

## CHARACTER AND THE ARTS AND DISCIPLINES<sup>1</sup>

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CHARACTER is in part natural and modified by natural causes; it is in part acquired and developed. What a person is depends on antecedent abilities, sensitivities, and inclinations, and on the circumstances and associations, customs, laws, and institutions which have influenced his life and growth. Acquired character becomes second nature at each point of development; and the beginning point of the delineation or the determination of character may be set at any stage: for particular purposes of analysis, it may be prenatal, or a turning point in early childhood, or one of the numerous ages taken to mark maturity, or the moment immediately proximate to the actions under consideration. Education in a broad sense includes all external influences on the formation of character. In a more restricted sense, it is limited to deliberate devices used to influence attitudes, impulses, and skills relative to values and according to norms set by social opinion, political ideology, technical fashion, and religious belief, or by partial heterogeneous mergings among them.

More than two thousand years ago, Theophrastus prefaced his work, *The Characters*, with the explanation that he had often wondered why, although all Greece had the same climate and all Greeks had the same kind of education, all Greeks did not have the same structure (*taxis*) of character traits (*tropos*). To satisfy that curiosity, he started to study human nature (*physis*) and to distinguish and compare kinds

of dispositions. From the beginning, the study of character has had a comparative and normative basis; and from the beginning, it has apparently been easier or more interesting to study frustrations, anxieties, and pretensions than to study achievements, sufficiencies, and virtues. Theophrastus planned to investigate good and bad dispositions, but his work as it has come to us analyzes thirty bad characters, and we have no evidence that he had extended his investigation to good characters. The aspects of character which have presented themselves for study are well identified by the words chosen to designate them. "Character" means the impress or stamp, borrowed from the minting of coins, by which types are differentiated and classified. "Ethos" refers to the structure of feelings, motives, and conceptualizations by which actions are caused and to which responsibility for their effects is imputed. "Tropism" has acquired a primarily biological meaning, but "tropos" also meant the turn of character formed by the influence of common opinion and received values in a community. "Person" is probably derived from drama and from the mask of the actor, since in life, as on the stage, characters are perceived or imaged in presentation to viewers and audiences.

There have been as many conceptions of education as there have been theories of character. The adjustments of personality theory to learning theory are confused and puzzling unless the two sets of theories are ordered by relating comparable and concordant con-

cepts. When the aspects of character under consideration are conceived as natural, education may be viewed as therapy to remove alienations which impede natural functioning and to produce insight into one's nature and the causes of deviation from natural processes and needs. When the aspects of character under consideration are conceived as ethical, education may be viewed as the inculcation of moral and intellectual virtues suited to the circumstances and potentialities of the individual and productive of powers of adaptation, self-realization, and autonomy. When the aspects of character under consideration are conceived as social, education may be viewed as the adjustment of the individual to what is acceptable to the society or communities in which he lives and as one of the means used by communities to preserve and strengthen their values and to train members to perform the functions essential to their continuation and to their resistance to external dangers. When the aspects of character under consideration are considered as roles assumed or as parts in a game, or when roles or "natures" are conceived as the means by which we become a functioning constituent in a transacting group, education may be viewed as the acquisition of powers to win the equivalent of a game or a controversy or to be accepted in the role we play by knowledge of the rules or stage directions which govern it and by understanding of the opinions, motives, and devices of opponents, competitors, and fellow actors.

Investigation of the problems of the relation of education to character does not depend on determining whether character is essentially or primarily natural, moral, social, or dramatic. Character has all these aspects, and each of

them may be made basic in a theory of personality or of education which takes into account as secondary factors or problems the aspects made primary in other theories. The two basic problems are problems of means and of sequence: problems of means are problems of character and learning, that is, the determination of character by actions and the determination of actions by character; problems of sequence are problems of form and matter, that is, the succession of arts and disciplines used in education and acquired from education and the succession of potentialities, problems, and situations for which they are needed and on which they are used. There are problems of means in the interplay of character and action which relate the causes which produce character to the actions by which abilities and actions are judged at each stage of education, and there are problems of sequence in education and in the development of character which relate competences and skills-in-action to theories and norms at each transition from stage to stage. Problems of sequence arise from the need to determine what disciplines should be imparted early because (a) they are accessible to and usable by the many, and (b) they might serve as matter for later disciplines requisite to the few who continue in disciplinary education. Both problems must be faced and treated in any theory of character. The language and the distinctions proper to moral character will be used in the following analysis because they are well adapted to the problems faced in "liberal education" and "higher education." The results of the analysis should be subject to restatement to adapt them to character considered as natural, as social, and as dramatic and sportive. The lines of inquiry of the dif-

ferent theories lead to results which may be considered as supplementary and mutually reinforcing rather than contradictory and mutually exclusive.

