

A los Asistentes a los cursos del Centro de Educación
Continua

La Facultad de Ingeniería, por conducto del Centro de Educación Continua, otorga constancia de asistencia a quienes cumplan con los requisitos establecidos para cada curso. Las personas que deseen que aparezca su título profesional precediendo a su nombre en el diploma, deberán entregar copia del mismo o de su cédula profesional a más tardar el Segundo Día de Clases, en las oficinas del Centro, con la Señora Sánchez, de lo contrario no será posible.

El control de asistencia se efectuará a través de la persona encargada de entregar notas, en la mesa de entrega de material, mediante listas especiales. Las ausencias serán computadas por las autoridades del Centro.

Se recomienda a los asistentes participar activamente con sus ideas y experiencias, pues los cursos que ofrece el Centro están planeados para que los profesores expongan una tesis, pero sobre todo para que coordinen las opiniones de todos los interesados constituyendo verdaderos seminarios.

Al finalizar el curso se hará una evaluación del mismo a través de un cuestionario diseñado para emitir juicios anónimos por parte de los asistentes. Las personas comisionadas por alguna institución deberán pasar a inscribirse en las oficinas del Centro en la misma forma que los demás asistentes.

Con objeto de mejorar los servicios que el Centro de Educación Continua ofrece, es importante que todos los asistentes llenen y entreguen su hoja de inscripción con los datos que se les solicitan al iniciarse el curso.

ATENTAMENTE

ING. JOSE ELISEO OCAMPO SAMANO
COORDINADOR DE CURSOS



Course Objectives

1. Develop an understanding of learning theory
2. Develop an understanding of adult education
3. Understand the problems of adults and how they differ from undergraduate and children
4. Learn a method of developing a correspondence course lesson and home assignment
5. Appreciate the organization and individuals necessary to conduct an effective Correspondence Course Program
6. Design a marketing strategy
7. Appreciate the costs of conducting a Correspondence Course Program
8. Understand evaluation mechanisms and need for evaluation

Workshop

P R A C T I C E

1. Establishing learning objectives
2. Establish a list of courses which appear to have need
3. Design a lesson
4. Establish an organization for the courses
5. Establish a marketing strategy
6. Price the courses
7. Select potential media to assist Correspondence Courses
8. Establish measures of evaluation

OUTLINE

Session

1. Learning Theory
2. The Learner
3. Background on Correspondence Courses
4. Need
5. Writing and Teaching Correspondence Courses
6. Organization for Correspondence Courses
7. Marketing
8. Evaluation
9. Media and Problems



JOHN P. KLUS, Chairman, Department of Engineering, University of Wisconsin--Extension, Madison, Wisconsin

Previous to his present position as Chairman of the Department of Engineering, University of Wisconsin--Extension, and a Professor of Civil Engineering, Dr. Klus has worked for the Corps of Engineers, spending a summer in Greenland; for the American Appraisal Company; and for the University of Wisconsin. During this time he completed work on his B.S. and M.S. degrees in Civil Engineering from Michigan Technological University. In 1965 he earned his Ph.D. degree from the University of Wisconsin and was appointed an Assistant Professor.

At Wisconsin he created the concept of the Professional Development Degree program in Engineering and has been instrumental in developing several other new educational programs.

He is a member of several professional societies and fraternities: American Society of Civil Engineers and Past President of the Madison Chapter, the National and the Wisconsin Society of Professional Engineers, American Association for the Advancement of Science, American Society for Engineering Education, and American Public Works Association. He is a registered Professional Engineer in the state of Wisconsin.

Recent honors accorded Dr. Klus are: the Dow Chemical Award, ASEE-North Midwest, 1969; Young Engineer of the Year, 1969, and Outstanding Engineer in Education Award, 1971, Southwest Chapter of WSPE; Professional Engineer in Education, Wisconsin Society of Professional Engineers; listing in "Who's Who in the Midwest"; Know Your Madisonian Award, 1971; UW-Extension Distinguished Service Award, 1971; NAEA-American College Testing Program Innovative New Program Award, 1972; Chairman, United Nations Policy Working Group, UNESCO meeting in Paris on Continuing Education of Engineers, June 1973.

He is a coauthor of an engineering review text, "Engineering Review--A Basic Review by Problem Sets", and has published a number of technical articles. During the academic year 1966-67, Dr. Klus was on university leave as a Fulbright Scholar for research and teaching in Finland. He lectures throughout the United States and several countries of Europe.





centro de educación continua
división de estudios superiores
facultad de ingeniería, unam



ENSEÑANZA POR CORRESPONDENCIA

JOHN P. KLUS.

Julio 1975





THE SPECIAL PERSPECTIVE OF THE ADULT

THERE: East of New Guinea, in the southern Pacific, lie the Trobriand Islands. The people who live there are great mariners, lively and active. But they take no interest in things changing. If a thing changes, then it becomes something else, and they call it something else.

HERE: Just as we do not introduce an old gentleman with a long white beard as, "the bouncing baby boy, Jim Jones."

JIM: (a very old man) Very pleased to make your acquaintance.

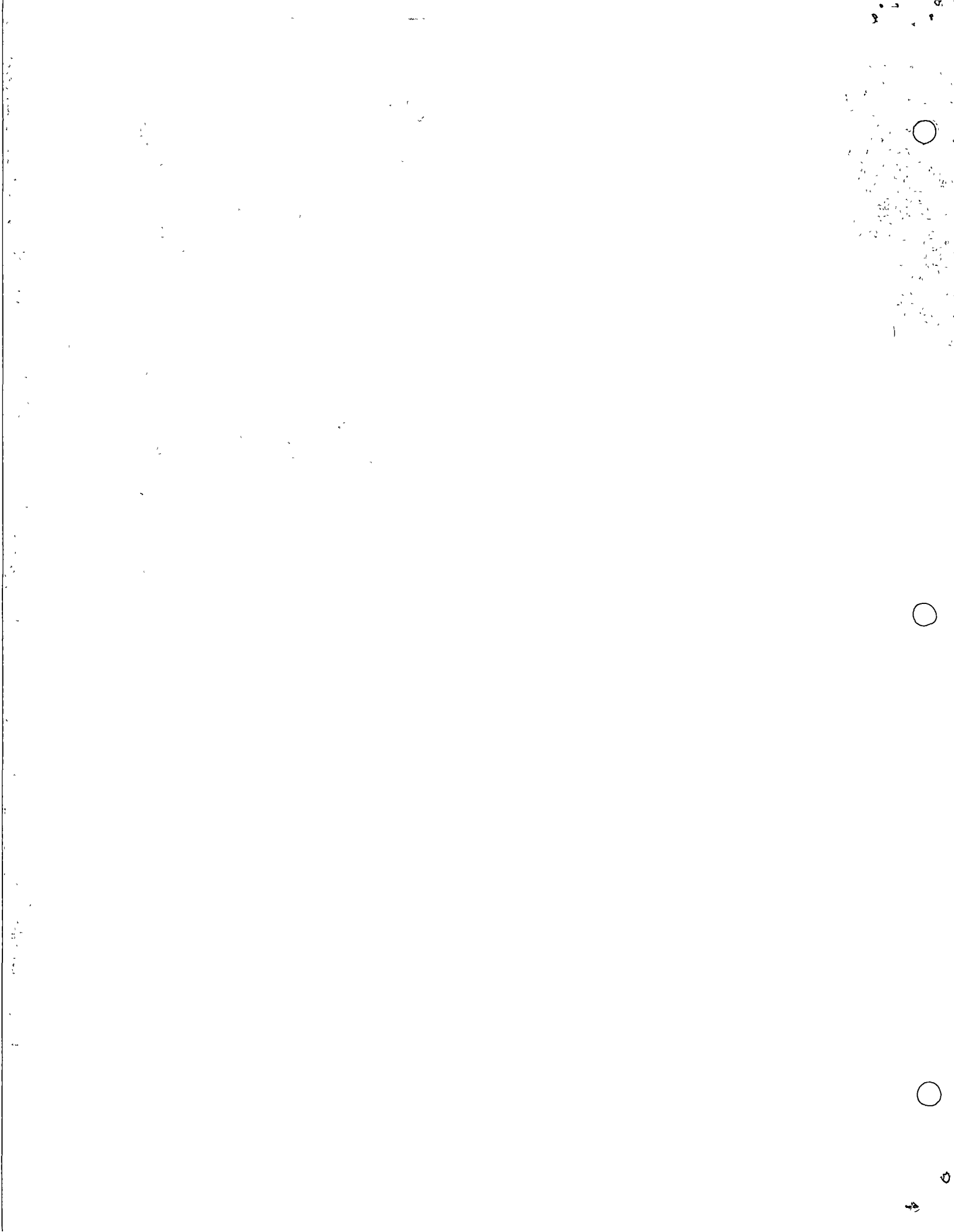
THERE: (confidentially, to **HERE**) Buster here isn't any more a bouncing baby boy than I am.

JIM: Ah, but you see, once upon a time I was, in the long, long ago.

HERE: (dismissing him briskly) But he isn't now. In fact, we don't think of him as a kind of modified infant, but as something else—an old gentleman, a different kind of animal.

LISTER SINCLAIR, *A Word in Your Ear*

The dilemma of adult education is precisely that when people think of education, their images are taken from their own memories and from the urgent need to induce the young to take on the responsibilities and burdens of adulthood and the behavior appropriate to that status. To the extent that the adult educator, at whatever level he oper-



ates and whatever his purposes, sees clearly the special problems of teaching the already adult as special, the more effective he is likely to be. The cynicism about teaching adults one finds among some university people, as well as the indignant, sentimental defensiveness once common in adult education itself, equally miss the educational point. There are considerable, and valid, differences between the enterprise devoted to the large and necessary task of socializing the young and that which pays attention to the learning needs of the world of adults: differences in purpose, scope, intensity, and available resources, and, consequently, wide differences in the appropriateness of the methods.

THE LEARNING PROCESS

The baby experiences the world, in the phrase of William James which psychologists never tire of quoting, as "a booming, buzzing confusion." His reaction to that world consists in the main of a glassy-eyed indifference to anything which does not immediately meet the demands of his stomach for food, his nervous system for warmth and stability, his psyche for love and attention. In the normal course of development he very soon begins by himself to sort the confusion into a series of recognizable "things," but it is up to his society to tell him what those things are for and what their values are. He must modify his monstrous egocentrism into forms of which the particular time approves and learn to give up his individual, often bizarre, ways of perceiving the world in favor of common agreements about what things mean. He must work out his adjustment to the boundaries of the particular life chance provided by his historical era, his social class and skin color, the local rules of the power game, and his own native fund of energy.

The educational methods of the public school system and the undergraduate college grow out of those tasks involved in becoming a social being, tasks which often grossly distort both the logical and psychological fabric of the learning task itself. These distortions are instructive for adult educators, since in the heat of getting our jobs done, we accept too often the methods with greatest currency as those with the highest intrinsic value.¹

The Child's Learning

In the early years of life, generally at least until the age of eleven, the child "sees" a world which is very different from the one

the adult perceives. By the time he goes to school, to be sure, he has reduced his booming confusion to a certain degree of orderliness. He knows a great deal about the important other people in his life and he can correctly name a large variety of objects and events he meets. But until he is almost ready to become an adolescent, his most important cognitive task is to see the world correctly, that is, realistically rather than magically.

Children, for example, tend to be unable to distinguish clearly distinct parts but to see things as part of a large, global situation. Early in life, when a child says "chair," he might be trying to communicate a variety of things: "I should like to be lifted," or "My chair isn't here," or any number of other meanings. The thing and the word itself stand for all the other meanings which have been at one time connected with it. This kind of confusion persists for longer than one might think. Piaget asked children between the ages of four and twelve what one thinks with, and whether one can see or touch "thought." Children under seven said that "we think with our mouths." "As for animals," said a little boy of six, "they think with their mouths, too, all except the horse, and he thinks with his ears, because he hears when you speak to him but he doesn't talk himself." In the later stage, adult influence is felt, and the child says that we think with our heads. "But under these words the child's conception remains spontaneous and in complete continuity with the answers of the first stage. We think with 'a little voice inside our heads,' says a boy of nine, with 'a little mouth.'"²

Because this is a normal pattern in the development of children, the schools can easily organize their methods at these levels on the assumption that almost all the children they will deal with will have basically the same learning problem, distinguishing between themselves and their feelings, other objects, and the situations they are involved in. That the atmosphere of the primary school often seems like a rather genial psychiatric ward is not an accident; most forms of serious mental disturbance exhibit the same distortions and magical elements of the normal childish perceptions.

The second stage of the education of youth is dominated by very different tasks. We expect the school and the college to work on at least two major ones: prepare the child to accept the responsibility of adult roles he will have to assume later, and orient him to the much larger world of time, space, and human relationships. Now that he sees the world about him with some accuracy, he must find out at least sketchily how it got that way, what levels of social and political



1. The first part of the document
 discusses the general principles
 of the system. It covers the
 basic concepts and the overall
 structure of the system.

2. The second part of the document
 describes the implementation details.
 It provides a detailed overview
 of the system's architecture and
 the various components involved.

3. The third part of the document
 discusses the performance and
 scalability of the system. It
 includes a detailed analysis of the
 system's performance under various
 conditions.

4. The fourth part of the document
 discusses the security and
 privacy of the system. It
 provides a detailed overview of the
 system's security measures and
 the various security protocols used.

5. The fifth part of the document
 discusses the future work and
 the challenges ahead. It provides
 a detailed overview of the system's
 future development and the
 various challenges that need to be
 addressed.

authority he must respect, which he can reject without fear of punishment, and which he *must* reject.

The school during this stage becomes quite a different one; its major teaching goal is to help the student recognize and respond correctly to a great variety of events, objects, simple relationships, and socially shared values: the American Revolution, which began almost 200 years ago, was a great milestone in man's freedom; South America is a mass of land vaguely south of us and contains many simple-minded people who for some reason do not like Americans; Shakespeare wrote many widely admired plays at a time when people went about in tights; and the like. The school's atmosphere changes considerably to a predominantly paternal one—the tone of most elders in most cultures inducting the young into the mysteries of the society, performing the *rites de passage*; at higher levels, the master and the apprentice.

The Adult's Learning

Adult education has only recently begun to seek a separate and special identity for itself, and although there has been a strong current in the field toward the building of totally separate educational aims and methods, notably in community development, the practice in the larger institutions carrying on adult education has been "adoption without adaptation." Historically, the education of adults has tended to develop as a series of offshoots from institutions or organizations whose major function continues to be some other activity; the public schools, universities, the army, and industry are obvious examples. Little wonder that they should find it convenient and economical to transfer the methods already in use.

But even the cursory examination of the normal patterns of schooling in the preceding paragraphs suggests at least several very important differences between the youth and the adult which ought to concern the programmer of adult education:⁸

HETEROGENEITY. The rather primitive learning tasks which the child must tackle—and which are *common* to all children—find no substitute in the adult world. The normal adult's perceptions are stable, at least relatively so, which is why most laboratory experiments in the psychology of learning must use either animals or young children. The things the adult needs to learn or wants to learn are so wildly various that the traditional pattern of group instruction has difficulty fitting itself to so different a task. Nor does adult hetero-

geneity relate only to his motivations or to what he will attend to in the learning experience. It arises as a problem very sharply indeed as variations among individual members of a group in knowledge about and previous experience with almost any possible topic.

STRUCTURE. For the child, in very significant measure, learning is the job of identifying new things, events, or relationships which he has never before come across. He is like the inexperienced birdwatcher for whom every bird is a "first." The adult is the experienced veteran, who approaches each sighting with a highly complicated set of expectations and a great deal of experience against which to check what he sees; every field identification for him is structured by these past experiences. For the learning adult as well as the veteran birdwatcher there is always a danger that his previous experience may distort as well as enrich. The hope that one will some day see a prothonotary warbler may lead to a triumphant identification on the basis of very little evidence; so the adult learning a new concept in the social sciences may change it to fit into his own organized body of ideas about society.

MATURITY. Someone else is always "in charge" of the youth. The adult, if he wants to, makes his own decisions; his mistakes are his own, his achievements his own. The distinction is the one between guidance and counseling; we speak of guiding the young because they are not yet equipped to make wholly rational choices, but few of us are willing to take the terrifying responsibility of "guiding" a mature person. The appropriate counterpart is the process of helping the adult see more clearly what it is he *does* want and the realistic alternatives from which he can choose. But the practical consequences of this distinction are not easy to deal with. There is something grand about taking an extreme stand on the matter and saying with Carl Rogers, "It seems to me that anything that can be *taught* to another is relatively inconsequential and has little or no significant influence on behavior. . . . Truth that has been personally appropriated and assimilated cannot be directly communicated to another" or "It becomes teaching and its results are inconsequential."⁴ Unfortunately this view is not very helpful to those who bear some institutional responsibility for communicating important concepts and skills to others. In particular it does not help solve the practical problem of the degree to which one ought to permit adult students to decide what it is they wish to learn and how they should go about learning it. Later chapters will take a much more flexible position on this issue and suggest that the degree



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to which maturity must be taken into account is almost invariably determined by the overriding goals of the particular program.

SOME SIGNIFICANT DIMENSIONS OF CHANGE

Framework #1: Subject Matter

The adult educator works in so many different fields and at so many levels that it is difficult to designate the basic units for an orderly view of the learning problems which need discussion. One common way of dividing up the field, for example, is to consider it as a series of roughly similar institutions: universities and colleges, public schools, associations, and so on. Such a division is ordinarily very useful for considering administrative problems, but there is so much overlapping in the actual operations which the institutions perform that the methodologist must look for other categories.

We face an even greater variation among the types of change which different adult education enterprises seek, to be sure; the bewildering diversity of subject matters and levels at which instructors or leaders deal with them is staggering. But the *nature of the change desired* is obviously our particular appropriate building block, and to deal systematically with adult learning experiences one must impose some kind of order on the wildcat diversity which the field exhibits, whether or not that order introduces a degree of artificiality.

Using Whiting's categories,⁵ adult behavior is based either on a technique, a belief, or a value. A *technique* is a known relationship: to start a car, turn this key; to bake a cake, take three eggs, a cup of flour. . . . *Beliefs* are culturally shared notions of relationships, with no really well-tested basis necessary: spare the rod and spoil the child, for example. *Values* are shared judgments of goodness and badness or preferences for one kind of behavior over another: one ought to have fun with one's children, criminals should be punished for their sins, and so on.

A change from one state to another of any of these bases for behavior requires some conviction that present techniques, or beliefs, or values, are in some way inadequate; the crucial educational point is that each of them requires different tests of adequacy. We subject techniques to pragmatic testing. The easiest way to find out whether a recipe works is to try it and see, and few of us in the ordinary course of events have any emotional commitment to any particular technique.

Indeed, men discard old techniques and acquire new ones so readily that in areas where such technical change involves values, such as the maintenance of a given number of jobs in the building trades, artificial barriers to change are erected.

We test the adequacy of beliefs first by whether or not they fit well with our other beliefs and second by whether they correspond to reality. That we are inclined to test beliefs with less rigor than we do techniques is a fact well-documented by the mutually contradictory beliefs all of us live with, as well as the persistence, even in such a highly urban and well-educated culture as the United States, of folklore and superstition.

Finally, values present the most difficult testing task, because they cannot, of course, be "false"; they can be accepted or rejected. We test our values either by examining their goodness of fit, as we do beliefs, or by following out their logical consequences, but we cannot fail to be impressed by daily evidence that the most horrible consequences will often fail to deter people from behavior rooted firmly in value systems. ". . . while to my shame," says Hamlet, "I see the imminent death of twenty thousand men that for a fantasy and trick of fame go to their graves like beds."

The sociologist prefers to work with patterns of techniques, beliefs, and values as they cluster in and connect with social institutions, but the adult educator may find it more useful to view them in the context of *the worlds which the adult directly experiences and out of which his needs for education emerge*. The following set of broad categories is intended to supply a subject-matter framework within which one can identify relatively specific behavior changes which set problems for education.⁶

PERSONAL AND SOCIAL WORLD. Programs which fall in this class include those devoted to examining interpersonal relations in the family, the social problems of the local, national, and international scene, and the moral and ethical problems of the individual.

Example: A short course given at a local high school on child psychology, conducted by one of the counselors on the staff of the school system, attended by a group of mothers from the surrounding area and by a scattering of fathers.

Example: A series of television programs on the problems of the St. Louis metropolitan area: transportation, taxes, crime rate, etc.; beamed particularly at small groups previously organized to discuss these problems, meeting in living rooms around the city, and provided with special materials and an opportunity to call in questions.



Example: A semester-length class on U.S.-Soviet relations, with particular attention to problems of the missile gap, presented by a university extension division on campus in the evening, taught by a professor of political science.

Example: A series of meetings on world politics, organized by an evening college but held off-campus in the living rooms of the participants, provided with special discussion materials but using nonprofessional leadership for the discussions.

Despite the diversity of programs in this field and the vast differences in institutional orientations, they exhibit some common elements of considerable interest.

