide an immediate availability of primary data and an endless opportunity for the direct observation of the various stages in the unfolding of this basic developmental sequence, the basic process of the development of cognitive structures and symbolic forms has been most fully described within the human life cycle. The development of cognitive structures in the child does not imply any judgment that earlier stages are inferior, primitive, or less valuable. Earlier stages in any developmental progression are less differentiated and less integrated than later stages, but each stage has its unique qualities and is an essential contribution to the basic developmental process. Understanding individual development may provide a model for differentiating and understanding parallel sequences in a variety of endeavors, including the history of art and the history of science. Such a developmental model can provide the concepts necessary for defining a "vocabulary of form" or a "system of schemata" that could be applied to the study of development of modes of representation and of symbolic forms in a variety of intellectual endeavors.

While in most developmental theories there is implicit admiration for higher levels of development and for the most advanced contributions, one cannot simply take for granted the impressive achievements of earlier stages of the developmental process. Earlier stages are major accomplishments and are essential for later development. Aspects from the contributions of each stage are retained in subsequent extensions, revisions, and transformations. In child development, the representations of early stages are often the modes for experiencing more direct, affect-laden experiences, particularly in bodily terms. Later stages of development contribute to more abstract and conceptual representations that allow for greater generality, but they may be somewhat removed from immediate, affective experience (Blatt, 1974). Concepts in art and science have evolved from being relatively simple and direct to being more complex and abstract, and this development can be described independently of any judgment about the value of the contribution or the mentality of the culture. There is little indication that basic perceptual processes or mental capacities have changed significantly since Paleolithic man. There is no doubt, for example, that individuals in early civilization perceived depth and had some conception of perspective. But it required time to conceptualize these experiences and to develop the

cognitive schemata and the techniques for representing three-dimensional experiences on a two-dimensional surface. Later epochs, building on earlier contributions, invented increasingly precise techniques for highly realistic representations of these three-dimensional perceptual experiences.

Gombrich, Ackerman, and Schapiro caution that there is a temptation to define any conceptualization of a process as a natural sequence because historical evidence highlights cause-and-effect sequences within the process. Ackerman (1962/1967, p. 231), for example, stresses that artists are not aware of what will succeed their work; they only know the past and the present, and they attempt to take "a step—sometimes a leap—away from the past." Ackerman, like Schapiro (1953), rejects a deterministic theory of a preordained pattern in the development of style in the history of art. They believe that in order to appreciate and interpret a work of art, we need to understand its context rather than its effect. Ackerman (1962/1967, p. 232) argues that the development of art should not be described as the succession of steps toward the solution of a problem, but instead as a "succession of steps away from one or more original statements of a problem." He argues that patterns can be detected because succeeding works both retain and reject aspects of prior statements. He points out that a pattern or configuration of change may appear purposeful or predestined only because each work retains aspects of its predecessor. Thus, unique contributions and innovations in style can often be coherently related to earlier works without necessarily defining an overall long-term developmental sequence or pattern. For Ackerman, changes result from probing the unknown, rather than from a sequence of steps toward a predetermined solution.

Ackerman takes the position that overemphasizing chronological succession should be avoided because it is based on the questionable assumption that each work of art is necessarily more closely related to its immediate predecessors than to works of an earlier stage or style. He considers works of art as occurring in an open system, as "a repository of experiences entering from every direction in the artist's surroundings" (1962/1967, p. 233), from distant as well as from recent past and from factors both within as well as external to the style itself. But Ackerman is also impressed with the similarity of sequences and patterns of change that have occurred in very different cultures. He notes a cyclical similarity, for example, in Greek, Gothic, and Renaissance art, in which a phase of equilibrium (usually described as

classic) is preceded by a more formal phase and followed by a freer period. These recurring cycles transcend historical forces and reflect the artists' attempts to refine the solutions of their predecessors. Changes are a product of the tensions in the society experienced by the artist—the tensions between the stability and security of established schemes and the desire to create something unique and different. There is a tension between "the reproduction of existing forms and the invention of new ones, by necessity, not by choice" (1962/1967, p. 228). The unique balance of the forces for stability and for change in each culture results in differential rates of change. Despite the reservations expressed by Ackerman, Gombrich, Schapiro, and others, it is still possible that there could be a logical and natural progression in cultural development in which the pattern of change of style is not determined by any preordained destiny, nor by a common goal, but by a hierarchical succession of complex decisions, each made in response to prior solutions and statements.