Liberal education or education in the liberal arts was thought to be humane as well as liberating, to advance humanity as well as to secure freedom. The Romans applied the term "*humanitas*" to the cycle of learning or sequence of the arts and sought the meaning of humanity in the achievements of great artists. The liberal arts were enumerated as prerequisites to higher education in law, architecture, and natural history. With the coming of Christianity, the liberal arts were transformed into the three arts of words, or the *trivium*, and the four mathematical arts of things, or the *quadrivium*; and, when the first medieval universities were established, higher education was in law, medicine, and theology. The transition from medieval to modern education in the Renaissance can be described as a transformation to arts and disciplines adapted to the matters on which they are employed, rather than defined by the forms of thought and statement required for their acquisition and use. In the Middle Ages, the disciplines were arts or skills applied to any subject matter. All seven liberal arts might be employed in interpreting a text, sacred or human, or in analyzing a political problem, in the City of God or in terrestrial cities. The disciplines of the late Middle Ages were criticized as verbal and abstract, and new disciplines were established adapted to the subject matters of literature, history, and the sciences. Devices were borrowed from the old disciplines, particularly from rhetoric, and put to new uses on the concrete facts of history, the humanities, and the sciences. Mathematics ceased

to be the arts of things and became an inclusive science in the Cartesian universal mathematics, or a physical science in the Newtonian universal mechanics, or a special science with applications in other sciences; and philosophy ceased to be the art of arts and the science of sciences to become a special science by adaptation of methods from the other sciences. Disciplines, as fields, were multiplied in the quarrel of the ancients and the moderns, which affected both the humanities and the sciences, and in the specialization which separated the literatures of different languages and cultures and the fields of different sciences in which scientific methods were applied to different natural processes. The humanities were sharply separated from the sciences in this specialization: the humanities studied values by making them facts descriptive of different times and cultures, and the sciences investigated facts by making scientific methods and scientific explanations value-free. The social sciences used scientific methods to investigate values as national wealth, social customs, psychological preferences, and human modes of living and association. Higher education continued to be in law, medicine, and theology until teacher training, engineering, business, agriculture, nursing, social service, and library training were added to the professional schools, and the graduate schools extended education in the humanities, the natural sciences, and the social sciences and adapted the professionalism of older higher education to the proliferating specialization of the new fields.

We have thought of the modern problems of civilization, character, and education as problems of fragmentation which has destroyed communication

among people of different cultures, different occupations, and different educational formations. We have sought the remedy in interdisciplinary co-operation in research and teaching. Interdisciplinary research is the co-operation of experts from different fields in the investigation of common problems. Interdisciplinary education has, in the twentieth century, taken the form of general education to relate the disciplines; of courses in crucial issues—international, national, and local—to relate the disciplines to the problems, policies, and ideologies of our times; and of courses in other cultures than our own to relate the different traditions of arts, attitudes, and values. The relations established among the disciplines are relations among fields treated rather than among arts used. It is only by accident that the student in general education acquires the arts by which to perceive and appreciate the values achieved in the natural sciences, the social sciences, and the humanities or the arts by which to relate them to each other; crucial issues are usually approached by means of arts to secure agreement on a proposed resolution rather than by arts to arrive at and judge a solution; and area courses teach the language and customs of a particular culture and not the arts by which different cultures approach common problems. We have made professional schools interdisciplinary by introducing courses in the humanities and social sciences in engineering schools; courses in the social sciences and psychology in law schools; courses in psychology and religion in medical schools; and courses in social service, psychology, and pedagogy in theological seminaries. The press of specialization in graduate schools gives selected interdisciplinary work a status of specialization in research.