1. Programs are based on confused or uncertain bodies of knowledge, on disciplines which are for the most part in early stages of development. Psychology, sociology, and political science have grown as scientific disciplines only in the past century and are characterized by the early science's contradictory evidence, premature theorizing, ambiguous findings, and relatively uncertain conclusions. Yet it is an area in which people want most desperately to have unequivocal answers to the problems which perplex them.

2. The area tends to include issues about which people feel very deeply and toward which they have attitudes firmly linked to significant early experiences: feelings of patriotism or of political cynicism; negative attitudes toward those of another color or accent; motherhood, real estate taxes, parental authority, living next door to a Negro family, love, censorship—our attitudes toward all of these are important parts of us and our self-image. It has become clear in recent investigations, for example, that attitudes on such matters are to some degree influenced by whether one's father was employed in an "entrepreneurial" occupation or a "bureaucratic" one: on the one hand, independent small farmers, businessmen, doctors and lawyers, or other professionals on their own; on the other hand, civil servants, salaried workers in large companies, big-business executives, or school janitors—those with jobs which are part of a large complex of relationships. Whether we catch the actual attitudes or merely take over a predisposing personal and social orientation does not matter for our purposes. It is a very uncomfortable area of change for adults.

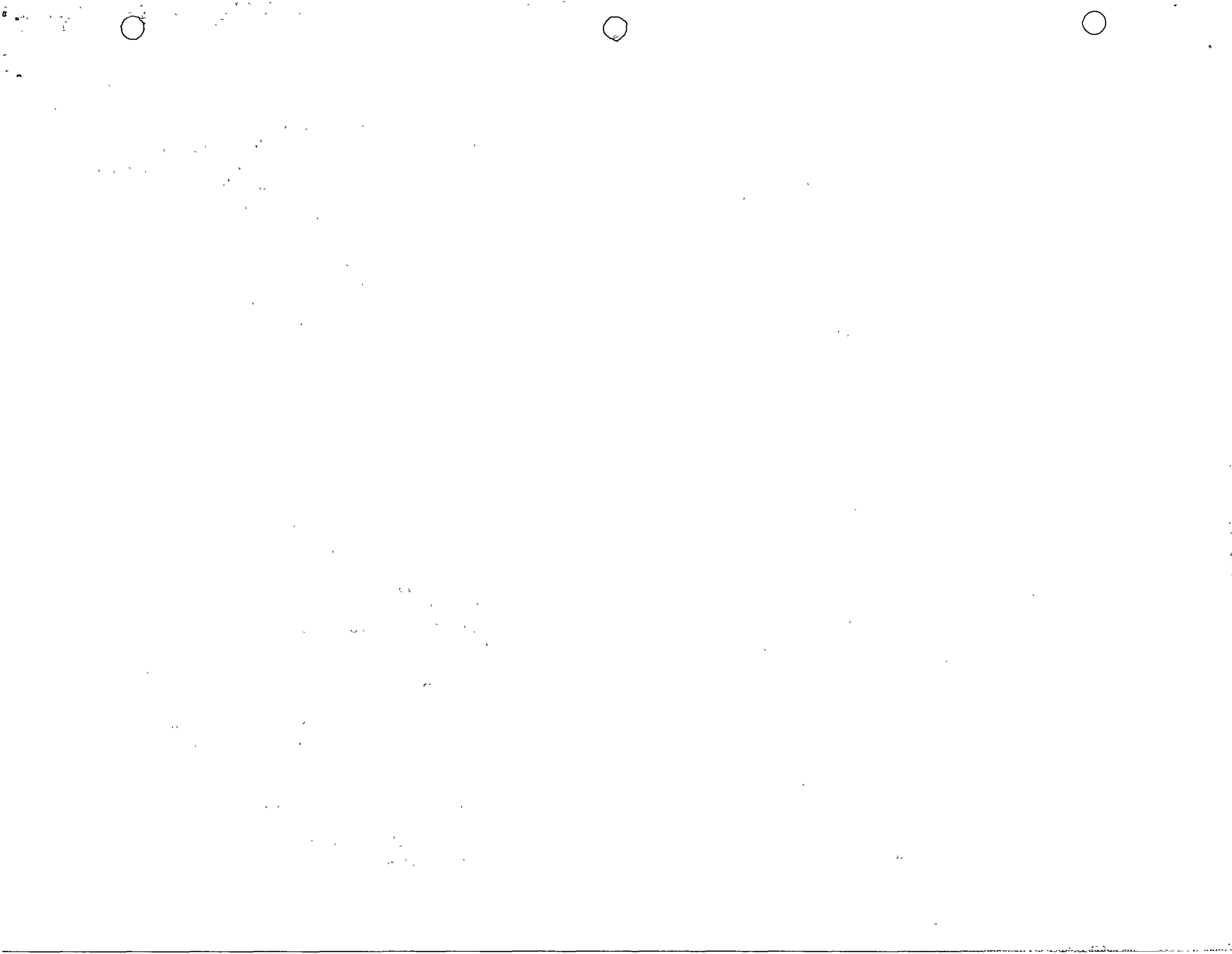
3. The discomfort relates not only to the early anchoring of these attitudes, but to the probability that people are often in conflict about the desirability of changing their behavior in this area. A mother may feel uneasy about her present relationship with her children, for example, a feeling which may motivate her to attend a series of lectures

on child-raising. But her present behavior satisfies some need of her own and consequently represents a resistance which an increase of information in itself is unlikely to change. This area, pre-eminently, is one of superficial change on the verbal level, often detached from any real change on any other behavioral level.

Programs in the personal and social area, whatever their subject-matter specialization, usually concentrate on attempts to change people's values or to improve their techniques of social interaction. The adult does not need to know about his culture so much as he needs, on occasion, to puzzle out its contradictions, to find out why his habitual attitudes no longer work, or to learn why other people's reactions to him are not as he might wish them to be.

A case in point is the recent change in the beliefs about child-rearing. Wolfenstein's amusing and instructive study of the advice given to parents in the bulletins of the Bureau of Child Study⁷ from the First World War to the present makes dramatically clear the successive waves of very different feelings about maternal behavior. It is not merely that in the early period the mother was expected to treat the child with much more systematic care than in the later period; she was also instructed to develop a different relationship with him. The bulletins in the early period told the mother to refrain from too much contact, to set up rigid schedules for feeding, and to restrain any of the child's exploratory activity; they told her in the later period to enjoy fondling and playing with the baby, to feed him on demand, and to remain unworried about his playing with his own body. But all of the prescriptions for individual acts of child-rearing add up to a good deal more. They demand of the mother a different style for playing her role; they emphasize the satisfaction of significantly different needs. In the one case the mother is to view the child as a bundle of strong impulses, some of them evil ones, which must be tamed and kept under control; in the other the child is a mild, harmless, playful creature whom the mother should enjoy and play with.

Juvenile delinquency is another public concern which is often a subject of adult education programs and which similarly includes both of these levels of change, though in a broader context. In considering it as a community and to some extent a national problem, one needs, to be sure, to confront questions which are either factual in character or which make almost purely logical demands of the students. How much juvenile crime is there, for example, and should one make a distinction between actually criminal behavior and delin-



quent behavior? Is delinquency primarily behavior of lower-class boys, or do the ambiguities of police reporting of crime conceal a proportionately equal share by middle-class boys? Such questions, although they may be usefully considered by the citizen, are problems for the social scientist.

The *public's* problem is centered in the feelings of people toward delinquents, feelings which are inappropriately shifted from the authority situation of the family to the society at large. To a person who grows up in a patriarchal family, anger, followed by punishment, is the proper response to a misbehaving child; but the community is not merely a primary family unit grown large, with the police acting as a collective paterfamilias, and the application of righteous anger and punishment does not control the boys or solve the situation.

In general, then, the education of adults in the personal and social area inevitably emphasizes the examination of beliefs and the adjustment of values which are often lagging behind a changed reality. There are few techniques in the world of social relations, and those that exist demand a special, complicated educational program to communicate adequately. The methods of group dynamics, which do deal directly with techniques, some of them verging on the borderline of group therapy, will be described in a later section, but they demand highly skilled personnel and are unlikely to take a substantial position in adult education for some time. The major emphasis in the personal and social area as a whole will probably remain on the need to change belief systems of adults to enable them to make social responses relevant to changed relationships.

THE WORLD OF WORK. This area without question dominates the activities of the field, as it dominates and overbalances the institutional range of the society at large. The spectrum of the courses, curricula, institutes, conferences, and workshops offered to help people learn new skills, brush up old ones, or keep pace with a technology which is changing with fantastic speed, is as broad as the range of work itself.

Example: A high school in a small industrial city offers a group of a hundred or so courses primarily for young adults, those who have finished high school but have decided not to go on to higher education.

Example: A private university with a city campus offers certificate programs in business as well as full B.A. and B.S. degrees in business administration, given in the evening. It might offer a partial or complete degree in journalism or law, too.

Example: An industrial company of considerable size runs a large training program in one of its major plants and offers instruction in indus-

trial skills to upgrade workers, introduce new techniques, and improve supervisory performance. The training division might also offer a special program in human relations or communications for executive personnel.

Example: The extension division of a large state university, as part of its general program, operates a large hotel with special conference rooms. Groups from all parts of the state come to the campus to spend from two days to several weeks to work on special problems of their profession or trade, to catch up with new developments, or to plan Association activities. The resident faculty is called upon both for program planning and for teaching.

Example: A university offers a ten-week summer program in the social sciences for a small group of labor officials; similar shorter programs are offered in many parts of the country for executives of business and industry.

Example: A university extension division organizes a three-day conference of scientists engaged in work on missiles in order to bring them up to date on the meaning of new technical developments.

In an era which features a demand for increasingly technical skills for an automated economy, accompanied by what appears to be a permanent pool of unemployed, many of them functionally illiterate, adult education faces a challenge of great magnitude. But the challenge is to develop ways of identifying needs, measuring workers' potentials, counseling, and finding instructional resources, rather than to find new techniques of training. The early pilot studies in this field support the view, for instance, that many blue-collar workers are capable of acquiring white-collar skills if we employ reasonable screening procedures.

Despite the extraordinary range of courses and programs which one can consider to be vocational in intention, these activities pose few serious problems for adult education. One need only contrast their general characteristics with those of the preceding area to see why this is so.

1. Above all, the adult student brings to vocational education a consistently high level of motivation. His purpose is generally clear and the rewards for effort are usually fairly visible. Often a promotion, a new job, or a raise in salary is directly linked to his completion of a particular course. Even when the connection is not so immediate, however, the goal may be so powerful in promised social status or economic reward that the motivation to reach it can sustain long years of persistent effort. We see this often astonishing persistence mostly in the college degree programs, but it exists in other fields as well. As the once free-wheeling economy turns into vast hierarchical organizations, shutting off previous opportunities for the ambitious



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and energetic, education remains as one of the few means for upward socio-economic mobility.

2. Most education in this area also appeals to what is apparently a widespread characteristic of Americans—an overwhelming absorption in the practical, the useful, and a corresponding suspicion of the abstract or theoretical. It makes *sense* to spend time and effort learning something that will put a little extra on the paycheck or help one advance generally, but businessmen and trade union officials alike seem suspicious of programs in the social sciences, for example, which are often planned for them. "What is this stuff supposed to *do* for us when we get back in the office?" they protest. Of course, the dislike of the abstract stops at their technical specializations; chemist, engineers, doctors, and other highly trained professionals gather happily at adult education centers to discuss the latest esoterica of their fields at levels of abstraction that would make a social scientist airsick.

3. The fields which make up the vocational programs are, for the most part, well-organized bodies of principles and relevant application. Teachers are usually experts in the particular field, and in adult education particularly, they are often experts with a great amount of practical experience behind them. Whatever their actual teaching experience or teaching skill, they usually have a relatively precise image of the objectives of their programs and of how to go about getting evidence of the students' achievement of those objectives. This concern does not even emerge as a problem at all at the level of machine skills; the test of whether a student can run a lathe satisfactorily is simply whether he can demonstrate that he can. Students and teachers alike have considerably less clarity at, say, the upper reaches of business administration, but even here there is considerably less ambiguity than in the personal and social area.

The vocational area is predominantly one of the transmission of techniques. For the most part the belief systems of students are subject to some kind of empirical check, sometimes disastrously, as in the case of some small businessmen whose test of their beliefs about consumer preferences ends in the bankruptcy courts. As for values, many teachers in this area appear to prefer to leave them alone and avoid even the discussion of these values involved in the social roles of the particular vocation or profession.

THE WORLD OF FORM. Adult programs in this area include all of those we might loosely categorize as the humanities, the study, or the creation, of works in which the formal elements are primary. This

area may well constitute the second largest of the general program categories in adult education, though it is difficult to find hard and fast evidence for such a belief. It certainly involves some of the most imaginative programming in adult education.

Example: A large suburban high school presents a wide variety of courses in the plastic arts—painting, sculpture, print-making—all of them focused on learning to create rather than on appreciation. Classes are kept small, and so are fees.

Example: An extension division of a large city university presents a two-year program of study of the performing arts: theater, opera, and concert hall. Emphasis is on formal analysis of the arts involved and on raising the level of sophistication of the judgments of the participants.

Example: A university college offers a weekend program, in a mountain lodge setting, consisting of the analysis of one Beethoven quartet.

Example: A midwestern small liberal arts college holds each summer a writers' workshop on its campus, at which aspiring writers gather to work and to submit what they produce to critical analysis.

Example: A large university holds each year, in cooperation with the city in which it has its campus, an arts festival which includes the presentation of concerts and plays, as well as public discussions of issues in the arts.

The examples selected give a hopeful rather than a quantitatively accurate impression of the arts in adult education. The applied arts, such as interior decoration (and cake decoration), jewelry design and construction with major emphasis, apparently, on how to apply enamel to copper, and pottery, dominate the field in number of courses and volume of students. Some aestheticians reject the inclusion of these educational efforts in the arts proper,⁸ but all questions of snobbery aside, it is difficult to know how to categorize them otherwise. Whether or not courses in crafts are trivial compared to those dealing with great painting, the former do deal with the aesthetic impulse on some level, with the desire that things should be beautiful. It would be difficult to deny the cultural value of the years of work by Cooperative Extension in helping rural women beautify their drab farm homes. This would be, to be sure, a social value rather than an aesthetic one, if the only product of the effort were brighter slip covers throughout the land, but not if it also raised the level of sophistication with regard to color and pattern of the women involved in the effort.

On another issue, the ideas about education of adults in the arts are sharply divided, as indeed arts education is in many other areas: should we emphasize creativity and teach people to *do* in the arts as the best way of teaching them to appreciate, or should we help them understand by verbally exploring and analyzing the art product? Of



course, there is no way of deciding which is more effective without a fairly elaborate study in which the many variables involved, such as the aptitude of the students and the length of time devoted to study, could be held constant for the purpose of comparison. In the absence of such experimentation it is perhaps futile to speculate; one possible hypothesis, however, is that people with some already existing flair for painting, for example, might learn a great deal by spending time at the act of painting itself, but that other students might learn no more than do children at their finger paints. As matters now stand, the issue is largely a theoretical dispute; most adult programs which stress creative activities do so with no more complicated a motive than to provide people with an opportunity for self-expression or relaxation.

Turning to characteristics which programs in the arts for adults have in common, one notes the following:

1. It is above all a woman's world. Traditionally American men have regarded the arts with some suspicion as a display of unmasculine interest. Though this attitude no longer persists so widely as it did, it has by no means disappeared. We find a preponderance of men in the mobility-serving programs in the vocational area, and the reverse is true in this field, as though most people in the culture still maintain the belief of the pioneer days that women are the culture-bearers and men the stern, super-masculine denizens of the out-of-doors.
2. The concepts and the objects of study in the area are least of all close to the familiar or the sensible; they do not follow the rules of logic and order so basic in Western industrial society. Children are not particularly interested in logical relations; their perceptions of the world often proceed on their own logic, and more than one student of child development has pointed out the similarity of the child's conception of the world to that of the twentieth-century artists's. But the adult is emotionally committed to a stable perception of life, and a great deal of his security is associated with that stability; if things are not really what they seem, then where will it all end, after all? Such insecurity poses very difficult problems to overcome in an area which demands of the learner some willingness to relinquish his sense of the familiar in language or in the visual world in favor of spending a great deal of energy in perceiving the shape of complex relationships which move under the surface of the art object.
3. The arts in general also provide a few practical problems of some magnitude. Large metropolitan centers have museums and art

galleries, an orchestra, perhaps a few chamber groups, several theaters, and at least one semi-professional theatrical company, but outside of these metropolises programs may have trouble with providing objects of study. The written word is everywhere available and technical advances in fidelity help make up for the sparseness of live orchestras; but many art educators find reproductions a bad substitute for actual paintings or sculptures. The performing arts, of course, require a real stage and a group of people with considerably more training than most communities are able to afford.

Arts education in general, and particularly for adults, deals fairly evenly with all three bases of behavior—techniques, beliefs, and values—but in very different kinds of programs. Where programs concentrate on the development of creative skills, they work mainly with techniques; where they attempt to raise the level of appreciation or analytical skills, their objectives are almost exclusively changes in beliefs or values, and for the most part, the latter of those two.

THE PHYSICAL WORLD. The physical sciences occupy an uneasy position in adult education, perhaps because of all the areas of developing knowledge and experience, they are most remote from adult role performance. Two major exclusions from the following examples of this area must be justified. One is a very large amount of programming that goes on in the upper reaches of mathematics, physics, and chemistry, programming whose purpose is purely vocational. Doctors, engineers, and working chemists attend such courses not out of an interest in the science but because they must keep up with their fields; these courses, consequently, belong in the vocational area and are noted there. The second omission is those programs arising out of a need to inform the public of, or to help people think about, the social consequences of scientific advance. Automation in industry arises from technical changes which now encourage the building of certain kinds of machines, but the only reason this constitutes a problem is that our social machinery is not adequate to adjust to the change without affecting adversely a good many people. Extraordinary advances in theoretical physics and mathematics permit us to build machines which have the capacity to blow up the planet; whether we are foolish enough to use them constitutes a problem of social and psychological dimensions. In the last instant of atomic annihilation, the person who understands the structure of the atom perishes along with the one without any knowledge at all.



Without these two major groups, adult programs in science are rather sparse. They include such programs as:

Example: General education courses in science, patterned on those developed for undergraduate curricula, are offered for adult students working on college degrees in evening colleges.

Example: Chicago's Basic Program includes a series of texts, examples of very high-level scientific reasoning, which students read and analyze in order to grasp the logical structure.

Example: A high school adult program includes as parts of its general short-course offerings several lecture courses on the new advances of scientific discovery.

Common elements among such programs as these are not difficult to see, and a look at them reveals many of the difficulties with present programming in science:

1. In no other field is the distance between the expert and the curious or interested layman so astronomical. The social scientist, however infatuated with new terminology, talks about phenomena which are thoroughly familiar to any lay person in the same culture. However exasperated the art specialist may be with the layman's preference for the homey simplicity of Norman Rockwell, he still deals with the same kind of object—paint arranged on a surface. But as soon as the scientist penetrates to matters which interest him at all, he leaves behind the person who is without rigorous training in mathematics.

The common solution to this difficulty involves the scientist's finding a way of explaining complex mathematical relationships in relatively simple verbal formulations. The science survey course usually results from such attempts, and it is hard to find anyone who is very satisfied with this answer. The scientific knowledge one gains from such programs can easily be equaled by an interested reader of such first-rate popular treatments of science as *Scientific American*, the science articles in *Life*, or some special television programs. There is little reason to wonder, consequently, why there is so little formal programming of this kind in adult education.

2. Other programs have tried to stress the learning of scientific methodologies as the most significant objective for learning in science, particularly for the layman. One immediately bumps into the same barrier as before. The methods of modern physics or, for that matter, modern biology are so complex and specialized that the layman is lost almost immediately. But if one means by scientific method the approach to the finding of explanations for phenomena or relation-

ships, an approach which is empirical, which works tirelessly to eliminate biases in both the material and an investigator, which is, when it can be, experimental, and which insists on impeccable logic in making inferences from the results of investigation, then the data of the physical sciences are not absolutely necessary.⁹ One could use the more familiar material of the social sciences or the earlier and simpler discoveries of any of the physical sciences.

In adult education, consequently, programs in the pure sciences are relatively scarce, even after the Sputnik-aroused surge of public interest at the end of the decade of the 50's. Perhaps as a generation schooled in the new mathematics and provided with new and stimulated physics texts reaches maturity, they will try to keep up with new developments through adult education channels. The chances are that any such demand will be met by TV rather than by any of the small group methods.

To generalize, this area involves no problem of values at all, but predominantly deals with techniques and with beliefs about the physical world and man as a physical being.