Kleinbauer (1971, p. 33) expresses some concern that attempts to relate the visual arts to theories of development and progress are attempts "to make art history a science, to create an objective and systematic investigation of the arts." Kleinbauer is critical of Hans Sedlymayr's configurational analysis of the 1930s as an attempt to discuss art history in terms of the methods of science, such as the creation of a qualitative and historical taxonomy, and the analysis of the principles of structural composition. Some art historians consider structural principles and the methods of natural science as inapplicable to art historical inquiry because they empty art of its aesthetic significance and integrity. But the definition of principles of structural organization is necessary if art historians are to verify formal relations among underlying principles in works of art. Despite his reservations, Kleinbauer (1971) believes that there may be some value in the application of the methods of natural science to the identification and explanation of major structural characteristics and underlying compositional principles in works of art.

Though a number of art historians express concern that a search for a developmental progression of structural principles over large epochs detracts from the appreciation of the creative act within its cultural context, it is possible that the understanding of structural change over the history of art may, in fact, lead to an increased sensitivity to facets of particular changes in style. Although artists in a particular epoch struggle to establish changes in style as alternate

solutions to the problems posed by their predecessors and are unaware of the future direction of art, this does not preclude the possibility that their revisions follow a logical and natural order, characterized by increasing differentiation, integration, complexity, and abstraction. Changes in style as steps away from prior solutions are not necessarily inconsistent with a natural developmental continuum in which the stages of solution, while distinct, are still interrelated, progressive, and hierarchical. Contextual forces within a society can lead to stability, rigidity, flexibility, or chaos (Peckham, 1965). Certain periods in history provided the social freedom necessary for remarkable changes in style, others demanded stability instead of change, and the social upheaval of still other periods fostered temporary setbacks and declines. Sensitivity to the fine balance between the forces for stability and for change within a culture enables the creative artist to capture the moment and to contribute to constructive change and the development of artistic style. Artistic style is the vector that results from complex and conflicting cultural pressures. Cultural values and technological skills determine the potential range of artistic expression; individual artists explore the options available within the range of an artistic style (Gay, 1974).

THE SEARCH FOR A "VOCABULARY OF FORM" OR A "SYSTEM OF SCHEMATA"

Despite the reluctance of some art critics and historians to consider a developmental progression in the history of art, there has been increasing call for a definition of a "vocabulary of form" or a "system of schemata" (Gombrich, 1960) that can provide a matrix through which changes in the modes of representation can be evaluated systematically. Most art historians stress the need to assess the formal, syntactical, or symbolic dimensions, and the structural principles of form and schemata through which elements are organized into a composition. The analysis of the formal or structural principles involved in the representation of the form of objects and of space would be independent of judgments of aesthetic value and merit (Bell, 1913; Fry, 1927). These formal or structural dimensions are central to most concepts of style. For example, Gombrich (1960, p. 87) stresses the need to understand the "system of schemata" used to represent the

visual world and Ackerman (1960) considers the vocabulary of formal and symbolic elements, and the syntax by which they are organized into a composition, as central concepts of style. Riegl (1901/1927) considered artistic development as a single continuous process in which the transitions of major epochs are forged in the creation of new forms to solve specific problems (Schapiro, 1953). Riegl found that the definition of formal principles enabled him to appreciate each epoch and style in its own right, independent of aesthetic and value judgments, and to study the inevitable developmental progression in art. Riegl, Wölfflin, and Dvořák consider the history of art as the history of the development of the representation of space and the organization and composition of form. The definition of the form of objects and the integration, coherence, and harmony of pure form are essential dimensions in art (Fry, 1928).

One of the most articulate and extensive statements about the importance of the formal dimension in the study of style is the work of Henri Focillon (1934/1948). Focillon's work derives from Wölfflin's and Reigl's formulations of the autonomous development of form. For Focillon (1934/1948, p. 2) "a work of art is the measure of space" as matter, movement, and form. Form is the central modality of life, the essence of art is the "construction of space and matter." Form has an internal logic, meaning, and nature; the metamorphosis of form is endless—it is the essence of style. The formal dimension of style is comprised of elements (its vocabulary or semantics) and a system of relationships (its syntax). Forms have inherent rules that are determined by the nature of our mental apparatus. But for Focillon (p. 14) "style is not merely a state in the life of forms . . . it is a homogeneous, coherent, formal environment . . . [which] give(s) birth to . . . various types of social structure: styles of life, vocabularies, states of awareness." It is in the various conceptions of space that the art historian can observe the redefinition of form. The life of art is manifested in the metamorphosis and transformation of this central theme: the development of form. The development of history of forms, however, according to Focillon cannot be indicated by a "single ascending line" or constant, fixed, universal postulates, but rather by various new geometries.