Interdisciplinary education and research cannot be achieved simply by juxtaposing, adding, or uniting disciplines conceived as fields or by elevating one of the fields to the office of queen of the sciences to produce knowledge conceived as unified information concerning the facts and analyses of different kinds of data and experiences. We need new disciplines to identify and transmit the arts by which men act and integrate their purposes and knowledge. Such disciplines can be formed by relating them to a new conception of character as a product and source of responsibility and autonomy rather than as an image and object of common approbations and private interests. The problems of means are problems of the adjustment of education to character. All men do not have the same natural abilities. At each stage of education, natural abilities are developed by practice and are diversified in new acquired skills; and skills, in turn, are generalized and directed by insight concerning causes and objectives which is acquired in the formation of arts. A man of great natural ability may need little practice and no conscious art, but the geniuses of thought and action furnish the examples for the development, in education, of exercises to produce like abilities and of analyses to produce like deliberate awareness of possibilities and of ways they may be utilized. The problems of sequence are problems of the adjustment of character to education. Experience is the product of repeated sensations and feelings, and skills in making and virtues in doing are habituations formed by experiences; the man of virtue and skill may act and produce without intellectual awareness of the rule of reason or the norms of value which are subject to examination and formulation by prudence and art; and the rational-

ity and purposiveness of prudence and art have foundations in scientific knowledge and moral and aesthetic values which need not be mastered by the man of art or prudence.

The relation between reason and action is ambiguous and generates a series of basic philosophic distinctions which have dogged education even in its least philosophical modes and phases—distinctions of thoughts or statements or actions and things (what is believed or said to be the case and what in fact is the case, what is undertaken and what is done, what is conceived and what is known, what is asserted and what is meant, what causes action and what is sought in action), and distinctions of fact and value (what is and what ought to be, what is known and what is decided, what is approved and what is done). The same ambiguities are present in “right action” and “rational action.” An action is right if it is well adapted to the circumstances, resources, needs, and purposes of the agent, that is, if it is well done; an action is right if it improves the circumstances, realizes the potentialities of available materials, orders needs, and develops the abilities and interests of the agent, that is, if the end achieved is good. All actions, even erratic and neurotic actions, are reasonable, since they have discoverable causes of which the agent is frequently explicitly conscious. An action is rational when it is well adjusted to the character of a person and his purposes under the circumstances; an action is rational when the reasons for the action and the values achieved by it have been examined and judged. Good skills and good habits may be badly used, but they have the rightness and rationality of actions well performed; and such actions are put to good uses when they conform to rules of reason and norms of

rightness which need not be reviewed in each action or by each agent. Education for character is the formation of moral virtues and technical skills adapted to the rational and the right by prudence and art; it is also the formation of intellectual virtues to relate what passes for prudence and art to values and reality and to judge and justify their pertinence to what is the case and to what is desirable. The first treats problems of means which must be faced at all stages of education. The second treats problems of sequence in which general education to produce the virtues and skills needed by all men is distinguished from higher education to produce some men competent to apply science and wisdom to the judgment of what is accepted as true and valuable.

Arts and disciplines were at various times in the past closely related to the formation of character and to the judgment of character by virtues and abilities. We have made some advances in the formation of new disciplines to serve that purpose today, but the change is impeded by conceptions of character and of arts and disciplines which make it difficult to relate problems of personality to problems of learning. Experiments in general education have been based on a conception of the liberal arts which we have inherited from the Renaissance, when the term “fine arts” or “*beaux arts*” was used to differentiate the subject matter of the humanities and when the study of literatures was provided with systematic methods in the “*ars critica*.” The development of the natural sciences made liberal arts colleges schools of arts and sciences. Much of what passes for general education merely brings together fragments of the fields of the humanities, the physical sciences, the biological sciences, and the social sciences, and it

preserves the distinction of science and art in a stultifying separation of knowledge of facts and knowledge of values. Some remnants of the medieval liberal arts are occasionally used to isolate the arts employed to unify each of the fragments and to relate them to each other, but they also serve to perpetuate the medieval distinction between the arts of words and the arts of things.

The arts which are used most effectively in examining contemporary problems and in making decisions about them are those which relate facts and values, words and things. The formation of disciplines to train men in those arts is hampered by two diremptions in our customary use of disciplines as fields and disciplines as arts. We continue to make the distinction between intellectual judgments and aesthetic judgments a sharp separation: the statement of facts depends on a cognitive use of language; the statement of values involves an emotive use. We continue to make the distinction between laws and facts, lawlike statements and factual descriptions, into a like separation of disparate realms: words have connotations and meanings as well as denotations and references, and universal statements are judged by examining the words or symbols in which they are expressed (frequently making their certainty the expression of a tautology), while particular statements are judged by their empirical warrant. We must forget the radical separation of verbalisms and pragmatisms in the Roman arts, which were continued in the separate spiritual verbalisms and pragmatisms of the medieval arts, in order to penetrate to the relations of words and things; and we must abandon the similar segregations of humanisms and scientisms in the Renaissance arts, in order to perceive

and appreciate facts and values. The recognition of the most particular and least disputable fact depends on generalizations of experience and knowledge which make it possible for us to perceive and judge it as a fact; the most abstract and formal statement or symbolic arrangement has a factual character and derivation which makes it possible for us to appreciate it as a concrete structure and interpret it in possible definite meanings and particular applications. What is, is not what ought to be, but any selection and statement of what is depends on value judgments concerning it as it is and contains indications of what it may become; and any recognition of values in preference and appreciation depends on facts of subject and object—on facts of taste and judgment and on facts about what is or about the possibility of changing it.