SOME GENERAL DIFFERENCES. It is clear that each of the four areas emphasizes a different pattern of subject matter, which considerably influences the desirable features of the learning situation. Learning recipes is a different matter entirely from shifting the orientation of our value system or testing the consistency of our beliefs. There is another dimension along which these areas vary, and that is the extent to which they need to be modified to meet adult needs. They have been discussed here in the order of decreasing need for modification; the approach to a student in the area of science, for example, depends less on his age than on his scientific sophistication, and many parents of this generation are baffled by scientific achievements which their twelve- or thirteen-year-old sons understand immediately. At the other end of the scale, the social idealism of some undergraduates rests in some measure at least on their lack of experience with the extraordinary complexity of modern social life; it is easy to talk about sweeping social change if one has not even had the exasperating experience of trying to change the coffee-break habits of a typist pool.

At the science end of the scale, methods appropriate for children need little modification for adults; there is no reason, for example, why the new physics and biology textbooks for the high schools might not be used with groups of adults who would, without doubt, get the same pleasure from doing the ingeniously contrived little experiments.



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But as we move toward the personal and social problem part of the scale it becomes increasingly necessary to take fresh approaches to method and to relate materials and activities to the special purposes and experiences of the adult and to the requirements of the special characteristics of the content area. To summarize this discussion in a general principle: decide *how much* modification of methods is necessary by considering the content area in which the program falls; then, determine the general direction of program planning by deciding which of the three elements (technique, beliefs, or values) of the culture complex we want primarily to deal with.

Framework #2: Behavior

Many definitions of learning exist, developed for a variety of purposes: some to guide research, others to complement educational theories. Those interested in the practical problems of increasing the effectiveness of learning experiences for adults can probably most usefully view learning as *some form of change in the behavior of those participating* in the program, primarily *cognitive* behavior, that is, behavior that has to do with knowing or recognizing, attributing meaning, and other intellectual operations. The elements of framework discussed in the preceding section represent a background, a broad field of operations; the more immediate question now arises of what we wish people *to do* with the subject matters relevant to the field, *what behaviors we wish to change*.

The question suggests a number of relatively specific problems which the chapters immediately following this one will discuss. A more general answer at this point requires a broad look at what the adult educators do along two major axes: the type of change they try immediately to achieve in student behavior and the long-range educational purpose that lies behind the effort toward change.

"KNOWING" AND "DOING". Any observer of the broad scene of adult education soon notices that programs differ significantly in whether they conceive of the student or audience as an active organism which must be trained in some desired behavior (whether it is analyzing a poem or running a lathe) or as an empty cup which the instructor must fill with knowledge. We have chiseled "knowledge is power" into the stone of most of our libraries and schools, and our firm commitment as a culture to the idea undoubtedly accounts for the dominance of the "empty cup" theory of method.

In a sense, "knowing" is a behavior, too. To demonstrate that

we know something we must go through some act of recognizing it or calling it back into memory. And if everything we know were made relevant use of in our behavior, knowledge in general would indeed be power. A laboratory rat which has been given the opportunity to run around in a maze days previous to the actual test will learn the maze quicker than his fellow who had not been given the opportunity to "know" the general environment of the maze. But humans are considerably more complicated and unpredictable. We unconsciously rummage among the knowledge available to us in any situation to find those bits that fit in with our desires or our preconceptions and to reject the ones that contradict them. The knowledge we have often has little effective relation to our behavior; we know that a significant percentage of automobile accidents are rear-end collisions, but we continue to tailgate the drivers in front of us.

In the face of a truly extraordinary mass of empirical evidence that the passive reception of statements of facts, opinions, or argument by itself has a very low efficiency if one desires change or growth in the recipient, by far the most common method of adult education is the assigned reading and unadorned lecture.¹⁰ From the beginnings of the early lecture series in the nineteenth century to recent national televising of popular charmers such as Baxter and Bernstein, telling people about things has been the easiest way to promote public enlightenment, particularly after the invention of instruments which carry the human voice to a mass audience. Although the lecture is far from being a useless tool for teaching, there is no question that we overuse it, that we use it inappropriately, and that, seduced by the ease of arranging to have an expert talk to people, we often neglect to think through the particular problem of method for our particular purpose.

The opposed conception of the student as a live organism who must be changed in some way by the process of learning and who needs an opportunity to practice new intellectual skills or insights is also firmly present in adult education. One finds the conception most prominently in the vocational area and the arts; few teachers of accounting would consider that they had succeeded at their job if they ended a course in elementary accounting after acquainting their students with the principles of the field but without requiring all the students to perform the necessary operations many times and submit their exercises to critical evaluation.

The problem is not that administrators and teachers of adult programs fail to recognize these elementary and obvious truisms of



learning, but that they see the necessity of applying them only in certain areas. The special conditions of the adult as student are influential, too. Active learning processes take time, more time than many adults are willing to give, and they make demands on the energy and concentration of the student which many busy adults find impossible to meet, except under conditions of very high motivation. These conditions occur mainly in the vocational area, and it is in that area, consequently, that one finds most appreciation of active methods in adult education.

LONG-RANGE OBJECTIVES. A second major determinant of method develops from the educator's conception of the purpose of the program.¹¹ A considerable part of the formal programs of adult education, particularly at the university level, seem merely remedial; that is, they adopt the educational purposes and methods of some other sector of education so that some adults may make up what they missed. Such programs face mainly administrative, rather than educational, problems, as they apply already formulated curricula and bodies of method to different times of day and to students with lower energy levels, using faculty whose basic loyalties lie with other divisions of the enterprise. But a majority of adult educators build their programs to fit some perception of the needs of an adult clientele which they have chosen, or have been hired, to serve. We can generally see in these programs two different kinds of purposes, whether or not they have ever been explicitly formulated.

The first of these purposes is to help the adult adjust to some facet of change in the society which affects his performance in a social role. The concept of role is particularly useful in this context because it specifies a pattern of behaviors and attitudes attached to a particular status in the society, shaped by the expectations of other people. For example, over the past generation the role of the supervisor in industry has radically changed; the people who matter once expected their supervisors to be tough, decisive men committed to carrying out their specific part of the enterprise at whatever cost. They now expect them to be understanding, considerate of the human relations problems involved in the groups they supervise, and committed to the organization rather than to the task itself. These changes in expectations create a considerable amount of tension in the system at large, as those playing supervisory roles begin to feel the pressure to change behavior patterns which they have grown up conceiving as right and proper ways of carrying out that particular role. It is at this point that adult

education of some form becomes necessary to train people in the new behaviors demanded of them.

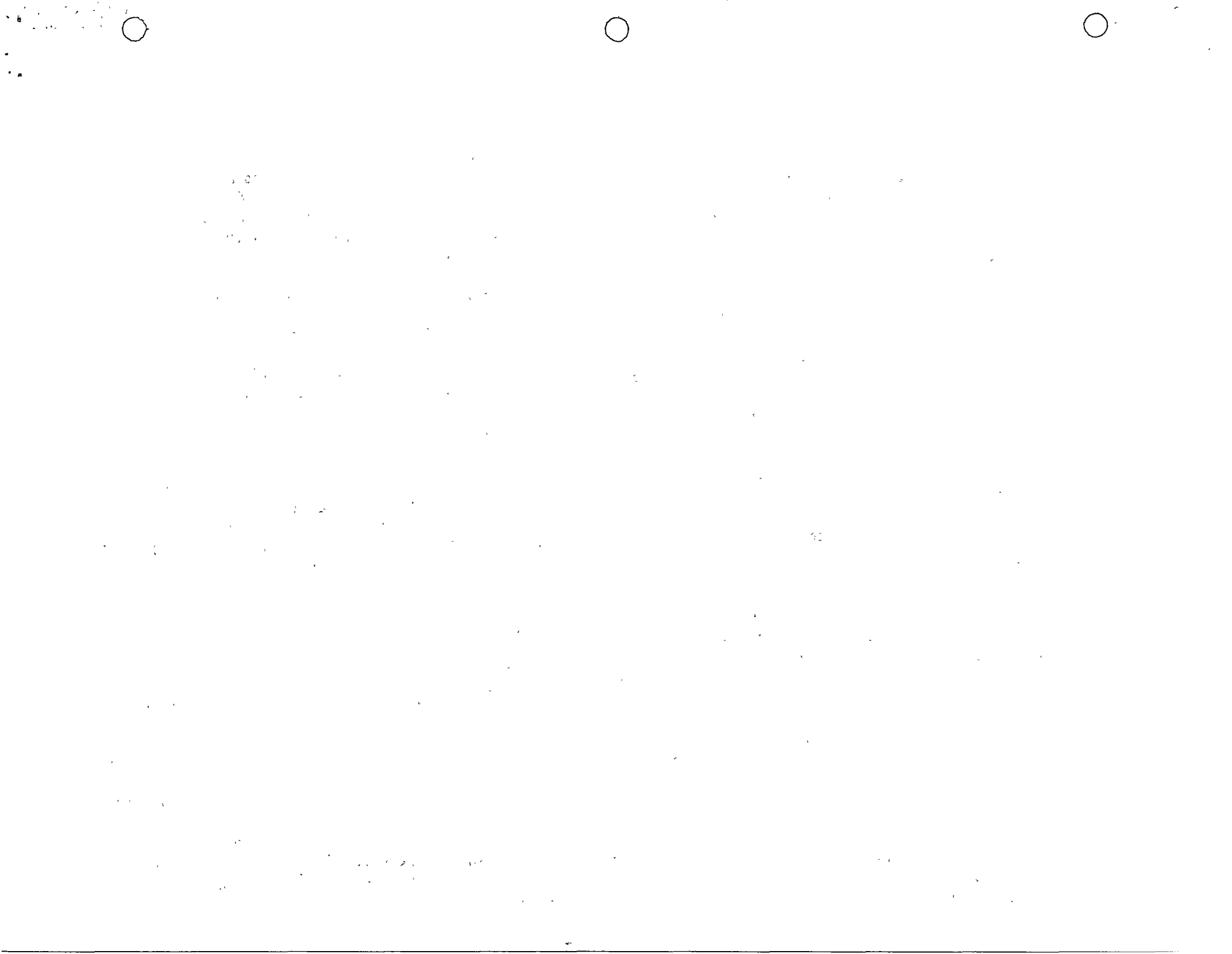
Thus do the relatively sudden changes in technology, beliefs, and values in the culture create demands for change in those who are beyond their formal schooling and consequently for novel educational formats for adults. From this viewpoint, adult education is a kind of vast, unorganized, flexible trade school for social role improvement and adjustment, as the accelerating tempo of social change in an overwhelmingly industrial and urban society demands quicker adjustments from its members. Historically, we can perceive this process occurring many times as adult education grew erratically in response to changes in role patterns. The rapid shift from a rural to an industrial society and the rate of technological innovation after the Civil War demanded a dazzling variety of new work skills, particularly of the white-collar kinds; a host of educational mechanisms sprang up to meet them. Similarly, following the peak period of immigration into the United States, adult education assumed the task of preparing the new Americans for their novel citizen role, mainly through the night-school settings immortalized in the incomparable figure of Hyman Kaplan. In recent decades, under the impact of changing roles in marriage, adult programs have paid increasing attention to marital adjustment and child-rearing problems. Sharply increasing amounts of leisure available in the society find their reflection in growing numbers of programs in both fine arts and crafts, as the role of "consumer of leisure" begins to take on definition.

Of the many social roles which adults in our society must play, Havighurst and Orr have discussed ten to which adult education must pay particular attention:

Parent	User of Leisure
Spouse	Church Member
Child of Aging Parent	Club or Association Member
Home Maker	Citizen
Worker	Friend

They have gathered and evaluated data relating to the extent to which middle-aged urban Americans see the need for change in themselves in relation to these roles, and suggest for adult educators to use in selecting program emphases an approach which has significant implications for the selection of materials and methods.

To illustrate, they define specifications for both an adequate and an inadequate fulfillment of the parental role during the middle years of life as follows:



*Setting Adolescent Children Free and Helping Them
to Become Happy and Responsible Adults*

Nature of the Task

Children are reaching adulthood and establishing their own homes, families, and careers. Parents can help in this process or hinder it. The task is hard for some parents, particularly women, because they have invested so much of themselves in the parent-child relationship, and have gotten so many satisfactions out of having children dependent on them. The artistic performance of this task includes giving the children a lift even though they do not realize it; enhancing their self-confidence by being confident of their success; supporting their efforts to prepare for and assume their positions as adults.

The major qualitative factor in a high level performance as a parent is that of growing toward a less dominant position in relations with one's children while maintaining a relationship which continues in an affectional way to be close but not binding.

High

Gets along with children on terms of growing equality. Has aided or permitted children to make independent choices of: place to live, job to take, person to become engaged to or marry, clothes to wear, college to enter, special field in college. Has become less dominant in relations with children during past 10 years. Spends less time with children than 10 years ago. If he supports children financially, does so unobtrusively and in a matter of fact way, without using this as a means of subordinating the child.

He does not interpret children's independent activities and choices as indicating a loss of intimacy. Rather, he gives evidence of his own confidence in the fact that there are ways in which he can depend on his children to meet his needs—to let him know what is happening to them and that they are actively interested in what is going on in his life.

Medium

Has definitely encouraged or permitted children to become independent in one or more areas, such as choice of friends, job, vocational choice, place to live; but retains a strong, almost compulsive interest in these matters and seeks, often by subtle means, to influence children. Feels that his judgment is better than that of children on important topics. Occasionally gives unasked advice, based on his wisdom or superior power.

Low

A. Dominates children, seeks to make decisions for them. Tries to keep them at home. Prevents them from having independence-building experiences—such as buying own clothes, choosing school or college courses, choosing friends, taking separate vacations from that of family.

B. Indifferent to or rejects children. Sees little or nothing of them. Does not give them emotional support. Takes no responsibility for them.¹²

The specification of high-level competence in the role obviously suggests the objectives for an adult program. This general approach to the purposes of the adult educator, as a diagnostic middle-man operating between new social role demands and the resources which may help people adapt to them, has the great virtues of directness, relative simplicity, and obvious appropriateness. The voluntary character of most adult education, the difficulty of persuading adults to commit blocks of time over a long period, the enormous individual variations in experience and intelligence among any adult group—all argue for the usefulness of this model, which permits us to be highly specific, short-run, and focused on areas of highest immediate motivation.

The success of this model, however, has led adult educators to pay less attention than it deserves to an alternative possibility which shifts the emphasis of program development from the social situation, demand, or problem to growth in the general abilities of the individual. Adult educators, to be sure, take pride in their careful attention to the individual student through their response to expressed needs and by their admirable sensitivity to individual difficulties with the learning situation. But the social-role argument suggests that in a very important sense we are interested in chemists and accountants, fathers and mothers, citizens and consumers of leisure, rather than individuals.

Even as a minor strain in the total effort of adult education, there have been a number of interesting efforts to build programs directed at improving the general abilities of individuals. Because the programs have, in a sense, cut across the grain of adult education and the circumstances which shape its normal patterns, they have had great difficulty in surviving; they are significant enough as a potential in the field, however, to merit attention in a discussion of methods, where they represent a real challenge to ingenuity.

Most efforts so far expended in this attempt to develop basic cognitive abilities have concentrated on training people in formal rational processes. The best-known example, perhaps, is the Great Books program, which organizes groups of adults for the relatively informal discussion of the enduring, recurrent ideas in the intellectual history of the West, sampled from the majestic literature of that history. This is far from "training" in any formal sense; the Foundation does not prescribe any rigorous approach to the ideas under discussion, taking instead the Athenian model of free men enlightening one another in the course of serious talk.

All such programs are deeply influenced by academic philosophy and particularly by the discipline of formal logic, but it would be

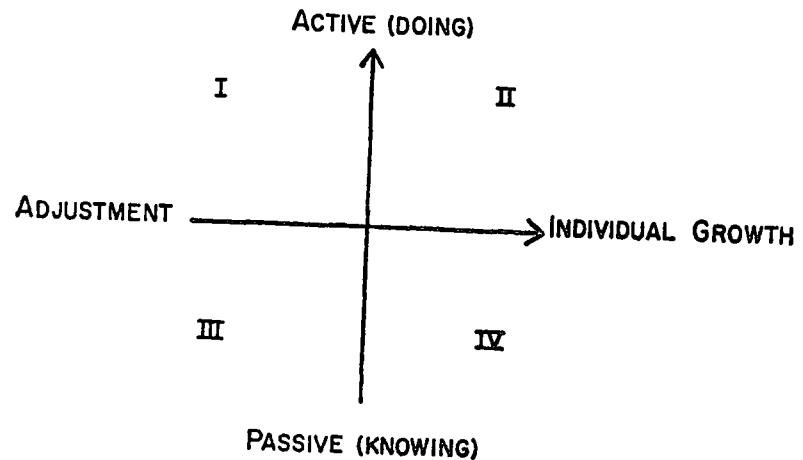


surprising if the pragmatic American temper had not produced experiments with more informal approaches to thinking, and there has indeed been in adult education a lively history of attempts to deal directly with basic problem-solving abilities. Few of these have developed into extensive or lasting formal programs; the tendency has been to consider training in problem-solving as one aspect of helping people solve immediate, specific problems with which they are confronted. Agricultural Extension occasionally claims improvement in general problem-solving ability as an educational byproduct of helping American farmers improve agricultural methods; community development specialists make similar assertions. Indeed, the one assumption in the field held most widely with great firmness in the face of almost non-existent evidence is that helping people to find solutions for a specific problem will somehow teach them to solve *any* problem better. Later chapters will examine such beliefs critically.

Behavior Models

As adult educators plan their programs, they select methods and materials on the basis of a series of preconceptions and purposes related to the formal set of categories described above. Program planners may be more or less aware of such formal conceptions, or they may perceive them in quite different terms, but this particular framework works very usefully in suggesting some ideal models toward which programs in the field appear to be moving.

If the two major continua are shown in relation to each other, the following scheme emerges:



To locate any specific program along each of the axes results in placing it in one of the cells, which may ideally be characterized by the dimensions which produce them, and which make different demands on methodology.

THE EFFICIENT MAN. Programs which emphasize the aim of adjusting adults to some dislocation arising out of social change, and which want to make a real difference in behavior, seem to be interested in producing an efficient person, one who now measures up realistically to new circumstances. A good example is the dramatic shift in the field of mathematics teaching following the public outcry after the first Sputnik. Teachers of mathematics in the public schools were not merely expected to learn new mathematical theory to replace the traditional mathematics they teach but had to be retrained to do a different kind of teaching task altogether. Another example of this active training for efficient adjustment is the ubiquitous training workshop in human relations for supervisors. Changes in the conception of the supervisory role have been met by constructing experiences in which supervisors not only learn new ideas of human relations but are required to practice the skills necessary to act them out.

The desirable image of the person we are seeking to produce in this area is the rational and efficient adjuster. A logical danger, of course, is that we may instead create the other-directed person, who shifts his behavior to conform to demands of others whether or not these demands represent serious needs in the society. As adult educators develop habits of looking more critically at the immediate aims of their communities, where these influence demands for new educational planning, such a danger perhaps becomes more remote.

THE INTELLECTUAL. Adult educators aiming at behavioral change in basic cognitive abilities of individuals, without regard to affecting specific social role activities, wish to produce people with a primary interest in ideas and the skills of manipulating them. The habit of detachment, the formal processes of logic and rhetoric, and the exercise of rational judgment are skills and attitudes which, once acquired, may be applied in any area of social life or, indeed, purely for one's own amusement. The parallel danger in this model is that we produce sophists instead, for whom social reality is merely a convenient source of stimulating problems for discussion.

THE WELL-INFORMED. Programs which stress the passive acceptance of knowledge related to social role problems seem to be striving toward a model of the well-informed citizen. We think im-



mediately of the early days of adult education and the Chatauqua lectures, as well as the early university ideal in the nineteenth century of humanizing knowledge, a noble aim which the practitioners reduced to the dispatching of lecturers out on a circuit. There is no question that the lifeblood of a democracy is a well-informed citizenry, but there is little doubt also that this particular model more often than the others tends to break down into its counterpart, the encouragement of dilettantism. Look, for example, at the steady growth of parlor psychoanalysts who need only an acquaintance with the terms "id" and "superego" to go into informal practice immediately.

THE EXPERT. Finally, the concentration on individual growth through the relatively passive acquisition of knowledge seems aimed at producing the expert. The common model for adult education is the intensely technical three-day- or week-long institute at which changes in the tax law, for instance, are communicated and expounded at Talmudic length and complexity to people who are already tax experts. This is a service function which adult education as an institution can hardly fail to play in a society which increasingly needs it, as professions of all levels become more complex, and perhaps it is almost inevitable that such a model ends up producing the over-specialized person.