The stress on the importance of form and the conception of space has persisted throughout art history and is a major emphasis in contemporary art historical analysis and criticism. Susan Sontag (1961,

p. 12), for example, states that, first and foremost, greater attention should be given to form in art. A descriptive vocabulary of form would serve to limit an "arrogance of interpretation" that occurs because of an "excessive stress on content" in the study of art.

While there are many elements that must be considered in the analysis of style, such as light, shading, color, and content, most art historians consider the analysis of form and of space a central dimension. The emphasis on the importance of the structural elements of form and space for the analysis of style has been a persistent theme for most art historians, but as noted by Kleinbauer (1971, p. 19), the complexity of 20th century art has made scholars acutely aware of the need to develop more subtle and refined analyses of a formal vocabulary. Read (1952) has stated this position most succinctly.

> I believe that among the agents or instruments of human evolution, art is supremely important. I believe that the aesthetic faculty has been the means of man's first acquiring, and then refining, consciousness. Form, the progressive organization of elements otherwise chaotic, is given in perception. It is present in all skills—skill is the instinct for form revealed in action. Beyond this physiological and instinctive level, any further progress in human evolution has always been dependent on a realization of formal values. (p. 13)

This emphasis upon the study of form is not only central to an analysis of changes in style in the history of art, but the development of spatial forms is a central dimension for understanding all of human cognitive activity. Throughout civilization the construction of concepts of space has been central to understanding nature. Thus, there must be a common structure to the artist's creation of spatial forms and the scientist's conceptualization of space. As discussed by Whyte (1951), there is a basic congruence in the expression of space and time in the various disciplines within the arts, the sciences, and the humanities.

The definition of a vocabulary of form can provide more precise specification of the relationships between various modifications and revisions of modes of representation. Considerable effort has been devoted to deriving a vocabulary of form from psychological theory and research including the study of the sequences through which children learn to draw, the nature of perceptual processes, and the development of cognitive schemata, mental representation, and symbol formation.

Psychological Criteria for a Vocabulary of Form

There are two major types of criteria for assessing changes in style. Some art historians utilize criteria essentially intrinsic to art, while others utilize criteria established in disciplines independent of art (e.g., theories of visual perception, child development). Kleinbauer (1971) discusses both these approaches to the study of style as "intrinsic analyses" because they study the work of art itself rather than the cultural-social context in which the art was produced. But within these intrinsic analyses, it is important to distinguish criteria inherent to art from concepts and constructs that have an independent validity. These latter types of criteria can be evaluated within their own domain as well as in the study of artistic style. Art historians whose formulations are primarily based on concepts internal to art itself include Schapiro, Ackerman, Wölfflin, Riegl, Dvořák and Hauser. Art historians who have used concepts external to art criteria based primarily on psychological theory and research include Gombrich (1960) and Arnheim (1954/1974) who use perceptual theory and research; Loewy (1900/1907), Britsch (1926), Schaefer-Simmern (1948), and Arnheim (1954/1974) who noted a correspondence between aspects of the history of art and the sequences through which a child learns to paint and draw; and most recently Burnham (1971), Edgerton (1975), and Gablik (1976) who, based on Panofsky's (1924/25) earlier formulations of perspective as symbolic form, have utilized the research and theory about the child's development of increasingly differentiated, articulated, and integrated modes of mental representation to analyze the development of artistic modes of representation in the history of art. Using the psychological research and theory of Jean Piaget and other developmental psychologists, Jack Burnham, Samuel Edgerton, and, especially, Suzi Gablik have stressed that the psychological theory of the development of mental representation, rather than a theory of perception, may have considerable value in the study of the history of art. The development of perception and representation is interrelated, but the development of representation (or symbol formation) is a more extensive process because it includes the development of perceptual processes. Formulations from a theory of mental representation will be compatible with formulations derived from a theory of perception, but will be more encompassing. Thus a theory of mental representation can provide a model to account for the development of perspective as well as more