The new disciplines should be arts by which acceptance or statement of facts is related to the structures of thought and statement by which they are known or discovered, and by which perception or judgment of values is related to actualities in which they inhere or to possibilities by which they may be made actual. Some indication of their character can be derived by considering them as connections between disciplines considered as fields and as extensions of disciplines considered as arts. If the arts of facts and values, of words and things, are combined in interdisciplinary assimilation of what have traditionally been distinct fields and distinct arts, four arts may be distinguished.

General education should include the art of interpreting facts and statements. Known facts are recorded facts, and facts are recorded in all the disciplines. The art of recovering and interpreting known facts extends to the facts re-

corded in history, presented in literature, and established in science and, from them, to the facts encountered in experience and interpreted in the light of known historical, artistic, or scientific facts. The structure and meaning of facts are the structure and meaning of truth. To be able to explore what is known is to be able to appreciate and judge tradition and to use it in knowledge, action, and aesthetic judgment. Changing applications of factual statements and changing meanings of true statements transform statements and facts into questions and problems. The interpretation of fiction and drama depends on facts and raises questions: interpretation of facts about *Hamlet* makes possible the appreciation of a play and raises questions that extend to other forms of aesthetic appreciation and to practical and theoretic inquiry; the facts which an audience recovers with Oedipus while following the plot of a tragedy raise questions which psychology examines with respect to all men; the device of the wooden horse and the adventures of Don Quixote raise questions of aesthetics, political strategy, and social and individual morality. In like fashion, the interpretation of men and peoples discloses facts and raises questions about the nature and interaction of individuals and society, human consensus and natural law; and the interpretation of things and processes discloses facts and raises questions about parts and kinds, actions and reactions. The structure of facts is a structure of consistency and coherence; even random occurrences have an order of probability, and the surprises of a hazardous world are consequences of the expectations of an orderly world.

The study of known facts should yield insight into a rich diversity of

facts and into the congruences and homogeneities of their multiplex interrelations. It is an art of interpretation and recovery not unrelated to what the art of grammar was when it was the art of interpreting texts and uncovering the meanings and values they express. The new liberal art is a study of *questions* raised in the interpretation not only of literary texts and scriptures but also of scientific texts, of statements of policy, law, and custom, and of historical records, and in the interpretation of the facts stated and meant as well as the significances of language and the connections of thought. It is acquired by practice of an art of recovering facts in experience as well as of an art of seeing the import of statements in narratives, expositions, or arguments. Its subject matter is any factual statement or stated fact. It is the art of *recovery*.

The art of knowing and interpreting facts and statements should be supplemented by an art of discovery and invention. The study of known facts remains within the bounded region of what men have accomplished. Intimations of the existence and influence of unknown facts beyond the frontiers of knowledge are conveyed by problems and incoherences encountered in accepted facts and accepted modes of procedure. Interest in creativity has recently led to experiments in the arts of discovery and invention in education. Like the art of understanding and interpreting facts already attested, the art of discovering and creating new facts depends on constituting structures by means of which facts in turn are constituted. The structure of interpretation is a structure of coherent meanings and consistent facts in which lines of implication and sequence may be detected or constructed; the structure

of invention is an interpreted structure in which incoherences and contradictions indicate the need for new facts or for reinterpretation of unquestioned meanings and undoubted facts. Facts and statements have internal as well as external structures, and new facts are constituted by modifying the elements of old facts or by introducing new elements in combination with familiar elements. The elements of facts and statements are terms and concepts. Basic ideas have undergone a long history of change in each of the disciplines considered as fields, and many of them have moved from one discipline to another, adapting old meanings to new applications in which they get new meanings. Motion, matter, and infinity, organism, function, and life, constitution, law, and freedom, beauty, imagination, and expression have changed their meanings again and again in innovations and discoveries. Reconstituted as new elements, they have also contributed to innovations by making perception of new facts possible and communication about them intelligible.