PURPOSES AND METHODS

Most adult education programs approach, at least in the intentions of their creators, one of these models or some combination of several of them. As sets of general purposes operating in response to expressed needs in the society, the methodologist cannot question them; what he can usefully do is to indicate the problems of finding methods which are appropriate to each one of them. Many of the present practices in the field create methodological dissonances with program purposes, for the following reasons:

Inappropriateness

The most common disparity of this kind occurs when program planners and teachers assume that methods which are most useful in producing experts also are ideal for the development of intellectuals. The expert usually demands to be brought up to date in one way or another, and as he is in possession of a large body of already well-integrated knowledge, he is capable of sitting passively and absorbing

and integrating floods of new information and concepts. If we aim at developing intellectuals, however, the range of knowledge they have is really of a low order of importance; what they need is to practice intellectual skills, and no amount of listening to experts or to other intellectuals will substitute for active practice. The evening colleges are properly cautious about mixing credit students, who are aiming at becoming experts in some field, and non-credit students, who want to sit in out of intellectual curiosity. Faculty complaints in this situation commonly focus on the problems this presents for the credit student, but the non-credit students get considerably the worst of the bargain; as would-be intellectuals they are likely to get almost no help from the traditional methods of the college credit course. Even more striking is the tendency to plan elaborate institutes for adults in which no academic requirements are involved at all and fill the program with session after session of lectures. In the context of this discussion a little learning may or may not be dangerous, but it is not very useful.

Inadequacy of Available Teaching Skill

Often enough, we select a method appropriate to the purpose of the program, but the teachers lack the necessary skill. A most interesting instance of this difficulty may be found in the numerous attempts to develop informal discussion programs, based on important problems and ideas and led by lay discussion leaders. Such programs propose to help the adult citizens who participate think through public issues to much more sophisticated positions, help them evaluate current policies, and understand more completely the complex relationships involved in the social and political scene about them. Group discussion, conducted as disciplined exploration of problems, as a thoughtful exercise in cooperative inquiry, is a method precisely shaped to help people change in these directions. But such an enterprise demands a high order of skill from its leader or an extraordinarily well-trained group of participants. Much to the credit of most of the agencies which have attempted to develop such programs, they have experimented with a number of training devices for improving the discussion-leading capabilities of the lay citizens involved in the programs, but this, in itself, is a very difficult training task.

Inadequacy of Method to Purpose

Sometimes we hope to bring about changes in adults which no educational method, no matter how active, is likely to achieve. This



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particular discrepancy between purpose and method is most likely to occur in programs seeking to develop behavioral changes or attitude changes strongly linked to established personality patterns. The best developed area, methodologically, in adult education is the one devoted to improving human relations skills in industry; for over a decade some of the most ingenious psychologists in American universities have devoted themselves to the planning of educational experiences which would most powerfully affect attitudes and behavior related to interpersonal cooperation and conflict. No matter how well thought through and scientifically based such teaching is, however, a considerable number of adults remain relatively untouched by it. Their resistance to such change is so strong that one suspects that only psychotherapy could manage it, if, indeed, they were ever motivated enough to seek therapy.

As adult educators develop clearer and more coherent images of particular purposes with particular groups of adults and adopt more experimental attitudes toward methodology, we can make such analyses as the one above sharper and more detailed and advance toward an established set of methodological principles for adult education. For the present, a rough framework such as this, constituting a general perspective, must serve the need for theoretical background for the specific chapters to follow.

NOTES

1. Adult educators commonly look only at the education of adolescents when they attempt to formulate critical differences between childhood and adult education. As I suggest in the distinction made here, the demands which shape the schooling of the child and adolescent differ considerably, shifting from ones which are based on the psychology of the pupil to his social context. This may be one of the reasons behind the concentration of the adult educator on the social setting of his students rather than their psychology and, consequently, what seems to me the rather cursory attention to method in the field when compared with our (mainly sociological) preoccupation with purposes. But many of the problems which teachers of adults must struggle with, particularly in life areas where attitudes tend to be strongly developed and deeply rooted, resemble those of the teachers of children. Many adults, who have led busy lives immersed in an often narrow sector of the larger society, have grave difficulty in the learning situation adjusting their perspective to a broader gauge, cling to comfortably familiar sets of verbal symbols almost as if they were magic amulets, or have difficulty substituting analysis of problems for "devil theories" of social evils. Adult educators should find it rewarding to become familiar with such studies of the cognitive processes of childhood as J. Piaget's *The Child's*

Conception of the World (New York: Harcourt, Brace, 1929), and Heinz Werner's *Comparative Psychology of Mental Development* (New York: Science Editions, 1961).

2. Piaget, *op. cit.*, p. 229.

3. This view of the special nature of adult education is, of course, only one of many, and I claim no particular virtue for it beyond its usefulness for the general purpose of this book. Most such analyses concentrate on drawing distinctions between the characteristics of the adult and those of the child, particularly as those characteristics are modified in the adult by life experiences. Whipple's monograph is the most carefully thought-through of these attempts, and I agree thoroughly with his conclusions. The reason that I did not use such a framework here is that arguing from differences in experience seems to me to lead primarily to formulating different curricula or to selecting different materials for educational use. But aside from such reasonable generalizations as that people with greater experience ought to be given a chance to relate that experience to the educational process, such an approach has little to say for the methodologist, or, at least, what it contributes lacks the necessary precision. I have concluded that considerations of method develop more fruitfully from an analysis of the aims of the adult educator as they differ from setting to setting and from those of the educators of children. But, see James B. Whipple's *Especially for Adults*, Notes and Essays No. 19 (Chicago: Center for the Study of Liberal Education for Adults, 1957), and also Jack R. Gibb's "Learning Theory in Adult Education," in Knowles (ed.), *Handbook of Adult Education* (Chicago: Adult Education Association, 1960). Most of what Gibb says about the adult learner, it seems to me, can be as readily applied to the learner at any stage or age; it is the ingenious application of learning theory to specific aims of varieties of adult educators which provides us with a more fruitful approach to method.

4. Carl Rogers, "Personal Thoughts on Teaching and Learning," *Improving College and University Teaching*, Vol. VI, No. 1 (Winter, 1958), pp. 4-5.

5. Whiting's view of culture as essentially a system of symbolic and cognitive systems of techniques, beliefs, and values seems to me to provide a very useful set of terms for the adult educator, however objectionable it may be to the anthropologist who prefers to see culture as patterns of behavior. In the first place, the framework provides a neat way of linking the socialization of the child to the world of the adult: the three elements of techniques, beliefs, and values in combination form what Whiting calls the "custom complex," a blueprint for action which the culture transmits to each child through his parents. In a rapidly changing culture, by the time the child has grown to adulthood his cognitive maps often need considerable adjustment, which is essentially the job of adult education.

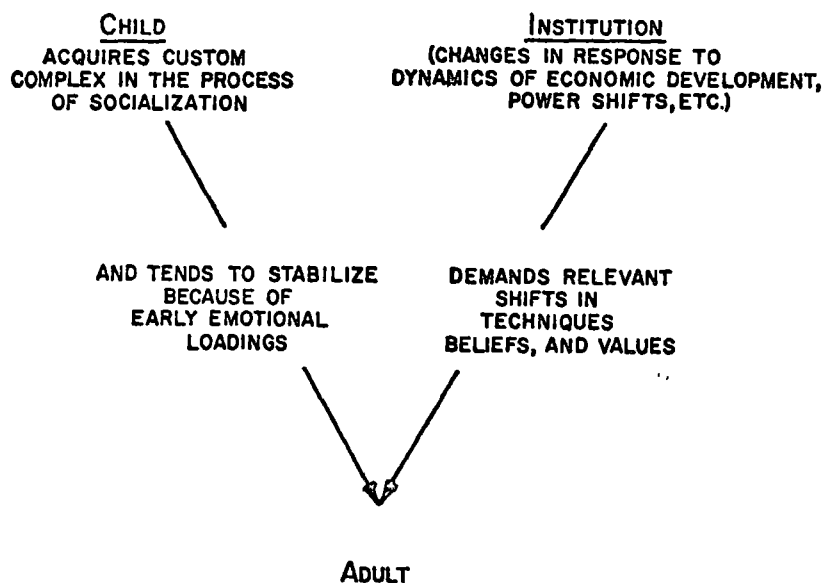
In the second place, Whiting's scheme links culture with the social order, the institutional complex around which adult education tends to organize its activities. "The custom complex, however, is but a beginning. It describes the blueprint for but a single action of a single category of persons in a single situation. Custom complexes are, however, organized into roles that are played in institutional settings. . . . We would adopt, with slight modification, Malinowski's (1944) definition of an institution as being a group of people occupying different statuses (personnel), who are expected to perform certain roles defined in terms of techniques (norms and rules), agreeing upon certain values, and



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accepting certain beliefs (charter). . . . In sum, a culture consists of a set of customs which may be divided into techniques, beliefs and values that are in turn integrated into the systems of ethno-science, ethics, and pragmatics. Customs are combined into roles, that are combined into institutions." See J. W. M. Whiting and I. L. Child, *Child Training and Personality* (New Haven: Yale University Press, 1953); J. W. M. Whiting and Beatrice B. Whiting, "Contributions of Anthropology to the Methods of Studying Child Rearing," in Mussen (ed.), *Handbook of Research Methods in Child Development* (New York: John Wiley & Sons, 1960).

A schematization of this conception which relates social change to adult education might look like the following:



6. Another possible set of categories, of course, and one frequently used by adult educators, is based on special groups in the population—young adults, the aging, and the like. This conception seems to me useful mainly as an administrative convenience, and I have restricted the framework to the four worlds of experience suggested in the text in order to keep the conceptual framework as clear as possible. It fits the available interest areas of adult educators fairly well; see, for example, Part IV: "Program Areas in Adult Education," *Handbook of Adult Education, op. cit.*, pp. 393-550.

7. Martha Wolfenstein, "The Emergence of Fun Morality," *Journal of Social Issues*, Vol. VII, No. 4 (1951).

8. The general issue here is not entirely peripheral to the problem of method, because it involves the formalization of training processes for low-level skills which once were transmitted directly from one person to another in very informal contexts. The clearest example I know is the course successfully given for many years at a midwestern university to train people in church ushering,

which is a remarkable illustration of how far the role of adult education can go in a society in which institutions are rapidly changing. If the tempo of social change is slow, institutions can take care of their own training needs. Fathers can transmit their vocational skills to their children, and some children will pick up the know-how of church ushering as they grow up attending the same church in the same town. If institutions change, and the personnel in them shift rapidly, too, then formalized training begins to seem necessary. The question is whether a total adjustment to such blind social demand does not make dangerously trivial the educational institutions and divert the energies of their personnel.

Where such programs are justified as contributing income needed for self-supporting divisions, one can hardly argue with them. But often enough, adult educators argue for them as providing an educational contact with a clientele; "starting where they are" it is often put. Partly as an expression of a strain of social evangelism which entered adult education in its early years, and partly as a reflection of the egalitarianism basic in American values, this doctrine has its usefulness, but not if it becomes the sole criterion for programming in adult education. The field as a whole would benefit from a somewhat clearer division of labor among its separate institutions than it now enjoys and, more important, from an agreement on some rough criteria for the involvement of specialized educational resources. There are many areas of needed training which are best handled by using simple "apprenticeship" methods, and there seems to be no reason why we should not encourage their use.

9. The argument for the inclusion of science in any general education curriculum needs, it seems to me, considerable scrutiny, as the questions raised in this section indicate. All members of the society, presumably, ought to be free of superstitions involved in cause and effect relationships in nature, but my guess is that by high-school graduation most adolescents these days are as rational about nature as they are going to be. We must suppose that there must be a greater virtue in the study of science beyond this, and it is often suggested that knowledge of science helps people become more rational, that practice in the rigorous scientific approach to phenomena and to the generalization of their relationships spreads to other areas of the individual's life. No one, of course, really believes this happens, and the general principle is seldom supported by someone's experience with some actual group of scientists who approach the discussion of politics or socialized medicine with a great show of rationality and the spirit of inquiry. Indeed, the intrusion into science itself of related social problems of belief or value may be sufficient to modify not only rationality but basic scientific attitudes. Some scientists with considerable background in biology, for example, believe firmly in the constitutional racial inferiority of the Negro and argue for it on the historical basis that no Negro civilization ever produced spontaneously a complicated, industrial culture. On the whole, I tend to view with some equanimity the relative absence in adult education of programming in this area, until someone presents a more convincing case for a need for it.

For evidence of a recent revival of interest in this area, however, see the summary of recent activity in science programming in the newsletter, "Continuing Education for Adults," of January 29, 1963, published by the Clearinghouse of the Center for the Study of Liberal Education for Adults.

Eric Ashby does a fascinating dissection of the problem of how much science the administrator of scientific research enterprises should know, in "The Administrator: Bottleneck or Pump," *Daedalus*, Vol. I, No. 2 (Spring, 1962).



Ashby argues wittily that the administrator needs to know about scientists rather than about science, and the same may be true of the layman in general.

10. Although some of the associative theories of learning do not stress the need for the learner to be active, all cognitive theories do. The learner must be involved and active, either in practice or in an active search for meaning, a point which will be considered in greater detail in Chapter II. The most important drawback to the passive learning role is suggested not by learning theory but by the work done on memory and perception; what the student retains is a selection determined by his preconceptions. See Frederick Bartlett's *Remembering* (Cambridge: Cambridge University Press, 1954), or the section devoted to perception in any social psychology text.

11. I am aware that the categories of aims suggested here are not the usual ones, nor are they justifiable on any particular philosophical grounds. In the *Handbook of Adult Education* Powell and Benne argue for the existence of two major schools, the *developmental* and the *rationalist*, with community development and group dynamics falling in the first, and liberal arts, humanities, great books, and the like falling in the second category. They freely admit that this distinction omits from consideration most of what goes on in adult education, which considerably reduces its usefulness (see pp. 41-53). For other attempts to categorize aims in adult education over the past ten years, see Chapter II, "Philosophy and Issues," in *The Review of Educational Research*, Vol. XXIX, No. 3 (June, 1959). I would defend the sheer empiricism of the approach in this chapter on two grounds. One is that a book addressed generally to the improvement of methods in the field as a whole must relate its framework to the broadest possible activities in the field. Secondly, it seems to me that a fatal tendency in adult education has been toward a "premature crystallization of theory" (the phrase is Norman Maier's) which invariably isolates or rules out large segments of activity. I think we have a considerable way to go in developing as a recognizable field of education before such clear definition becomes either feasible or desirable.

12. Reprinted by permission from Robert J. Havighurst and Betty Orr, *Adult Education and Adult Needs* (Chicago: Center for the Study of Liberal Education for Adults, 1956).



SOME CRUCIAL CONDITIONS FOR LEARNING

I say moreover that you make a great, a very great mistake, if you think that psychology, being the science of the mind's laws, is something from which you can deduce definite programmes and schemes and methods of instruction for immediate classroom use. Psychology is a science, and teaching is an art; and sciences never generate arts directly out of themselves. An intermediary inventive mind must make the application, by using its originality.

WILLIAM JAMES, *Talks to Teachers on Psychology*

Definitions of subject-matter areas and educational aims on a grand scale must, sooner or later, be made realistically usable; if we have defined those aims primarily as change in behavior, then we need some assurance that adult education's resources and skills can bring about such changes. This chapter, consequently, turns from the general to the very specific act of inducing behavioral change in humans.

Most of what we do know about learning applies equally well to skills of physical action and intellectual behavior, but since our methods of teaching motor skills are far more effective than those we

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develop to teach cognitive processes, the concentration here will be on the latter. If we taught the skills of logical analysis as carefully and as well as we teach dancing and swimming, adult education's methodological problems would all be solved.

For the purposes of this chapter and the next, *cognitive behavior* means the individual's response to the flow of information coming to him through his senses, how he selects from the flow those items to which he pays attention, how he applies meaning to it, and how he manipulates it. Part of this working with the flow of stimuli coming to one's senses consists in feelings about it, for which a useful term is *sentiments*, the feeling tone associated with our beliefs and values. In very general terms, education addresses itself to the problem of changing cognitive responses and their related sentiments. It is crucial, at the outset, to investigate the conditions under which such changes are likely to occur, so that in later considerations of specific program formats and methods we can be both realistic and creative; the best way to begin is with at least a brief look at basic learning experimentation and theory.

Psychologists approach the problems of how people acquire new and appropriate responses (how they learn) with two different major assumptions which have in the past created two theoretical camps, often totally opposed to one another but at times able to find common ground in their explanations of the facts of the learning process.¹ The behaviorists, the dominant school among academic circles, stress the bonds created, in one way or another, between the repeated association of a particular stimulus with a specific response to it; one controls learning behavior largely by controlling the nature or the strength of the relation between the stimulus and the correct responses. Cognitive theorists, on the other hand, insist that individuals do not merely "respond" but that they react to and organize the information which comes to them, and that it is in this shaping of the environmental stimuli that one finds the most significant fact for learning. Consequently, they stress the control of the conditions under which stimuli are presented and whether they help the individual to make the proper organization.

SKINNER AND THE REINFORCEMENT SCHEDULE

The work of B. F. Skinner at Harvard illustrates the ideas of the first school neatly and more simply than many others, and it is par-

ticularly interesting because it is currently being applied directly to public-school classroom methods. It has the admirable simplicity of almost totally ignoring the environment and the nature of the stimulus and concentrating on the response aspect of the learning situation. Skinner starts from the principle that any live organism will tend to repeat a particular bit of behavior if that behavior has been accompanied or followed by a reward, or reinforcement. He argues, therefore, that the way to teach an organism to do anything is to wait for the random occurrence of the particular behavior you ultimately want (or arrange for it to occur), reward it immediately, and keep rewarding it until the organism performs it habitually.

One sees the meaning of this principle most clearly by watching some of Skinner's ingenious and spectacular laboratory demonstrations with animals. Thus, a pigeon in one of his cages is randomly going through its ordinary repertoire of movements—pecking, turning, and walking, as pigeons will. Skinner decides to teach it to turn around clockwise in a complete circle and waits for the pigeon to make even a slight movement in such a direction. In the course of moving about, the pigeon does turn slightly clockwise, and the experimenter immediately presses a button which operates a shutter covering the food box in the cage. The pigeon has the opportunity to eat furiously for a second or two before the shutter comes down again. The same turn, slightly more pronounced now, occurs very shortly thereafter, in confirmation of the principle, and again is immediately rewarded. The next time it comes sooner and more pronouncedly, now almost a half turn, and is again rewarded. Within a few minutes the pigeon is turning a complete circle in the desired direction and happily gorging itself at intervals in the food box.

Skinner and his enthusiastic students consider this process the model for human learning as well, although they have had some difficulty accounting adequately for many of the complexities of the human animal and the social context of his learning experience. Indeed, the recent surge of interest and activity in teaching machines developed directly from the kind of work described above. These machines, which a later chapter will consider more thoroughly, depend on three conditions: first, they present materials which have been broken into many small steps; second, they demand from the student some response, an answer to a question or the filling in of a blank in a sentence; and third, the machine itself immediately reinforces the correct response by telling the student that his response was correct. The reward consists in the pleasure of being right. The machine is a sort

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of indefatigable and unemotional tutor, constantly questioning the student and saying "correct" when he makes the appropriate response.

COGNITIVE APPROACH

As there are many different sub-schools among the behaviorists, so there are a number of cognitive theories. The important characteristic of the former is an emphasis on the role of reinforcement, of the latter an interest in learning as problem-solving and in how the individual "goes beyond the information given" in approaching a set of data or a learning task. The most widely-known early experiments within this school were those conducted with primates by Kohler. In a typical one, the experimenter hung a bunch of bananas from the ceiling of a cage, out of reach of the animal, and he also provided a few boxes carelessly disposed in the cage. The animal tried jumping for the fruit only to be frustrated; it was out of reach of any point to which he could climb as well. At some point, however, he "saw" suddenly that if he stood on one of the boxes directly under the fruit he might reach it easily, and without wasted motion he pulled the box over and got the reward.

This immediate, sudden grasp of the solution of a problem the gestaltists call *insight* and suggest that it consisted of a rearrangement of the significant elements in a situation into a successful organization. The boxes were no longer nailed-together-pieces-of-wood-for-playing-with, but things-which-if-I-stand-on-them-will-permit-me-to-reach-high. Furthermore, when the animal who had developed such a principle was put into another, slightly different problem situation, he applied the principle immediately, without going through trial and error again. What he had learned was the *principle*, he had learned it without practice, and he did it by going beyond the information given and by selecting from and giving structure to that information.