The study of the elements of facts should yield insight into the nature of unknown facts and provide practice in the arts by which they are investigated and made known. It is an art of selection and discovery not unrelated to what rhetoric was when it included a basic art expounded in treatises called "*De Inventione*." Concepts and terms have fixed meanings. Changing meanings transform concepts and terms into "places" or "topics." Ancient rhetoric used "common places" as "seats of invention or discovery"; Francis Bacon reoriented "places" from search for forms of statement to inquiry into matters stated: He criticized "common places" which yield words and argu-

ments and used "proper places" for the discovery of things and arts and for the advancement of knowledge. The new liberal art is a study of *topics* or places which lead to innovations in each of the disciplines as subject matters and in the common matters which make possible the transition of concepts and terms from discipline to discipline; it is acquired by practice of arts of discovery which uncover new facts by the heterogeneous combination of concepts and terms. Its subject matter is any term which is ambiguous or subject to dispute in a statement of fact. It is the art of *discovery*.

The arts of known facts and of unknown facts make use of structures. It is impossible to state or recover a fact in isolation from other statements or facts, and it is impossible to invent or select a concept, term, or element without presenting it as a constituent part of a statement or a fact. The art of recognizing and of making structures is the art of using connections for action, art, and inquiry. There are sequences and consequences in each of the disciplines considered as fields, and there are sequences and consequences which relate fields to each other. Consequences and sequences have literal and fixed orders in any particular statement or concrete application of them, but the orders they state or establish are *themes* which take on fixed meanings adapted to the facts stated and ordered. The innumerable plots and heroes of drama and fiction are variations on a finite number of themes of human action and suffering; the innumerable associations formed by men and the innumerable men determined by actions and associations are variations on a finite number of themes explored in theories of the relation of individual and society; and



the innumerable motions initiated, transmitted, and altered are variations on a finite number of themes of matter and motion elaborated in inquiries into laws of motion. The sequences and consequences examined by any of the disciplines as arts may be found in any field; and any document—a poem, a judicial decision, or a scientific treatise—may be read as an instance of connections revealed by literary, social, or scientific methods.

The study of connections should yield insight into sequences of thought, action, and process, and practice in the arts by which they are used in thinking, doing, and making. It is an art of method and presentation not unrelated to what was once called the art of discourse, *ars disserendi*. It is a new liberal art when it is applied to *themes* to relate different discourses—*discursus* or “runnings about”—in words, in thoughts, and in things to each other by examining their formulation in poetical, rhetorical, and logical sequences. Its subject matter is any sequential or compendent whole ordered by methods of arranging, doing, inquiring, or knowing. It is the art of *presentation*.

The art of forming structures is ordered not only to facts and to the arts used to interpret and discover facts but also to principles and to the arts used to give structures objective foundations and ideal values. Action, art, and knowledge are organized according to principles, as are the parts and processes of any encompassing and organic whole. The system of any discipline orders the subsystems proper to the field, and it may be used to organize other disciplines considered as fields and to orient other disciplines considered as arts. The art of judging and establishing the authority or warrant from which con-

sequences are traced and on which their validity and value depend is an art of relating sequences of thought, statements, and things by connections of ideas, words, and facts disclosed and tested in narrative and exposition or in inquiry and proof. It is the art of finding principles in reality and in values for methodologized orderings of recovered and discovered facts. Warranty is never absolute; it is a structure of structures. In antiquity, metaphysics was called an “architectonic science” because it treated and established the principles of all sciences, theoretic, practical, and productive. Politics was a like architectonic science because the institutions and customs of states determine the activities and the permissible modes and available materials of activity to be pursued by its members, including activities in the arts and sciences. Poetics, or the science of production, was likewise an architectonic science because sciences and social and political institutions, like art objects and instruments of production, are products of arts. Principles are used reflexively on each other and are transformed from principles to consequences by changing the science used as architectonic: The philosophy of science examines the organization of the sciences, including psychology and sociology; psychology accounts for attitudes and doctrines, including those of philosophers and sociologists; the sociology of knowledge sets forth the structures of experience and expectation which determine beliefs and conclusions, including those of philosophy and psychology.

The study of systems and of transformations of systems of knowledge, action, and art should yield insight into the nature and uses of principles and into the art of establishing principles,

combining them into fruitful sets, transforming them under the influence of other principles, and detecting and stating them as *causes*, *consensus*, and *paradoxes*. It is the art by which interdisciplinary connections are established among the disciplines considered as subject matters and the art by which hierarchical connections are established among the disciplines considered as arts. It is an art of principles and systematization not unrelated to the arts of analytics, dialectics, and sophistics. It is a new liberal art when its subject matter is extended to all-inclusive organizations of things, actions, and knowledge and to the principles on which they are established. It is the art of *systematization*.