The early psychologists of the cognitive school never made much of an effort to apply their work to formal education beyond suggesting that we ought to present material to the student in a form which encourages him to find the relevant principles which organize it meaningfully. Recently several experimenters have turned seriously to the study of the process of thinking as primarily one of recognizing or forming concepts. In this view, the way in which we basically and habitually "go beyond the information given" to our senses is by

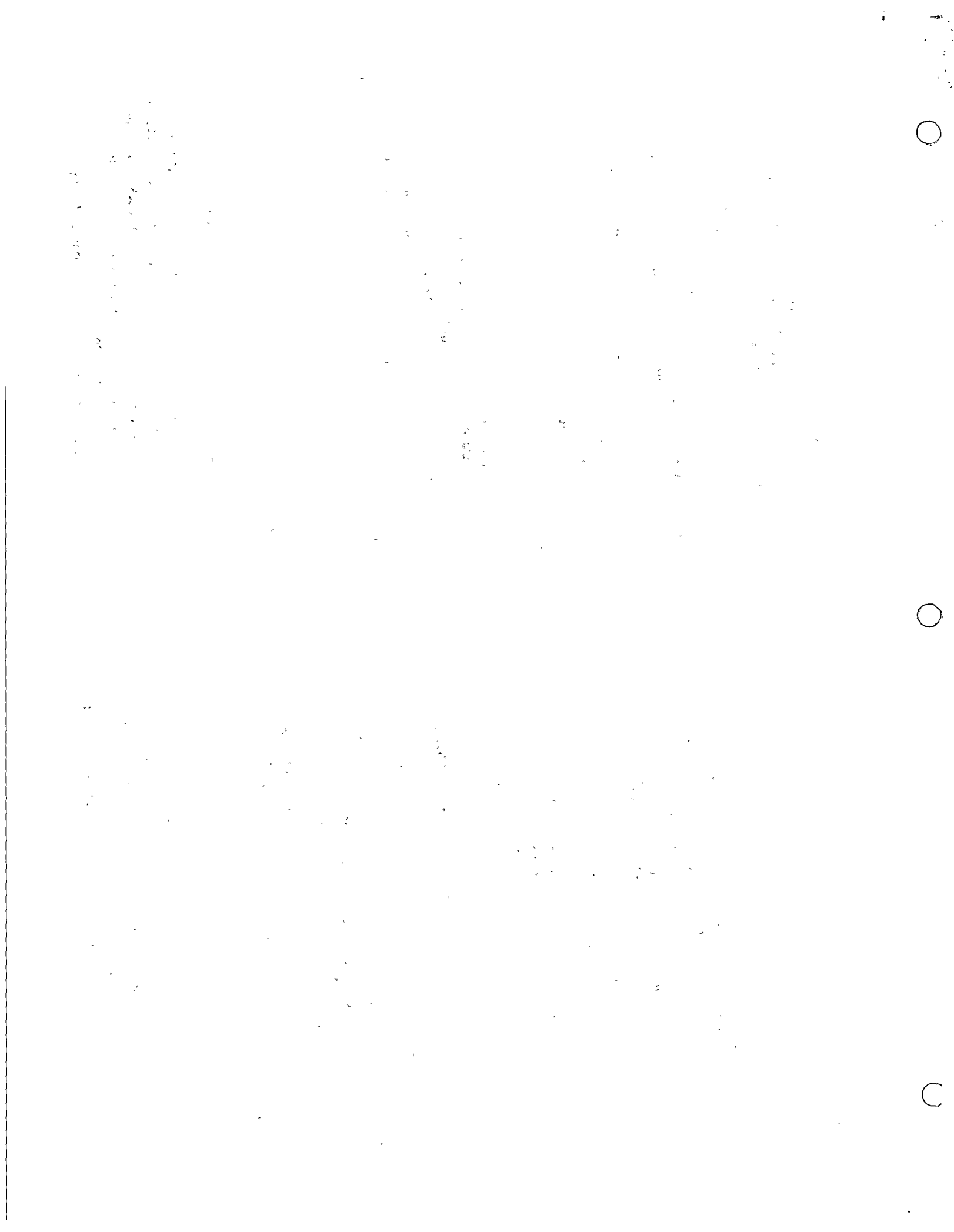
grouping them and from then on remembering and working with the group name, or concept. Every time we see an apple we do not go through the fatiguing and time-consuming process of puzzling out what it is and what it is good for; we long ago learned that most things which are red and relatively round and have a certain aroma and a particular set of indentations are to be classed in a group of phenomena called apples. From then on we can assume without further effort that when we encounter one of these objects, it will be good to eat, juicy and crisp-textured, and will have a host of other qualities.

Concepts, we may suppose, are developed at first as hypotheses; the first apple we eat encourages us to hypothesize tentatively that an object with the attributes of redness, roundness, and particular aroma will have the accompanying good effects of taste, crispness, and so on. Each time we eat another apple it either confirms the hypothesis, negates it, or changes it. We soon learn, for example, to modify the hypothesis to include the possibility that the color might be yellow.²

Though we would be unable to survive without such concepts, a difficulty, which the adult educators readily recognize, arises out of the operation of these hypotheses. The semanticists see this difficulty in the uncritical application of verbal symbols to the particular phenomenon; the therapist sees it in the unrealistic responses of the emotionally disturbed (for example, the child who operates on the hypothesis that all people are to be included in the group things-that-are-going-to-hurt-me). On the social scene we have to deal with people who, once they recognize the single attribute "critical of U.S. foreign policy," put the article or book or person immediately into the class of "communist." This approach now obviously begins to be of practical importance applied to the educational enterprise, which particularly for adults requires for success the presence of "open hypotheses" rather than "closed hypotheses."

SIX CONDITIONS FOR LEARNING

Both the behaviorist and the cognitive approaches have much to contribute to the operation of programs on a broad scale. The cognitive theorists tend in general to pay little attention to processes of acquiring and retaining information or to concepts which have already been developed, in favor of having the learner, through search, build concepts himself. But, however demonstrably better it may be to stress



methods which force the learner to discover the concept himself, few educational institutions in the society are prepared to spend the time required to do so. The approach also tends to neglect the importance of practice to the development of intellectual skills.

On the other hand, the behaviorists insist on a description of motivation in the learning process which is difficult to apply sensibly to adult learning. In their view, learning may be traced to some fundamental imbalance in the body which sets up a need; such a need-state sets the stage for learning, because its satisfaction provides the conditions of reinforcement necessary to the learning.³ It is difficult to reconcile the obvious importance of such human motives as curiosity, or what one psychologist calls the manipulation drive, with such theories, or to explain the common instances in which adults learn very complicated things indeed in only one exposure. There is some evidence for believing that the kind of learning which is described so adequately by the stimulus-response model occurs at the early stages of human development, but that at higher levels we must shift gears and adopt an explanation which is distinctly closer to the cognitive model. This, at any rate, is the view which this book proposes to take, as it draws eclectically upon whatever work in the field of learning seems useful to define below the conditions which encourage learning.

Condition 1. The Student Must Be Adequately Motivated To Change Behavior. All educational institutions concern themselves over the problem of what impels their students to learn. Learning is work, sometimes very hard work, and it looks easy only when it is either not going on at all and the students are merely being entertained, or when motivation is so high that the work involved in the learning task becomes enjoyable as well as arduous.⁴ Adult educators must worry about it on two levels: first, because theirs is a voluntary institution and people must be motivated to come in the first place, and second, because once they participate, they need motivation to change appropriate behavior.

There is no question that some of the important motivations of the first kind have little to do with a desire for learning itself. Neither, of course, do they in formal education, where the desires for social mobility, higher status, and material rewards must be very strong indeed to drive youth through the hard grind of professional school. Vocational programs for adults draw people by appealing to essentially the same motivation, but we have recognized for a long time the rather more complicated nature of the needs which people seek to satisfy by enrolling in programs in some of the other areas.

It is usually the administrator who concerns himself with such needs in the recruiting of students, but the methodologist needs to ask about them: what is their strength and what their appropriateness to the actual learning task? Motives which are strong enough to bring an individual into the learning situation may be too weak by far to keep him in it for very long or to keep him at work; the very high drop-out rate in adult programs which are not vocationally based is in part a measure of that motivation strength. By far the weakest seems to be pure intellectual curiosity, a lusting after knowledge for knowledge's sake, probably because such a motivation is relatively easily satisfied or well enough met for most people by less formal and briefer experiences.

There is a fair amount of nonsense talked about some of the other motives which lead people into adult education programs, as though these extrinsic drives were somehow dishonorable. The two most common of these probably are the need for human relationship and group belonging and the desire for status recognition. Many people appear to enroll in programs at least partially because they are lonely and want the warmth of relating to others on a level which does not threaten too much closeness. Others come in response to a wish to approximate some image they have of the intellectual, a wish arising, perhaps, out of the very real connection between schooling and upward social mobility and continually reinforced by the sham worlds created by advertising and the mass media. In both cases the motive often bears little immediate relationship to the kind of learning which the program aims at, but it serves to bring the individual into the field; whether his motives change to more appropriate ones depends at least in part on instructional skills.

Another general category of motivation is one which often seems more directly relevant than those above, but, the academic world being what it is, sometimes turns out to be just as irrelevant. Wayne Leys⁵ has described it as well as it can be:

There is another kind of interest that is not an interest in knowledge for its own sake . . . it is an interest in *rationality*. . . . I refer to the adult's desire to talk things over. This desire has been misrepresented as a desire to learn something in the ordinary sense of learning. It is not that. The adults want to clarify their thoughts, but not as scholars clarify things. They want to talk out their worries and untangle their deliberations. . . .

This motivation, too, needs to be transmuted into one more appropriate to the educational contexts in which it often appears, but such transformation requires direct, conscious effort.



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Part of the difficulty lies in the vagueness of the term *motivation* itself, which leads us often to think of it as a sort of force of nature which cannot be understood or analyzed. But one can approach it analytically and begin to deal with manageable parts of the problem. For any general learning task, for example, we might suppose that there are many identifiable psychological forces, some encouraging the student to change in relevant ways, others acting negatively either to lead him out of the field altogether or to resist change. Planners and teachers seldom have much control over the presence of positive forces, but they can do a good deal to identify and try to remove the resistant forces.⁶

In many adults resistances often take such forms as these: the student is not involved and thus is unable to see the learning task as personally important or significant; the student's objectives have little to do with the instructor's objectives—we have all known students who really are attending another class while sitting in ours; the student's fear of failure results in an unwillingness to attempt certain kinds of changes; the student may find change itself threatening, not only because he might fail in achieving the desired behavior, but because his habitual behavior is part of him and consequently valued—people tend to see any attempt to change them as an attack, which inevitably arouses defensiveness.

The presence of such resistant forces explains a great many of adult education's major problems. The vocational area is the only one in which motivational forces outside the learning field itself are strong enough to overcome the resistances within it. If instructors in the other areas do not deal adequately with the resistances, there is nothing to help them, and the group easily disintegrates or lapses into passivity. One can see, too, why adult students generally tend to prefer methods which permit them to be passive; such a state arouses none of the conflicts which may lie beneath the surface waiting to be mobilized by the challenge of real learning achievement.

The really challenging question, then, is what can be done in organizing the experience itself which will reduce the resistances to change inherent in learning. We can do some things relatively directly, for example, in both small-group and large-group situations, by making the materials as relevant as possible to the live concerns of the students, thus increasing the chance for individual involvement. The experienced adult education teacher tends to do this without much conscious effort. Or he tries to bridge the gap between his objectives

and the student's different ones by organizing activities in such a way as to increase the possibility that the student will begin to derive satisfaction from new ways of behaving before relinquishing his previous patterns. Thus, if we want people to be able to suspend judgment while carrying on critical analysis, it is possible to have them do so as part of the rules of the game and hope that some will find it rewarding in itself.

But we have available to us another resource which is often overlooked or used without much skill: the forces of the learning group itself arising out of its attractiveness for the members of the group, and the quality of their interaction. There is no question at all of the power of the group to reduce individual resistances to change if properly mobilized; but pious insistence on rituals of informality and first-name calling will not necessarily ensure its mobilization on the side of effective learning.

Two conditions at least are necessary for harnessing group forces, the first of which is that the opinion of the group as a whole must *matter* to the individuals who compose it; technically speaking, it must be a *cohesive* group. We all belong to many groups membership in which we would relinquish at the drop of a hat, and these groups have little influence on our behavior or attitudes; but we do tend to conform to the expectations of those groups which we value. Many adult education enterprises have attempted to make use of this principle, with varying success.

Often their informal groups of students achieve cohesiveness, but the emerging group goals emphasize social rather than learning tasks. Thus, the second requisite for the successful use of group forces is that the group develop shared values which are hospitable to educational change in the desired direction. One sees this process at work in the academic world in an extreme form among graduate students; the culture of the graduate department develops as a number of settled expectations about how a successful physicist or psychologist behaves and how he feels about important issues; the young graduate student senses that he had better change to conform to this image or that somehow he will never get his degree. And change he does.

One might suppose that this motivational force could only be tapped for small, face-to-face groups, but this is not necessarily so. It is possible that the audience of the early morning television programs on "Sunrise Semester," for example, have a feeling of group membership with their fellow early risers; several adult programs which use



television organize the mass audience into small, cohesive listening groups. We need to experiment with a variety of methods for making use of whatever group cohesiveness we find, whether it appears in our small groups or in mass audiences, and find ingenious ways of encouraging group adoption of values favorable to behavior change and growth.

Condition II. The Student Must Be Aware of the Inadequacy of His Present Behavior. When humans are faced with the necessity of learning a wholly new set of behaviors, they often accept it with equanimity. The child learning to walk doesn't feel badly about not knowing but plunges eagerly into the attempt to master the new skill. The adult who sets out to learn calculus for the first time is not ashamed of his ignorance—he has just never learned it before. The problem of learning new behaviors of this kind begins with an acceptance of the need to do so, requires an ability to deal with inadequacy during practice, but seldom involves any initial emotional difficulty.

But adult education, by its nature, deals much of the time with changing behavior patterns which are already organized and habitual. To say that a major condition for learning is that the student recognize the inadequacy of his present behavior is to put in particular and concrete form the problem of motivation for this kind of learning. The major resistance to change in this context is the defensiveness aroused on behalf of already established behaviors, and the fundamental requirement for success is the provision of sufficient security for the student to permit him to relax his defensive posture.⁷

We need to face squarely at some point, however, that defensiveness sometimes is realistically rooted in the incapacity of the individual for the particular achievement level which a given program has set for its students. This problem is seldom discussed in adult education circles, partly because it offends our basic democratic values to exclude some people from participation in an educational program and often because it is unpolitic to do so.⁸ The dilemma has been a chronic one for the public schools, of course, ever since schooling for all was accepted as a principle of the democratic society we claimed to be, but long and bitter experience with the problem has forced most public schoolmasters to recognize its reality and the necessity to deal with it. It is hard to escape from that reality, that substantial differences in learning capacity do exist among people and that the quality of the educational experience is affected by too wide a range of such differ-

ence. If we are unwilling or unable to screen those who come to our programs, then we somehow must provide for the presence of wide variations. It is not enough to say, as we often do, that everyone will develop according to his capacity, some more, some less, because if the level of the experience is pitched too high, the less capable might find it only a terrible frustration, and if too low, the most capable will find it boring. We must plan the activities themselves to provide rewarding experiences for both groups.

However, aside from this somewhat separate issue of individual capacity, it is clear that we must find ways of dealing with the more common defensiveness aroused by the threat of change, which appears rather differently in each of the life areas with which adult education deals. Thus, a good deal of the formal instruction for adults in the vocational area teaches new skills and consequently has to meet little defensiveness. But a growing number of programs are attempting to change established patterns: supervisory behavior, teaching methods, the attitudes of teachers. The defenses aroused here by the suggestion of inadequacy are very powerful indeed, anchored as they are in primary economic maintenance needs which are in modern society a relatively constant source of insecurity.

In programs of this kind, instructors who try the logical-sounding plan of asking people, for example, what their problems are in dealing with their subordinates may get nothing in response but a sort of bland, "Problems? Who in the world has problems?" Or he might tap an apparently inexhaustible catalog of problems having to do with the way the organization is set up, the impossible superiors one has, the laziness and incompetency of one's subordinates, and the exasperating stupidity and difficulty of one's clientele. All of which may be true, but none of these people are in the class or at the institute, and the only behavior we can readily change directly is the student's.

Instruction must be exceedingly sensitive and flexible in this kind of situation if it is to succeed in helping students to recognize their own inadequacy. Some groups are willing to do so directly, but others need to approach much more indirectly the analysis of what constitutes adequacy in their particular context. Case studies from some not-too-closely connected field might be a better start for some groups; or, if the particular instructor happens to be skilled enough, he can start by accepting the group's definition of their problem as belonging primarily to "all those other people" and help them to arrive at some insight into their own part of the problem.



In this area even instruction in the more impersonal skills is very threatening. It is easy enough to talk about the process of decision making in an objective way, but to ask a group of executives to agree that their ability to make decisions needs improving is to suggest inevitably that they are not performing their most important function well enough. Here again we may need to start at a point somewhat removed from circumstances with which they identify themselves.

Behavior in the personal and social world, and the learned meanings on which we base it, is anchored in the early developmental circumstances of the individual or to very significant events in later growth and maturity. Voting behavior can be accounted for to a considerable extent by the party affiliation of one's family; we are apt to be more suspicious of foreign nations if we grew up in one region rather than another; our settled opinions about human nature and our hypotheses about how to deal with other people form not only at early stages but in very definite forms.

Although inadequacy in this area can be just as threatening as in the world of work, the defenses against perceiving the inadequacy are somewhat different, often consisting of an unshakable conviction of our own correctness and a puzzlement over how any one could have fallen so miserably in error as those who do not see the matter our way. One has only to contemplate the difficulties of making a first approach to peoples' beliefs and sentiments about lower-class members of other nationality or skin color to appreciate the magnitude of the problem in general.

Perhaps the most important problem to be solved in helping students to see their need for change and growth in the social and interpersonal area is the inability of some instructors or lay leaders to avoid the tone of moral condemnation as they deal with beliefs and attitudes. This creates a pressure which can only lead to a stiffening of resistance. Evidence from the field of intergroup relations education suggests instead that people need to feel that their present feelings are accepted, even if not agreed with, before they can proceed to a rational examination of their consistency or their consequences.

Adult education in the arts faces much easier problems in creating this initial tension. Indeed, most people come to such programs with very conscious feelings of inadequacy; if they had not already overcome the common defense—"... but I know what I like"—they are not likely to enroll in the first place.

Arts programs tap a very powerful motivational force, however,

which other areas do not have available to them in the same sense. "Proper" behavior in this field, an interest in the fine arts, museum- and theater-going, well-expressed appreciation, and the like, are linked to upper-class status. People who aspire to social-class mobility, consequently, have little difficulty in perceiving their present inadequacy in relation to the arts because it is one of a complex of behaviors which they must adopt in order to move upward. We adopt the values of the class above in anticipation of moving into it later, beginning to change ourselves into images acceptable by those who we hope will later be our class peers.

Science programming, on the other hand, meets what constitutes almost a built-in inadequacy. If it deals with new developments in science, thus enabling it to attract the science buff, it deals with students who realize and accept readily their present inadequacies and are capable of dealing with them. If it is pitched at lower levels of competence, the students who come also accept their inadequacy cheerfully; part of the folklore of American schools is the dictum that science is difficult for all of us non-genius folks.

Condition III: The Student Must Have a Clear Picture of the Behavior Which He Is Required To Adopt. Here is the heart of the matter, for, if people do not know what kind of behavior their new learning is to result in, how can we expect them to achieve it? For adult education in particular, there are a number of problems related to the presentation of such models; some we share with all other educational fields; one at least is peculiarly ours.

PROBLEMS OF ABSTRACTNESS. Where the behavior model one is teaching is at the lowest level of abstraction, a skill involving mainly muscular coordination, for example, there is little difficulty in presenting it. Watch a golf instructor teaching a person to use a putter; he demonstrates with his own body the proper stance and the position of the head and calls his student's attention to the way he holds the club and the most effective movements of the wrist. He can, if he wishes, dispense with words altogether in presenting his model, although they help a good deal in focusing attention on its significant parts.

At a somewhat higher level of abstraction we also do a fairly good job of modeling the desirable behavior in many vocational programs. Good examples abound particularly in such business courses as insurance fundamentals, where the object is to train people new to the business. The instructor is invariably a skillful insurance salesman, and



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he knows with a considerable degree of precision what constitutes effective behavior. If an aspect of that behavior includes the ability to apply accepted principles of insurance coverage to complex individual cases, as indeed it must, he demonstrates the steps an agent goes through, pointing out the significant features of what he is doing as he goes along.

We do a consistently poor job, however, at the stratospheric levels of abstraction at which we commonly work. A sociologist giving a special course for a group of labor leaders, for example, might well be interested in increasing their awareness of the complexity of the social judgments they commonly make about events; the behavior which must be modeled here is the reflective habit of taking account of a number of social perspectives on the event, of asking how the perceptions of a variety of social groups appear to be influenced by their peculiar position in the society. But under the pressure of time and the belief that the important pedagogical task is to "cover ground," the behavior which the instructor tends to model can only be described as "ground-covering behavior."

Similarly, how many of us have observed at one time or another a psychologist telling a group of mothers with a great positiveness which barely hides a certain amount of contempt that their behavior toward their children ought to be accepting. It is hard to see where the audience can find out what "accepting behavior" looks like. The field of interpersonal relations, however, does have available to it an extraordinary resource—the film—for the purpose under discussion, and it is used by some adult educators with great skill and ingenuity.

The arts often do a very skillful job of presenting desirable models, too. The teacher who analyzes a poem before a group says, in effect, "Notice now what cues I watch for in the language and the way in which I search for meaning and relate the elements of the poem to that central meaning." One of the most significant aspects to this kind of teaching, as well as some of the best of the human relations programs, is that the model is presented *consciously* and *deliberately* as something which the student knows he is later to do himself.

It is hard to overemphasize the importance of the student's need to be sharply aware of the fact that he is now being introduced to a kind of behavior which he must later adopt, because we commonly assume that people somehow "catch" the meaning we wish them to acquire from an activity we involve them in. But there is an accumulation of evidence from a variety of sources to suggest that this is far from the

fact. The issue is one closely related to the problems of transfer of training in learning psychology: the extent to which people are able to transfer abilities learned in one context to another different context. The idea of transferability of training became somewhat disreputable after modern psychologists proved incorrect the notions of "developing mental faculties"; training in mathematics helped a person do math but had little to do with making him a more rigorous thinker in other fields.

Some more recent evidence suggests, however, that transfer is possible under conditions which encourage the formulation of some verbal generalization or principle.⁹ One need only extend the meaning of such evidence one step further to suggest that, on the highly complex cognitive level at which much of adult education operates, people must see clearly what it is precisely that they *are* supposed to be learning. The claim that adults learn about democracy, for example, merely by being involved in an activity in which they must help develop group consensus about some problem is a most unlikely one.

PROBLEMS OF COMPLEXITY. The most common difficulty, however, and the one with the most drastic consequences, is that beyond the skills of muscular coordination we seldom define our learning objectives with enough specificity to make them readily perceivable by our students. Returning to the previous example of golfing, it is easy to see that although competence consists in a mastery of a whole battery of complex skills, both instructors and students ordinarily have a clear idea of what each of the interlocking separate skills looks like. Each is therefore amenable to separate demonstration and practice at appropriate points.

Many of the cognitive changes which every one of the areas in adult education stresses in one way or another are enormously complex but seldom specified in any detail. We often undertake, for example, to improve the skills of making judgments as though this were a unitary behavior, when, in fact, it involves at least these very different ones: (1) an awareness of our own prejudices, values, and psychological sets involved in the particular issue about which we are to make the judgment; (2) the ability to control these at least to the extent of temporarily suspending their full play; (3) a range of skills involved in assessing the validity and reliability of evidence bearing on the issue; and (4) an ability to discriminate among the various elements involved in the issue in order to sort them into categories of their significance to the issue. Faced with such a complex series of be-



haviors, there is little reason to wonder why so few courses or programs succeed to any significant extent in showing improvement in their students. The next chapter will attempt to take the most common cognitive models in adult education and analyze them into the specific sub-behaviors which compose them.

THE PROBLEM OF VEHICLE. The question of how we should present the behavior model still remains, and it is one that provides some problems peculiar to adult education. The captive, docile pupil of primary and secondary schools and the competitive, highly motivated student in both undergraduate and graduate programs can be induced to do a great deal of concentrated work at something which he does not at the time see as particularly relevant. The adult student, except those enrolled in regular undergraduate university programs for remedial reasons, insists on immediately relevant activity. "If the program deals with international affairs, why aren't we discussing these affairs," he is likely to demand. "It's a free country and everyone is entitled to his own opinion, so let's just express them." We can seldom induce him to read much, carefully and analytically, because his participation is almost always a peripheral part of a busy life.

Recognition of such a state of affairs leaves us with little recourse but to use meeting time for the important business of presenting models or of helping the group develop them through rigorously controlled discussion. Fortunately, the range of pedagogical techniques for such an activity is wide; demonstration, role play, and case analysis, supplemented by lectures or controlled group discussion, can be adapted for a great variety of adult education formats, and for even such a remote relation as the correspondent student the techniques of the teaching machine are useful and relevant to this problem.

Condition IV. The Student Must Have Opportunities To Practice the Appropriate Behavior. It is remarkable that a principle so generally recognized in many fields of commonplace learning should be so often ignored in more formal educational contexts. Any observer of a wide range of adult programs, however, must conclude that in many cases it is the instructor or leader who is practicing the behavior which he wishes to get the student to adopt, rather than the student, who presumably is the one who needs it.

Part of the difficulty, of course, is time. Adults are often unwilling to practice on their own, generally speaking, and it is often exasperating to go through the slow process of working through exercises or examples in periods set aside for contributions from often expensive

instructional talent. But practice is so crucial that we must begin to apply ingenuity to the solution of this problem, perhaps, as later chapters will suggest, by developing special kinds of material and by modifying some types of group activities already generally in use in adult education.

Furthermore, the concept of practice, once we go beyond the simple and obvious examples such as running a machine or learning to play golf, must involve the student in an active search for meaning. As Getzels¹⁰ points out:

Search for meaning may entail a period of fumbling akin to the so-called blind or random trial-and-error behavior. Present theories, however, hold that if the learner is truly searching for understanding in the problem situation and not only rote remembrance of steps in the solution, his apparent trial and error is not random and certainly not *blind*. He is making a real "try" for the solution and is not going through just any behavior of which he is capable. The try is the best hypothesis the learner is able to make at this particular time, and the instructor should not treat it with disdain—even when the hypothesis is wrong.

Thus, the student needs to have time and the opportunity to make mistakes as well as time to work through the behavior model correctly, which further complicates the difficulty cited earlier. Whatever the problems, however, the basic issue remains clear and emphatic: If we are interested in having the student learn, he must be *active* in some appropriate fashion; he must have the opportunity to do what he is supposed to learn to do.

Condition V. The Student Must Get Reinforcement of the Correct Behavior. During the course of practice the student must get feedback as continuously as possible about his progress. All theories of learning tend to subscribe to the idea that report on one's progress is necessary to continued motivation toward a learning goal and that reinforcement of the correct behavior increases the chances for its reappearance at a later point. Reinforcement, as a technical term, arose as a substitute for the idea of "reward," and, fortunately, we have available a range of psychological rewards to substitute for the grain and bananas of the animal experimenters.

Given an adequate level of motivation, both children and adults accept the knowledge of being correct as reinforcing. Indeed, without indulging in theoretical flights into the other-directedness of our culture, one might almost view with alarm the extent to which this can be demonstrated to be true. Recent studies, for example, create a situa-



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tion in which the subject, sitting opposite the experimenter, is asked to talk about some personal experiences. If the experimenter, at well-defined intervals, nods his head, the subject keeps going; if, after a time, the experimenter stops nodding altogether, the subject tends to peter out and stop; the talking response is simply extinguished. All teachers, of course, are aware of how useful the nod is as feedback to a student that what he has said is correct; few of us, however, are aware of how necessary it is to provide some form of consistent reinforcement.

Condition VI. The Student Must Have Available a Sequence of Appropriate Materials. Here is a principle which bears with particular force on the education of adults because we too often tend merely to import materials from other educational contexts without regard to the particular needs of the adult student. Many adult programs use instructional help from the high school and the university, and the instructor is apt to bring with him the materials he is most familiar with. The university teacher in particular often assigns to a group of adults with a wide range of capabilities and personal objectives a most fantastic series of readings, inappropriate in both difficulty and quantity, apparently under the delusion that because they are mature one ought to treat them as graduate students. The most satisfactory development of materials, not surprisingly, has been done by agencies whose programs eliminate the trained teacher; the extraordinarily careful compilations of political readings and cases developed by the Foundation for Continuing Education is a case in point.

The need for intellectual appropriateness of material requires some amplification. The fault lies, often enough, not only in the assignment of impossible amounts of difficult reading material but in the failure to make clear to the student what the purpose of the reading is, what its relationship is to learning goals which he can comprehend and find personally meaningful. Some programs which have troubled to work through courses specifically for adults have, for an opposite example, re-developed the old method of *explication des textes* in a most satisfactory way.¹¹ The students read aloud in the group a difficult text and discuss, sentence by sentence, if necessary, the author's intention, the precise shades of meaning, and the structure of the idea or argument he is building. This process does not substitute for the broader discussion of the ideas of a particular writer, but it is excellent training in the several basic disciplines necessary and preliminary to good general discussion.

NOTES

1. The division of learning theorists into two camps is, of course, somewhat oversimplified, but it is a useful distinction often adopted in the literature. The reader interested in some further exploration might try Roby Kidd's recent *How Adults Learn* (New York: Association Press, 1959); the more serious student of adult education will find Hilgard a most useful introduction to the tangled world of learning theory [E. R. Hilgard, *Theories of Learning* (New York: Appleton-Century-Crofts, 1956)]. As I have tried to make clear in the text, it seems to me undeniable that the work on cognition has far more meaning for adult educators than the stimulus-response systems, and I suggest, therefore, Scheerer's very well-organized review of learning theory from the point of view of the cognitive theorists: M. Scheerer, "Cognitive Theory," in Lindzey's *Handbook of Social Psychology*, Vol. I (Reading: Addison-Wesley, 1954), pp. 91-142.

2. The view of the thinking process as essentially one of the categorization of sensory data is as old as the Greeks, but until recently the process was surprisingly little studied by modern psychologists. Bruner and his associates at Harvard revitalized the area in a five-year study of concept formation characterized by an exceptional ingenuity. Some of the findings of that study are cited in Chapter 3. Bruner went on to suggest applications to public-school education in a report he wrote of a conference on science education, a small book which has had more sudden impact on the thinking of public school people than any other I have ever seen. See J. S. Bruner, J. J. Goodnow, and George A. Austin, *A Study of Thinking* (New York: John Wiley, 1956); J. S. Bruner, *The Process of Education* (Cambridge: Harvard University Press, 1961). Also: E. C. Tolman, "Cognitive Maps in Rats and Men," *Psychological Review*, Vol. LV, No. 4 (1948).

3. One of the sharp areas of disagreement in learning theory is still the question of whether or not it must depend, directly or indirectly, on drive-reduction. The case for the irrelevance of such a theory for adult learning is made bitingly by Harlow: "There are logical reasons why a drive-reduction theory of learning, a theory which emphasizes the role of internal, physiological-state motivation, is entirely untenable as a motivational theory of learning. The internal drives are cyclical and operate, certainly at any effective level of intensity, for only a brief fraction of any organism's waking life. The classical hunger drive, physiologically defined, ceases almost as soon as food—or nonfood—is ingested. This, as far as we know, is the only case in which a single swallow portends anything of importance. The temporal brevity of operation of the internal drive states obviously offers a minimal opportunity for conditioning and maximal opportunity for extinction. The human being, at least in the continental United States, may go for days or even years without ever experiencing true hunger and thirst. If his complex conditioned responses were dependent upon primary drive reduction, one would expect him to regress rapidly to a state of tuitional oblivion. There are, of course, certain recurrent physiological drive states that are maintained in the adult. But the studies of Kinsey indicate that in the case of one of these there is an inverse correlation between presumed drive strength and scope and breadth of learning, and in spite of the alleged reading habits of the American public, it is hard to believe that the other is our

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The second part of the document focuses on the specific procedures and standards that must be followed during the audit process. This includes the selection of samples, the use of audit trails, and the documentation of findings.

The third part of the document addresses the challenges faced by auditors in the current business environment, such as the increasing complexity of transactions and the need for continuous professional development.

The final part of the document provides a summary of the key points discussed and offers recommendations for improving the audit process and enhancing the reliability of financial reporting.



major source of intellectual support. . . ." Harry F. Harlow, "Mice, Monkeys, Men, and Motives," *Psychological Review*, Vol. LX, No. 1 (1953), p. 25.

4. Harlow, in the same article cited in the previous note, points out that "there was as much evidence to indicate that a strong drive state inhibits learning as to indicate that it facilitates learning," and there is a fair amount of support for his opinion in the literature generally. The consequences of very strong drive states appear to be, as one would guess, a focusing and narrowing of interest to the particular satisfier of the drive and a neglect of every other feature of the field. It would not be too far off the track to suggest that an adult education analogue might be concentration of the adult degree student in business education on those courses which are relevant to the degree he needs and his impatience with what he often sees as the humanistic "frills."

5. Wayne A. R. Leys, "The Two Roles of the University in Adult Education," *Journal of Higher Education*, XXVI (January, 1955).

6. The approach and the terminology here are recognizably Kurt Lewin's conception of the force field. This view might suggest that we approach the adult student's motivation as a field of both positive psychological forces moving him toward the learning goal and negative ones taking the form of various resistances. The option of attempting to increase the force of the positive vectors, one we tend usually to take, often results only in increasing the opposing forces. Lewin's analysis, instead, leads one to try to remove the resistances.

The whole problem of the adult student's motivation, I am convinced, has been so far treated most superficially and needs re-examination in the light of somewhat more complex conceptions. Murphy's discussion of the affect of the early canalization of fairly broad drives deserves some study, for example, and even more so do McClelland's studies of the achievement motivation. As a field we tend to be about a generation behind the available body of information and theory relevant to our purposes in the behavioral sciences. See D. C. McClelland, *The Achieving Society* (New York: Van Nostrand, 1961); G. Murphy, *Personality* (New York: Harper, 1947); K. Lewin, *Resolving Social Conflicts* (New York: Harper, 1948).

7. For a discussion of this problem with specific reference to the training of adults, see L. Bradford and P. Sheats, "Complacency Shock as a Pre-requisite to Training," *Sociarty*, 2:1, 2:38-48 (April, August, 1948).

8. The difficulty adult education programs have in setting up any sort of screening procedures arises from two sources: one is the financial necessity of getting as many students as we can for a program which must pay for itself; the other is the political embarrassment of asking sponsoring or cooperating organizations to screen their own members. So, we almost never introduce screening devices. Neither do the public schools, because by law they must accept all comers; but once the schools get their heterogeneous population, they proceed to recognize pedagogical realities by devising a wide variety of groupings to prevent the ability range from getting too unmanageable. In our case, it does not seem to me a necessary part of the democratic dogma to insist that somewhat dull-normal individuals be forced or lured into situations of intellectual demand which their own pride prevents them from leaving and in which they are miserable.

We should not confuse this issue of individual differences in what is essentially a verbal or conceptual capacity with the old argument about whether

adults can learn or not. Though we know better, we often talk as though people learned only in special kinds of situations, and as though the rest of the time they were static dischargers of previous learnings. For years we defensively used the work of Thorndike in the thirties to *prove* that adults can learn, as though it were a momentous discovery to find that adults were able to commit nonsense syllables to memory almost as fast as a child can! The rapidity with which any normal adult on a new job learns the subtle and complex informal social systems of the new group to which he comes, a task which a social psychologist may spend weeks on; the ease with which we learn our way around a new town, both geographically and socially; the amount of information which the sports buff integrates and retains comfortably, on *one* reading, every time he reads a sports page; the concepts gained and the slight shifts in attitude arising from a talk with a stranger on a bus, a shopping trip, a movie, a family crisis—people do not move through such experiences without drawing conclusions, making generalizations, reaffirming or rejecting previously-held opinions, and storing and integrating relatively large amounts of information.

To ask the question *whether* adults learn, consequently, seems to me nonsensical. We do need, however, to ask what kind of facility with the special world of verbal symbol systems our particular program demands and to deal realistically, either before admission or after, with the corresponding range of ability of the students.

A symposium on adult learning sponsored by Syracuse University in the fall of 1962 focused a variety of contemporary views on the issues of the adult's capacity to learn, motivation, and similar topics. The conference papers will soon be available from University College of Syracuse University.

9. The professional reader interested in the problem of transfer should look at George Katona's classic study, *Organizing and Memorizing* (New York: Columbia University Press, 1940), and E. R. Hilgard's survey of learning theory cited previously. Hilgard and his colleagues did some follow-up work on Katona's experiments which introduces some notes of caution: see, for example, their article, E. R. Hilgard, R. D. Edgren, and R. P. Irvine, "Errors in Transfer Following Learning with Understanding," *Journal of Experimental Psychology*, Vol. 47, No. 6 (June, 1954). The optimistic view of this chapter toward the generalizability of learning is based on such relatively recent work as that reported in D. H. Lawrence and J. DeRivera, "Evidence for Relational Transposition," *Journal of Comparative and Physiological Psychology*, Vol. XLVII (1954), and particularly on Harlow's work with monkeys reported in "The Formation of Learning Sets," *Psychology Review*, Vol. LVI (January, 1949). The suggestion that in humans such transfer of learning is facilitated by the ability to make verbal formulation of the principle can be held only tentatively in view of such evidence as that in H. S. Stevenson, Ira Iscoe, and Claudia McConnell, "A Developmental Study of Transposition," *Journal of Experimental Psychology*, Vol. XLIX, No. 4 (April, 1955).

10. J. W. Getzels, *Learning Theory and Classroom Practice in Adult Education* (Syracuse: Syracuse University: University College, 1956), p. 5.

11. Galway Kinnel, *The Basic Program at Chicago, Notes and Essays No 11* (Chicago: Center for the Study of Liberal Education for Adults, 1955).

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Lesson 1

THE FORMATION OF CLOUDS

Objectives

At the end of this lesson you should be able to

- list the major gaseous constituents of the atmosphere.
- describe the concept of air pressure.
- describe the principle of the mercury and aneroid barometers.
- calculate relative humidities from the tables provided.
- describe the condensation processes within a cloud.
- perform the fog bottle experiment.
- list the mechanisms involved in cooling air to saturation.
- identify the criteria for classifying clouds.

Of all the weather elements, clouds and precipitation are the most obvious. For this reason we will begin our study of the weather with a discussion of the formation of clouds. Over the centuries that man has studied weather, certain physical factors have been found to be basic to weather conditions and weather changes. In this chapter, we will first examine the composition of air, then the concept of air pressure, and finally the relationship between air pressure and air temperature. Emphasis will be placed on the importance of water in the atmosphere. Since water can exist as a vapor, liquid, or solid in our atmosphere, we will delineate the conditions necessary for a particular state to exist and the meteorological consequences of the change from one state to another. In particular,

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we will consider the natural processes involved in the cooling of air to cause condensation of water vapor and produce clouds, and will discuss the various types of fogs and clouds.

A. THE COMPOSITION OF AIR

The Greeks gave meteorology its name. The Greek word meteora refers to phenomena in the air, but meteorology is a study of only some of the things in the air. (In certain references the term hydrometeor is used to describe the state or effect of the three physical phases of water--solid, liquid, or vapor--in the atmosphere or at the earth's surface, that is, clouds, fog, rain, snow, and ice crystals.) The Greeks, who believed earth, air, fire, and water to be the four fundamental elements in the universe, never recognized that air is, in reality, a mixture* of various gases. Today we know that there is no such thing as a molecule* of air. Air, in fact, is primarily a mixture of nitrogen, oxygen, carbon dioxide, and monatomic argon molecules. It is important, in what follows, to recognize this molecular composition of the atmosphere. Each constituent of the mixture acts independently of the others. This mixture, which tends to be relatively constant in its proportions in the lower layers of the atmosphere, is called dry air. However, in these lowest layers, water is also a small, but extremely significant, constituent.

Mixture: A material composed of two or more substances, each of which retains its own characteristic properties.

Not until almost 2000 years after the Greeks introduced meteorology were scientists able to isolate the gaseous constituents of the atmosphere. Ironically, the least abundant gas, carbon dioxide, was isolated first. Joseph Black of Scotland discovered carbon dioxide in the air in 1756. In any given volume of dry air, carbon dioxide comprises only 0.03% by volume. The most abundant gas, nitrogen, was discovered next by an Englishman, Daniel Rutherford, in 1772; it comprises 78% of a volume of dry air. Meteorologically, nitrogen is of interest

*Words followed by an asterisk are defined in the Glossary.

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only for the role it plays in forming the earth's ionosphere* and in the production of auroral light*. Oxygen, which constitutes about 21% of air by volume, was discovered by Joseph Priestley in 1774. This gas is important in most biological activities. Argon, discovered 120 years later, in 1894, by Lord Rayleigh (John W. Strutt) and William Ramsay, comprises less than 1% of the total volume of dry air. Table 1.1 lists the various constituents of dry air and shows their relative abundance by volume.

<p><u>Ionosphere:</u> A region of the atmosphere from about 50 to about 250 miles above the earth's surface.</p>
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Table 1.1

COMPOSITION OF DRY AIR BELOW 50 MILES

(by volume)

Nitrogen	78%
Oxygen	21%
Argon	1%
Carbon dioxide	0.03%

The particular mixture of gases given in Table 1.1 exists only within the first 50 miles of the earth's atmosphere. Above this level, air consists mainly of monatomic oxygen, hydrogen, and helium, as a result of complex photochemical reactions induced by radiation from the sun. By far the most important gas found in air, from the meteorological viewpoint, is water vapor, which may vary from 0 to volume percentages close to 4%. Approximately 99% of all atmospheric water vapor is found below an altitude of 6 miles (see Weather,¹ pages 34-36). Water vapor* not only is important as the raw material for clouds and precipitation but also acts to regulate the atmospheric temperature via the greenhouse effect. (The greenhouse effect will be discussed later in this lesson.)

B. AIR PRESSURE

Within the atmosphere, the mixture of gases is in a constant state of agitation. (Each molecule has a mass depending on its atomic structure and is moving about at great speeds.) This molecular motion exhibits itself as a force

¹ See the Golden Science Guide, Weather--A Guide to Phenomena and Forecasts.

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against any surface. In a parcel of air the billions of molecules, with different masses and speeds, collide with each other and with any surface with which they come into contact. These billions of impacts exert force on objects in the air, such as dust, and on surfaces. Force on a given surface is the total of impacts over the whole surface. For convenience in measurements and calculations it is better to use the idea of pressure,* that is, the total force divided by the total area. This concept is expressed mathematically as

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}} .$$

By definition, pressure is the force per unit area.