The problems of means are the same at all stages of education. Higher education, like any other stage of education, should be liberal education, and it should affect character by inculcating arts of recovery, discovery, presentation, and systematization appropriate to the abilities and interests of the person and his prior formation and education. Problems of sequence distinguish higher education from general education. General education is a prerequisite to higher education in the sense that the arts acquired in general education are used in the more determinate fields and specialized arts of higher education. Higher education is the basis of general education in the sense that the arts of general education and the selections of elements, the interpretations of facts, the methods of connections, and the systematizations of principles are derived from the arts and from the fields of the specialized disciplines of higher education. The problems of education for character in higher education are different from

those of general education. Nonetheless, many of the problems of the relation of the arts of general education to the formation of character result from unsolved problems of higher education.

General education should produce some acquaintance with and interest in all arts and subject matters to relate all men in diversified communities and to differentiate men by giving each man an integrated individual character. The arts and disciplines of general education, to be effective, must have objectivity and purposiveness. The grounds and ends of general education in secondary schools, colleges, and adult education are determined and justified by higher education which uncovers and establishes accepted principles of reality and value and produces the exemplars and teachers of general education. Reality and values tend to be separated from each other and to be assigned to narrow, mutually exclusive fields and to special unrelated arts in higher education. The tendency in general education to repair the dichotomy of words and things by treating facts in structures and to deny the dichotomy of facts and values by treating possibilities in actualities is hindered by the separation of problems of character and learning in higher education. If higher education is designed to develop competence in particular fields, even if the fields of scientific inquiry and those of moral and aesthetic judgment are conceived to be distinct, competence in every profession and in each field of science, social science, and the humanities is made to consist in mastery of the facts and of the methods of treating the problems of the field; the problems of attitude and purpose, taste and morality, feeling and will, adjustment and autonomy are separated from the problems of cogni-

tion and objective knowledge. Education then is thought to have become primarily intellectual and in need of reform to provide interest and motivation and to take into account the whole man, and the rational processes developed in such education have no direct relation to action or appreciation, responsibility or taste.

Yet the relation of education to character is clearer in higher education than in general education. In general education, comprehensive arts and inclusive disciplines are acquired for the formation of individual character. In higher education, specialized arts and competence in particular fields are inseparable from character traits essential to mastery of the arts and use of the competences employed in them. The specialized arts and disciplines of higher education are not defined solely by the subject matters on which they are employed: they are arts and disciplines only if they arouse interest and purpose, judgment and insight. They are a development of the self in relation to others by means of knowledge adapted to circumstances. Higher education develops kinds of character adapted to disciplines considered as fields and formed by disciplines considered as arts. They are subject, like other species or kinds, to generic descriptions which are particularized by application to particular matters and by specification in particular functions. Acquisition of the art of recovery in a particular field produces a receptive man, sensitive to known facts and consistencies and conservative with established knowledge and values; acquisition of the art of discovery produces a curious man, resistant to the pressures of acceptance and conformity and tolerant of incongruities and inconsistencies which open

up possibilities of spontaneous self-initiation and innovation; acquisition of the art of presentation produces an open-minded man, imaginative in perceiving and forming connections; acquisition of the art of systematization produces a purposive man, reflective concerning possible orders of knowledge, action, and judgment and concerning the transformations of organizing principles and of the hierarchies of their systematic consequences. Higher education should form men who have acquired all these arts and unite them in an integrated character which is dynamic and self-assured in applying these arts within a special field and in extending them to relate knowledge and progress in that field to other men and their formation and to other problems and their resolution. The arts relative to character are disciplines formative of character. They are distinct from the arts of science when the latter are limited to applying laws and law-like statements to processes and occurrences; and they are distinct from the arts of semantics when the latter are limited to analyzing the meanings and applications of words. The arts of character are oriented to the intentions and purposes, problems and aspirations, of individual men: They are skeptical and resistant—as well as responsive—to established facts and new facts and are perceptive and productive of actual values and possible values.