Pressure may be given in pounds per square inch ($\frac{\text{lbs}}{\text{sq in}}$) or kilograms per square meters ($\frac{\text{kg}}{\text{sq m}}$) or grams per square centimeter ($\frac{\text{g}}{\text{sq cm}}$).

The bombardment of the air molecules against the surface of the earth is the result of the gravitational attraction of the earth on the molecules of the air. In terms of a hypothetical column of air over a point on the earth's surface, this bombardment is considered to be the weight of the total air column. Molecules of the atmospheric gases, being attracted earthward, create a net pressure of approximately 15 lbs on every square inch at the surface of the earth. In other words, the atmospheric pressure at the earth's surface represents the weight of an entire column of air with a cross-sectional area of 1 sq in. Because the gas molecules are moving in all directions--up, down, sideways, back and forth--the atmospheric pressure will be the same on any exposed surface, no matter how the surface is oriented with respect to the ground. If the surface is elevated farther and farther above the ground, it will be exposed to lower and lower pressures as a consequence of having to support a smaller column of atmosphere above it.

Two examples can illustrate the presence of atmospheric pressure.

First, consider the molecular impacts on an empty cardboard box, as illustrated in Figure 1.1. When the action of the molecules in the air is the

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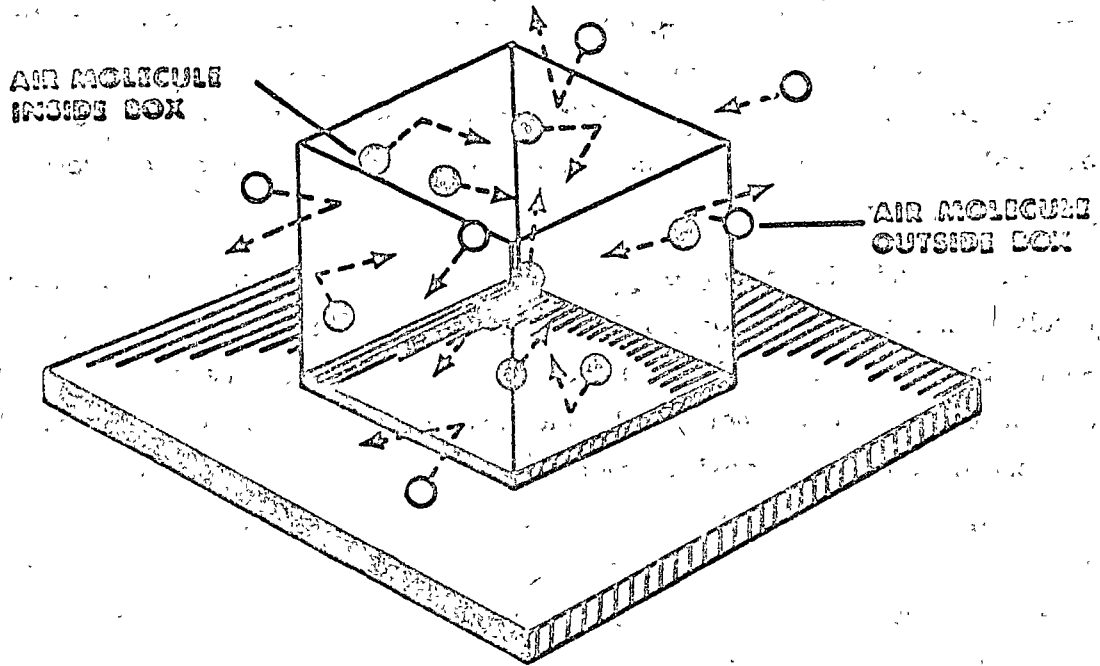


Figure 1.1 Molecular impacts on box

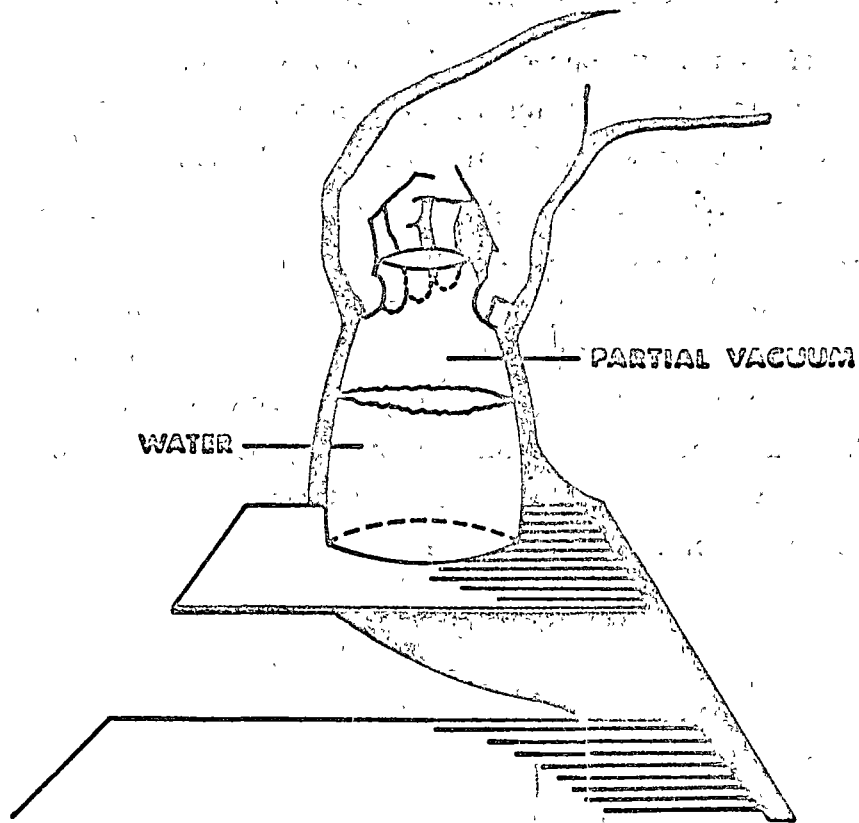


Figure 1.2 Inverted glass partially filled with water

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same both in the box and outside it, the impacts cancel each other out, preventing either the inward or the outward collapse of the box. If, however, a pressure difference exists between the inside and the outside, the box will either explode outward or collapse inward, depending on which side of the wall receives the greatest impacts.

A second illustration of the effect of molecular impact in the atmosphere involves use of a piece of cardboard and a glass partially filled with water, as shown in Figure 1.2. If you place the cardboard over the top of the glass and then invert the glass, holding the cardboard in position, you will find that the cardboard remains in position when you remove your hand. When the glass is inverted, a partial vacuum is created in the air between the bottom of the glass and the top of the water surface within it. The molecular impacts on the underside of the cardboard are sufficient in this case to support the water, which may weigh at least a half pound. The pressure of the air trapped in the glass is less than the pressure of the atmosphere outside acting on the cardboard. Thus, the atmosphere can support a column of water in a glass.

Most of us rarely appreciate the many ways in which air pressure works for us. For example, even the simple act of sucking soda through a straw would be impossible if it were not for the fact that air has weight. When drawing the air from a straw, we create a partial vacuum, or a pressure reduction, inside the straw. The full weight of air pressing on the fluid in the glass or bottle (see Figure 1.3) exerts a pressure greater than that inside the straw. Then, as a result of the pressure difference between the inside and outside of the straw, the fluid is forced toward the lower pressure region in the straw and then into the mouth. As in the case of the water pump described below, the pressure of the air on the water surface is transmitted through the fluid, which must move toward the region of lowest pressure.

The Barometer

The device used to measure atmospheric pressure, the barometer, is based on the concepts we have just illustrated.

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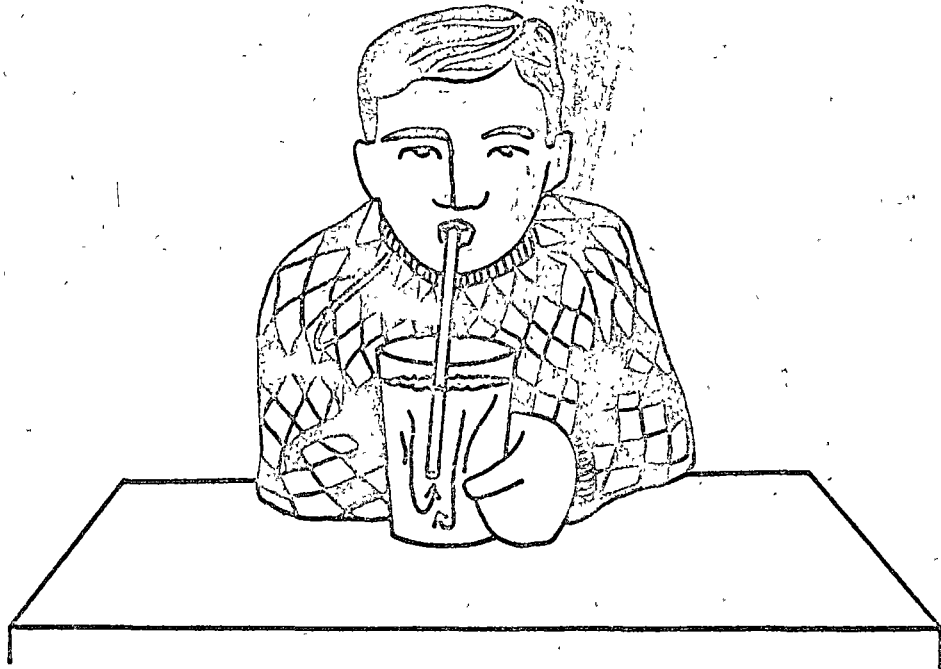


Figure 1.3 Drawing on a straw.

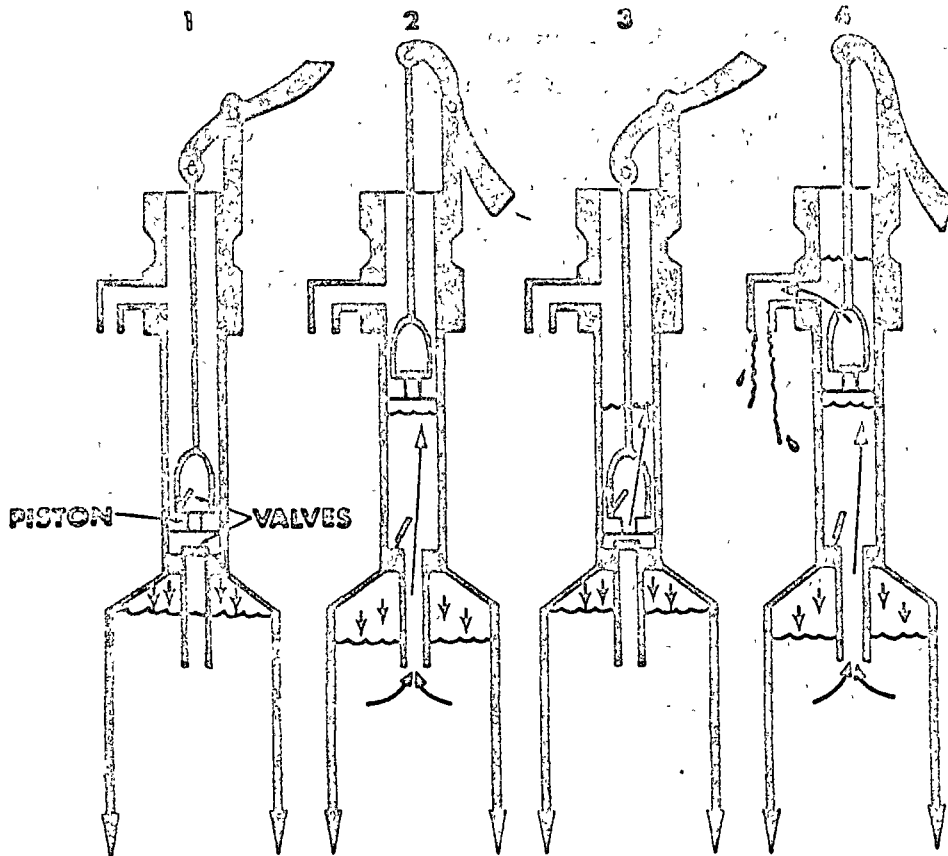


Figure 1.4 Lift pump

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In the 17th century, Europeans recognized a problem with the water-lift pumps in their wells. People were puzzled to learn that if they dug a well in which the surface of the water was greater than 34 ft below the lift pump, the pump would not bring up the water. An Italian natural philosopher, Evangelista Torricelli, concerned himself with this phenomenon; he concluded that air had weight and that the pressure of the surrounding air had forced the water up into the pipe of the pump. He had experimented with columns of mercury (a liquid element about 14 times as heavy as water) and had shown that the weight of the atmosphere supports a column of mercury 30 in. high, or a column of water 34 ft high, and no higher.

A lift pump, illustrated in Figure 1.4, contains an enclosed piston which is moved up and down in a cylinder by a pump handle. Upward motion of the piston causes small valves in the piston and at the bottom of the cylinder to open. A partial vacuum in the water pipe is created in the initial upward action, because the total volume in the cylinder has been increased without additional air inflow. As a result, the pressure inside the cylinder is less than the atmospheric pressure on the well water, causing water to be forced upward into the cylinder to fill the void. Water in the cylinder cannot flow back down because the lower valve closes on the downward motion of the piston. Thus the water in the well, acted upon by the full pressure of the atmosphere, is forced upward by the pressure differences between the top and the bottom of the cylinder. Since the normal pressure of the atmosphere is sufficient to support only a 34 ft column of water, a single lift pump could not draw water from a well deeper than 34 ft.

A result of Torricelli's investigation of the problem of pumping water was the invention, in 1642, of the barometer. The barometer is the instrument used to measure the weight of the atmosphere--that is, the pressure exerted by the atmosphere. In fact, the word barometer is derived from the Greek root baros, meaning weight or pressure; hence a "weight meter."

The Torricelli barometer, illustrated in Figure 1.5, consists simply of a narrow glass tube, about 36 in. long, enclosed at one end. The tube, filled with mercury, is inverted and placed in a dish of mercury. The level of mercury in the tube falls until the air pressure on the surface of the mercury in the dish

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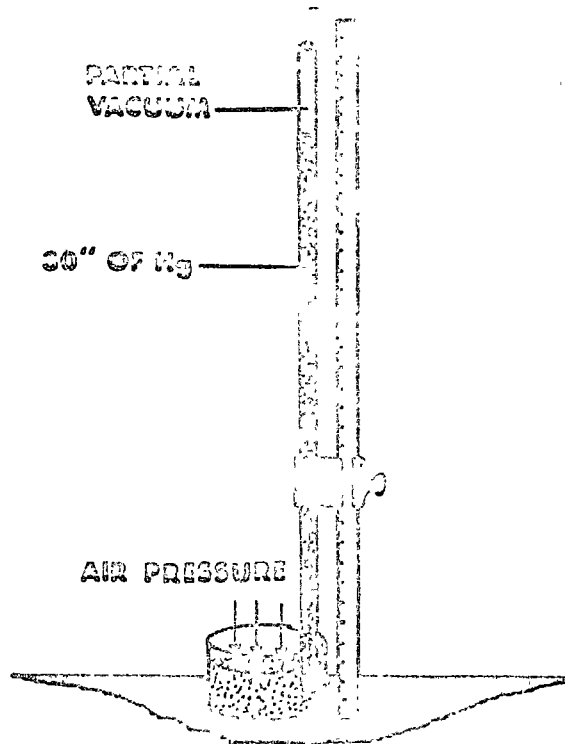


Figure 1.5 Torricelli mercury barometer showing sea-level pressure (30 in. of mercury)

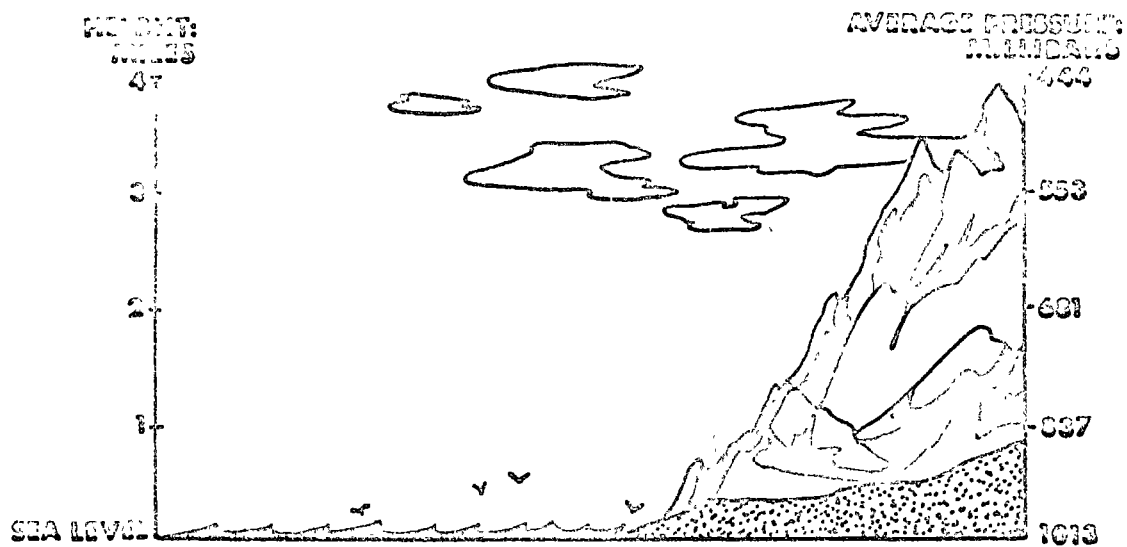


Figure 1.6 Decrease in pressure with increase in elevation

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supports the column of mercury in the tube at a level of about 30 in. It can support no greater weight of mercury than this, and the space in the tube above the liquid is a vacuum. The diameter of the tube is immaterial as long as the exposed surface area of the mercury in the dish is sufficiently large--that is, is greater than the area of the tube. The total atmospheric force exerted on the exposed surface area balances the weight of the column of mercury, once the final weight has been attained. As atmospheric pressure increases, the mercury in the tube will rise; as pressure decreases, the mercury falls. Thus the height of mercury in the tube reflects the pressure in the atmosphere and its variations.

Although you could perform this experiment easily at home, the price of the several pounds of mercury that would be required is prohibitive. It is possible to construct a barometer using water instead of mercury, but since the atmosphere supports 34 ft of water, the tube would have to be 34 ft long--a highly inconvenient means of measuring atmospheric pressure.

Other Europeans experimenting with Torricelli's barometer observed that pressure changes are related to weather changes. They noted that the weather was generally fair when the column of liquid rose, but that the column sank when the weather was stormy.

In 1648 Pascal had a Torricellian barometer carried to the top of Puy de Dome in southern France. At the top of the mountain the mercury column was found to be about 3 in. shorter than it was at the base of the mountain.

The mercury barometer officially used by the National Weather Service today is essentially the same as Torricelli's device. The only differences are a more precise measuring scale and a much more sophisticated mercury reservoir.

Units of Pressure

It should now be clear what the weatherman means when he tells us that the pressure is 29.58 in. of mercury and rising. The worldwide range of pressure change is only approximately 6 in. of mercury. The lowest reading of pressure ever observed was 25.9 in. of mercury, recorded in the eye of a typhoon in the Pacific Ocean. The highest pressure ever recorded, just over 32 in. of mercury, was observed in the cold, wintertime interior of Siberia.

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In scientific work, pressure is rarely measured using a scale graduated in inches of mercury. Using metric units of length, the chemist and the physicist generally measure the height of the mercury column in centimeters or millimeters of mercury. Sea-level pressure is roughly 760 mm of mercury (where 25.4 mm = 1 in.). Since these units of pressure measurement are direct measures of the height of the mercury column, they are dependent upon volume changes in the mercury in the tube due to changes in temperature. Thus temperature corrections must be made to achieve an accurate pressure reading. A measurement of atmospheric pressure that employs the concept of force and is independent of the properties of any substance was developed by meteorologists and is almost universally used. It is the millibar scale for the measure of pressure. A millibar* (mb) represents a certain unit force applied to a unit area. Normal sea-level pressure is about 1013 mb. Therefore, 1 in. of mercury is equivalent to 33.86 mb (see Table 1.2).