Disciplined sensitivity is an acquired art which transforms undifferentiated immediate experience into awareness of certifiable and interpretable facts. Competence in any field depends on mastery of the relevant facts, but knowledge acquired as factual information tends to make facts fixed, hard, and irresistible and to make interpretations frozen

presentations of facts as pertinent or irrelevant or fictive. Facts are not encountered ready-made in experience. They are made, as their name implies, and their making depends on structures of knowledge, action, and art from which they derive their being and interpretation. Facts are discredited or made credible by changes in the structures in which they are perceived and stated. It is easy to show that an alleged fact is imaginary or fictive by interpreting it in a structure of coherence different from the one in which it is stated. Discredited facts are either abandoned or reinterpreted. It is easy to extend a structure of interpreted facts to more like facts. Accredited facts are either static tabulations or dynamic steps to new interpretations in which the initial facts are modified or discredited. The most successful interdisciplinary research and teaching are based on relating the facts of one discipline to the facts of other disciplines. Interdisciplinary juxtaposition of fields needs to be supplemented by more attention to the art of interpretation by which those relations are established and given meaning.

The development of sensitivity in higher education in the professions and in the arts and sciences depends on breaking the tyranny of fixed accepted facts reified as independent entities. There is a vast multiplicity of facts in any field and a vast number of interpretations of them as facts. To know more facts is to practice the art of interpretation more broadly. It is to raise questions of fact and interpretation. The coherent facts of a discipline are not a catechism of truths to be learned and repeated: they are products of a structure of tried hypotheses which open up factual relations in the context

of other structures which yield facts which at first seem irrelevant or dubious. The art of interpretation is used to make some irrelevant facts relevant and some dubious facts divergent aspects of relevant facts. Disciplined sensitivity is acquired by knowledge of more facts and use of more interpretations. It extends without need of extraneous disciplines from the problems of a particular field to the problems of communities and other people and to their facts and sensitivities.

Disciplined originality is an acquired art which abandons or modifies accepted certainties and interpretations when they become involved in inconsistencies and present problems. Contradictions may be removed by reinterpreting the facts, or they may be removed by abandoning them and re-examining the structure of concepts by which they are constituted facts. Every discipline has its basic categories which are employed without question and which seem to be fixed in the nature of the subject matter and to be so immediately discernible that departures from them are recognized to be category mistakes detected and corrected by inspection and intuition. Categories are multiplied into the numerous elementary terms and concepts which take their place when the priority of a finite set of categories is challenged. They yield to topics or places in the art of invention when the interpretation of inconsistencies in facts suggests the need for new facts and for the invention of new categories to constitute them. The discoveries which laid the foundations of modern mechanics depended on the transformation of concepts and categories. "Motion," together with "rest," are categories in Plato's analysis of being and becoming; "motion" is a

basic concept and a subject matter in Aristotle's physics, defined in terms of matter, form, and privation and classified into kinds by use of the categories of substance, quality, quantity, and place; the inconsistencies and problems found in the Aristotelian concept of motion by Greek commentators in the third to sixth centuries, by Latin commentators in the fourteenth century, and by Galileo in the seventeenth century led to discussion not of a single concept but of a "topic" which made transition possible from concept to concept; Galileo limited his analysis to local motion which he defined in terms of time and space; similar topics made possible transitions in concepts from weight, to mass, to matter, and from power, to force, to energy. The structures of defined elements of facts and statements are themselves facts ordered coherently and consistently; undefined elements provide the continuity among changing facts and concepts, and their efficacy for innovation derives from their inconsistency and incongruity with established structures and expectations. The art of invention is used to discover new facts by selecting new elements or newly defined elements from which to construct them. Disciplined originality is acquired by knowledge of topics which are the source of new elements and new concepts in a given field and by practice in the art of selection which makes possible the combination of elements in new meaningful facts and interpretations. Originality acquired in creative selection in a particular field emphasizes the intellectual aspect of character traits adapted to creative innovations in the contradictions of practical action and the inconsistencies of cultural values.

Disciplined coherency is an acquired

art to follow or establish connections of things or of discourse. It explores and creates the structures within which disciplined sensitivity detects and interprets facts. Facts are encountered in sequences of occurrences and are understood and stated in consequences of thought and discourse. Disciplined sensitivity is an ability to interpret and present; disciplined coherency is an ability to trace paths across structures of fact and to relate presentations methodically. It is not limited to the ability to recognize the adequacy and validity of a particular sequence or account or proof; it includes the imaginative ability to place presentations in different sequences and to recognize the "themes" which are set forth in different accounts as different connections of the same or different facts. "Freedom," thus, is employed in the acquisition of knowledge, the performance of actions, and the creation of art; it is a fact of knowing, willing, and feeling; it is analyzed in relation to the nature of man, knowledge of the good, the use of power, and deliberative choice. Disciplined coherency is used to trace the consequences of any thesis in narrative, description, inquiry, and proof; it is used to move from thesis to thesis and from method to method by treating different accounts as variations of a theme. Disciplined sensitivity answers questions by recognizing facts; disciplined coherency elaborates themes to account for facts by connections or reasons among facts. The art of presentation is used to set forth and analyze sequences and consequences. Disciplined coherency is acquired by knowledge of the themes which establish connections in a given field and by practice in the art of presentation which uses methods to establish theses by definition and hypothesis

and to build the variant connections which particularize a theme. Disciplined coherency acquired in treating the connections of a particular field makes use of methods which extend its technical themes to connections which involve other men and the problems of life and action.

Disciplined purposiveness is an acquired art to establish principles of order among the structures of interpretation, discovery, and presentation. It seeks criteria and norms for the accepted, the novel, and the connected, in principles which provide warrant of their objectivity and justification of their values. It is not an art limited to the subjective purposes of man, nor does it depend on hypostasizing purposes in a teleological universe. It does not make commitments to matter or mind, accident or design, since it is the art used in controversies about them. It is committed only to the conviction that the connections of subject matters can be stated accurately and adequately in connections of discourse and that the connections established by methodological inquiry and well-grounded proof can be tested by sequences of events observed or experimentally controlled. Disciplined purposiveness seeks the causes of the sequences traced by disciplined coherency, and it transforms the structure of known sequences by relating them to causes which condition the operation of their proper causes. We do not think, or act, or judge according to principles ordered in a strictly determined set. The principles according to which we proceed when our thoughts, actions, and judgments are orderly can be detected and stated, but disciplined purposiveness is needed to disclose the effect of other principles on the principles we explicitly acknowledge and the

transformations of principles which result when the diverse subject matters are "reduced" to that of one discipline in the organization of knowledge and when the arts of one discipline are used to hierarchize all arts in the sequential use of arts. The literal principles in particular fields are related to each other in paradoxes which state the principles of architectonic sciences. When the principles of the dynamics of point-particles were extended to other motions, they yielded the paradoxical principles of thermodynamics, of electrodynamics, and of the dynamics of the motion of light; and in further extension they yielded the paradoxical principles of relativity physics and quantum mechanics which order the motion, energy, and matter of the cosmos and of its least particles. The art of systematization is used to give ordered sequences of facts objective foundations and intelligible values. Disciplined purposiveness is acquired by knowledge of the paradoxes from which the principles of knowledge, action, and art are derived in a given field (which in turn are instances of the paradox that knowing, doing, and making may each be used as a principle to account for the others) and by practice of the art of systematization by which principles are related to each other by more inclusive principles from which they derive their application to things and their pertinence to ends. Disciplined purposiveness is adapted to the extension to any principle, and it is adapted to the principles of a particular discipline only by systematizing that discipline in other architectonic sciences.

Teaching for character in higher education does not depend on the addition of new arts and disciplines to those proper to higher education. It does de-

pend, however, on a fuller use of the arts of interpretation, discovery, presentation, and systematization and on an understanding of their bearing on the person who acquires them as well as their bearing on the subject matters on which they are practiced. The art of interpretation is concealed in the presentation of facts, and competent and comprehensive reporting of the state of knowledge in the field becomes a substitute for disciplined sensitivity. The tyranny of facts cuts short the interpretation of facts to preserve their definiteness as facts and limits the multiplication of facts to preserve their relevance and consistency. The art of discovery is denuded of structure, and assured or spontaneous departure from customary formulations becomes a substitute for disciplined originality. The tyranny of novelty cuts short patient analysis of topics and obscures the relevance of novelty in the statement of facts to the resolution of incongruities and inconsistencies encountered in facts. The art of presentation is limited to a fixed view of the connections in a subject matter and of the scientific, practical, or aesthetic method by which they are treated

in the discipline. The tyranny of precision cuts short exploration of themes and limits variation of methods in their treatment. The art of systematization is reduced to an art of explanation, and principles are seldom referred to except in a mathematical sense. The tyranny of randomness cuts short analysis of paradoxes and of the ordering principles they yield and limits systematic formulations and statements of the relations of disciplines to establishment of domains of inquiry and survey of their borders. If the arts practiced on subject matters were used in education in their bearing on character, the influence of arts and disciplines would be clear in the abilities acquired; and use of those abilities as arts on the subject matters taught would transform the contents of education and the problems and methods of the disciplines considered as fields. Since general education borrows its arts and disciplines from higher education, education for character in higher education would provide materials and methods for the improvement of general education, as well as for progress and revolution in the arts and sciences.

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#### NOTE

1. Read at the Seventeenth Conference on Science, Philosophy, and Religion, at Chicago, August 29, 1966.