Table 1.2

SCALES OF PRESSURE MEASUREMENT

Ways of Indicating Pressure

1. <u>Measure of a column of liquid</u>	2. <u>Direct measure</u> ^b		
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> <p style="text-align: center;"><u>Mercury (Hg)</u></p> <p>1 standard atmosphere of pressure = 29 in. of Hg (English units)</p> <p style="text-align: center;">or</p> <p>760 mm (760 torr^a) of Hg (metric units)</p> </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> <p style="text-align: center;"><u>Water (H₂O)</u></p> <p>1 standard atmosphere of pressure = 34 ft of H₂O</p> </td> </tr> </table>	<p style="text-align: center;"><u>Mercury (Hg)</u></p> <p>1 standard atmosphere of pressure = 29 in. of Hg (English units)</p> <p style="text-align: center;">or</p> <p>760 mm (760 torr^a) of Hg (metric units)</p>	<p style="text-align: center;"><u>Water (H₂O)</u></p> <p>1 standard atmosphere of pressure = 34 ft of H₂O</p>	<p>1 standard atmosphere of pressure = 15 lb per sq in. (English units)</p> <p style="text-align: center;">or</p> <p>1013 mb (metric units)</p>
<p style="text-align: center;"><u>Mercury (Hg)</u></p> <p>1 standard atmosphere of pressure = 29 in. of Hg (English units)</p> <p style="text-align: center;">or</p> <p>760 mm (760 torr^a) of Hg (metric units)</p>	<p style="text-align: center;"><u>Water (H₂O)</u></p> <p>1 standard atmosphere of pressure = 34 ft of H₂O</p>		

a. A torr is named for Torricelli, the inventor of the mercury barometer.

b. Direct measure is a theoretical concept; it is derived by converting the height of mercury to millibars at a certain temperature.

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The worldwide range of pressure in metric units is about 200 mb. The highest pressure ever reported in the United States was 1063.3 mb (31.4 in. of mercury), recorded at Helena, Montana, on January 9, 1962.

Barometer readings at any given station must be corrected to insure that all stations read essentially the same property of the air. Only in this way can pressures at different weather stations be meaningfully compared. The two main corrections are (1) the room temperature correction and (2) the sea-level correction. Correction for room temperature (which gives us station pressure*) is necessary because the temperature of the room in which the mercury barometer is located affects the level of the mercury. In a warm room the mercury expands slightly and indicates a higher pressure than would be shown by a barometer in a cold room, where the mercury tends to contract. Correction for sea level (sea-level pressure*) is necessary because elevation affects the barometer reading, as is illustrated in Figure 1.6. A barometer at a mountain station such as Denver, Colorado, would always show a lower reading than a barometer at Lincoln, Nebraska, because the difference in elevation of these two cities is nearly 4000 ft. The mountain station reading is lower because at higher elevations the number of molecules in the air is less than at sea level, where the weight of a deeper column of the atmosphere must be supported. The difference can be compared to that between the weight of sea water when measured on a scale immersed just beneath the ocean surface and when the reading is made near the bottom of the ocean. Obviously, there is much more water over the scale near the bottom than just beneath the surface.

To avoid always finding low pressure over the mountains and high pressure over stations near sea level, meteorologists correct their barometers assuming that the atmospheric column extends down to sea level. The weight of this imaginary mass of air is added to the observed station pressure to arrive at the corrected sea-level pressure. This adjustment to correct for station elevation assures that, for the most part, the pressure variations we observe indicate weather changes and not merely elevation differences.

The Aneroid Barometer. Another type of barometer found frequently in homes and offices is the aneroid barometer, illustrated in Figure 1.7. This device contains a partially evacuated, corrugated metal can that expands or

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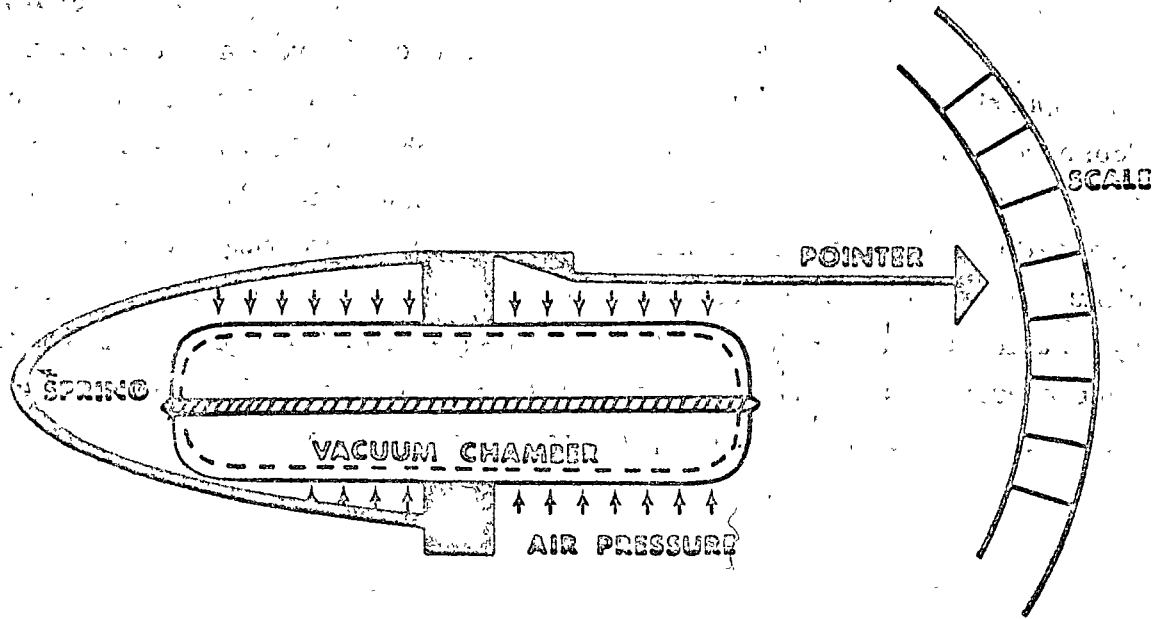


Figure 1.7 The aneroid barometer

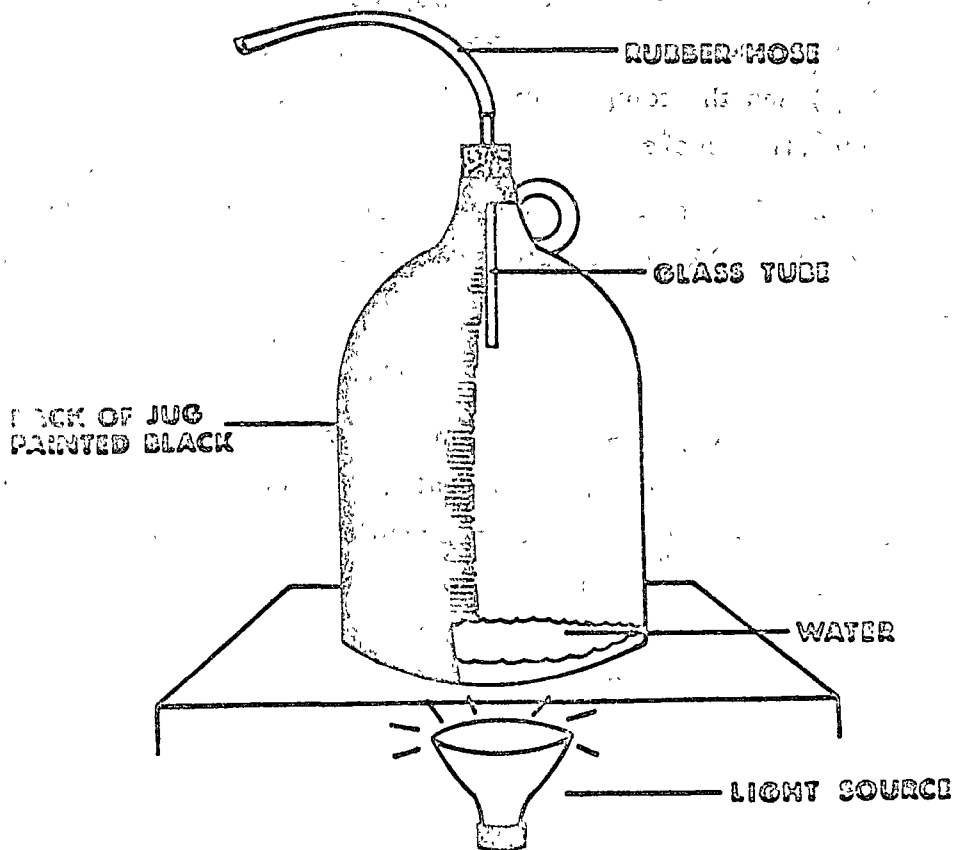


Figure 1.8 The fog bottle

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contracts in response to atmospheric pressure changes. The principle involved here is the same as that discussed in the cardboard box example earlier. Atmospheric pressures greater than those inside the container cause the can to "collapse" slightly. A lever and pen-arm attached to the can record the "breathing" of the can in response to the changing weight of the atmosphere. The aneroid barometer can be converted into an altimeter by substituting a dial with values of altitude in place of pressure. The altimeter indicates the altitude of an aircraft by actually measuring the barometric pressure at that altitude. Because the atmospheric pressure changes over time and space, the pilot must always set his altimeter-barometer to the pressure reading at the local airport.

The Gas Law

Late in the 18th century, chemists in both England and France discovered simple relationships between the volume of a gas and the pressure it exerted (Boyle's Law) and between the volume of a gas and its temperature (Charles' Law). (If you wish to review these laws, consult a high school chemistry text.) Later these two concepts were combined. Thus, in still air, only two factors--the density* (ρ)² and the temperature* (T) of dry air--determine the pressure exerted by the atmosphere.

The density is a measure of the weight and number of molecules present in a given volume. Mathematically, density is equal to the mass (M) per unit of volume (V):

$$\rho = M/V.$$

Units of density are expressed as grams per cubic centimeter or pounds per cubic foot. The temperature is, in reality, a measure of the speed of the molecules. The pressure (P) is then proportional to the mathematical product of the density and the temperature, or how heavy the molecules are, how many there are, and how fast they are moving. This relationship is referred to as the Gas Law. The Gas Law can be expressed in symbolic form as

$$P = \rho R_d T$$

(Pressure = density \times gas constant \times temperature),

² ρ , the Greek letter rho, is commonly used as a symbol for density.

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where R_d is the proportionality constant, commonly called the gas constant, for dry air. The gas constant also accommodates differences in the units of pressure, density, and temperature.

From the Gas Law we see that the pressure will increase if the density increases at constant temperature. An increase in density can be accomplished by increasing either the number or mass of the individual molecules in a given volume, or by decreasing the volume through compression while maintaining the same mass. Likewise, a net increase in molecular speed (which is indicated by a temperature increase) will increase the pressure at constant density. This relationship is complicated, however, by the fact that temperature changes affect the density if the volume is allowed to vary. Normally, if we heat air, that is, increase its temperature, we decrease its density at the same time. Heating causes a given parcel of air to expand, and thus the molecules move farther apart, thereby reducing the density through an increase in the volume. A partially inflated balloon serves as an example of the temperature-volume relationship under constant atmospheric pressure. Allowing the air in the balloon to warm causes the balloon to expand in volume. Conversely, the balloon will contract if it is placed in a refrigerator. So warming the air does not necessarily increase the pressure. In fact, under normal circumstances, the density decrease resulting from heating will dominate, and the pressure of the heated air will actually be lower than the pressure of the air before it was heated. Similarly, cooling the air usually increases the density to such an extent that there is an increase in the air pressure.

Consider a parcel of air of constant mass. If this parcel is carried upward from the surface of the ground, it will experience lower atmospheric pressures for the reasons explained earlier. From the Gas Law and other physical considerations involving heat, we see that the temperature of the parcel will be cooled, provided no other heat is either supplied or removed. (External heating or cooling can be accomplished by heating by the sun, radiative cooling from the earth's surface, or evaporation-condensation of water. All these processes will be described later.) As we will see later in this chapter, significant meteorological events occur when a rising parcel of air cools or a sinking parcel warms.

Generally speaking, warm air is less dense than cold air and exerts less pressure. Cold air is so dense that the pressure usually increases as the air is cooled. Thus, one of the first difficulties in finding a direct relation between pressure and temperature becomes apparent. Even more serious complications arise when air in motion is considered. The effect of wind on the piling up and thinning out of the air is very significant. These effects also produce pressure increases and decreases and are of such importance that an entire section will be devoted to the problem in a later lesson.

C. WATER VAPOR IN THE ATMOSPHERE

Understanding the presence of water molecules in the air is basic to understanding the physical processes involved in the formation of clouds. Water is unique; it is the only substance that occurs naturally in our atmosphere in all three phases: solid, liquid, and vapor. Water in solid form appears as ice or snow, hail, or sleet. The liquid form appears as rain or cloud droplets*; the vapor, or gaseous, phase is invisible. (One should not confuse vapor with steam, which is visible due to the large numbers of water droplets it contains.) Condensation* is the term used for the phase change from gas (vapor) to liquid that occurs as a result of a large number of water molecules being brought close enough together to form droplets.

<p>Cloud droplet: A small spherical particle of liquid water with a diameter ranging from 0.0003 to 0.0024 in.</p>
--

When water molecules change from the vapor to the liquid phase, that is, when condensation occurs, a certain amount of heat energy is released as a result of the slowing down and aggregation of the individual molecules. Because in the liquid phase water molecules are more tightly packed or bound together, the liquid phase is said to be a lower energy state of the substance than the vapor phase. This is more easily understood when it is recalled that heat must be added to a liquid substance in order to release the molecules from their close proximity to one another. The addition of heat separates the molecules and results in the vapor phase. Generally, the evaporation* process, where a liquid changes to a vapor, is just the reverse of the condensation process. In the case of liquid water, 540 cal (calories) of heat are required to vaporize a gram of water. Conversely, when water vapor condenses, 540 cal per gram of heat are released to the air.

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Schematically,

Condensation: Vapor Phase \rightarrow Liquid Phase + Released Energy of Condensation
(high energy state) (i. e., latent heat release)

Evaporation: Liquid Phase + Added Energy of Evaporation \rightarrow Vapor Phase
(low energy state) (high energy state)

From this brief description of the condensation-evaporation processes, it becomes readily apparent that we must have some measure of the gaseous water in the atmosphere. Water vapor is not one of the atmosphere's most abundant substances. Indeed, there may be places and occasions when there is virtually no water vapor in the air at all. This requires the defining of a special terminology, which describes the quantity of atmospheric moisture. In general, the term humidity* represents some measure of the water-vapor content of air. In everyday experiences, we normally think of "humid" conditions as those in which the moisture content of the air is quite high. However, these are only qualitative evaluations and are unsuitable for scientific investigations. We will now introduce several quantitative terms used in meteorology to describe the amount of water vapor in the atmosphere. This can be approached either from direct measurements of the amount of observed vapor or by determining the point at which condensation is able to take place.

Vapor Pressure*

Recall that in a gas mixture, each constituent acts independently of the other. One way of measuring humidity in the atmosphere is to obtain a measure of the pressure exerted by the water vapor present in the air parcel. We will define vapor pressure (e) as the pressure exerted by the actual number of water molecules in the air. The vapor pressure has a range of values from 0 to 50 mb under normal conditions. Since, as we have seen, the average atmospheric pressure is in the neighborhood of 1000 mb, the contribution from water molecules is only about 5% at most.

Saturation Vapor Pressure*

There is a limit to the number of water vapor molecules that can exist in the air in the gaseous phase. When this limit is reached, the air is said to be

saturated; the addition of any more molecules would result in condensation. This limit, referred to as the saturation vapor pressure (e_s), is a measure of the pressure exerted by the maximum number of water molecules the air can hold before condensation takes place.

The saturation vapor pressure depends primarily on the temperature of the air. Cold air cannot hold as many water molecules in the vapor phase as can warm air. In warm air, the molecular motion is so great that it is very difficult for sufficient numbers of molecules to come together at a single point to produce a droplet. Table 1.3 gives the saturation vapor pressure for different air temperatures. Note that at 35°F the air can accommodate only 7 mb of water molecules before condensation occurs. At temperatures of 85°F, the upper limit is 40 mb. The difference in the holding capacity of the air shows why great quantities of moisture can be transported only by warm masses of air.

Table 1.3

SATURATION VAPOR PRESSURES AT VARIOUS TEMPERATURES

<u>Temperature (°F)</u>	<u>e_s (in millibars)</u>
50	12
55	15
60	18
65	20
70	25
75	30
80	35
85	40
90	48

Relative Humidity*

Relative humidity, a measure of how close the air is to saturation, is simply the ratio of the vapor pressure to the saturation vapor pressure. Relative humidity is not a measure of the actual amount of moisture in the air. Rather, to determine the relative humidity, the actual amount of moisture is

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divided by the maximum amount possible. Expressed symbolically, the relative humidity (RH) is defined as

$$RH = \frac{e}{e_s} \times 100\%$$

$$\text{(Relative humidity} = \frac{\text{vapor pressure}}{\text{saturation vapor pressure}} \times 100\%).$$

If the room temperature is 75°F, we find from Table 1.3 that the saturation vapor pressure (the maximum possible) is 30 mb. Suppose it is found that the pressure exerted by the actual number of water molecules (vapor pressure) in the room is only 15 mb. Obviously, the air in the room is not saturated and condensation will not occur. In this case, the pressure exerted by the maximum possible amount of water molecules--30 mb--is twice as large as the number of water molecules actually present--15 mb. Using the equation given above,

$$RH = \frac{15}{30} \times 100\% = 0.5 \times 100\% = 50\%$$

we find that the relative humidity is 50%. (See Weather, page 12.)

Dewpoint*

Note from Table 1.3 that if the temperature of the room in our example were lowered to 55°F, the air, at that temperature, would become saturated and the relative humidity would be 100%. In this instance, the temperature of 55°F would be called the dewpoint for that parcel of air because it is the temperature to which the air must be cooled in order for it to become just saturated (RH = 100%). Meteorologists use the dewpoint to determine the actual amount of water in the air. The relative humidity is used to determine how close air is to saturation. When saturation occurs, conditions are ripe for condensation and the formation of clouds or fog.

Certain conditions can alter the relative humidity of an air parcel. Increasing the relative humidity toward 100%, or saturation, can be achieved in only two ways: (1) by cooling the air (reducing the saturation vapor pressure) or (2) by adding water vapor molecules to the air (increasing the vapor pressure). Conversely, the relative humidity can be decreased only by taking water molecules out of the air or by warming the air. The latter fact explains why the air

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in our homes becomes so dry in winter. As the cold exterior air is warmed by the heating plant, the saturation vapor pressure is increased but the vapor pressure remains the same, since water molecules are neither added to nor subtracted from the air. This increase of saturation vapor pressure decreases the relative humidity in proportion to the amount the air is heated.

The value of the relative humidity also tends to undergo a diurnal* change. Normally, outside air temperatures rise during the day until a maximum temperature is reached in midafternoon. But since this warming may occur without the addition of water vapor to the air, the relative humidity tends to decrease up to the time the maximum is reached. On the other hand, as the temperature falls to a minimum during the evening and nighttime hours, the relative humidity tends to rise. Thus the relative humidity changes throughout the day, even though water vapor is neither added to nor extracted from the air.

Diurnal: Used to describe a periodic phenomenon that occurs daily, or over a 24-hour time period.

To clarify the use of the term relative humidity in meteorology, an experiment utilizing a fog bottle will be described. The fog bottle is a simple device which demonstrates how air can be cooled and the moisture in the atmosphere condensed to produce droplets that form clouds and perhaps ultimately other forms of precipitation.

D. THE CONDENSATION PROCESS

Cloud droplets are produced by condensation of water molecules after saturation of the air occurs. Saturation occurs either (1) when air is cooled to its dewpoint or (2) when enough water vapor molecules are added so that the saturation vapor pressure is reached. The first of these processes, cooling to dewpoint, can be illustrated by the formation of drops on the outside of a glass of ice water. Air near the cold glass is cooled to its dewpoint, and the water vapor molecules on and near the glass condense. The second process, addition of water vapor to the air, occurs, for example, every time one takes a shower. The spray from the shower is a very effective source of water molecules, and the bathroom becomes so full of these molecules in the vapor phase that the

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relative humidity may be raised to 100%. Droplets then begin to form and a local fog is produced in the room. This process is actually one example of artificial cloud production.

In theory, condensation should take place when the relative humidity reaches 100%. This may occur over a large flat surface of liquid water, but in the free atmosphere, humidities well in excess of 100% are required for condensation to occur. Under such conditions, the air is said to be supersaturated.* Meteorologists have recently learned that it is extremely difficult for cloud droplets to form in air which is devoid of almost all dust particles or aerosols.* Only with relative humidities in the neighborhood of 150 to 200% will droplets actually form in this clean air, which is normally replicated only in the laboratory. Only when small particles of dirt and dust are present in the air will condensations occur at relative humidities close to 100%. Presumably the particles serve as surfaces on which the water molecules can conglomerate and thus form droplets more readily. These particles of dirt and dust are called condensation nuclei.* Good condensation nuclei are generally hygroscopic, that is, water seeking. Examples of such nuclei include salt particles or particles containing mixtures of soluble or slightly soluble compounds. Since relative humidities greater than 101% are rarely observed in the real atmosphere, it appears that there are always enough condensation nuclei present in the air. Particles found in the atmosphere include dust, aerosols, salt nuclei, and products of combustion from natural and man-made sources.

The Fog Bottle

The cloud formation process, including such necessary conditions as slight supersaturation and the presence of condensation nuclei, can be demonstrated using a fog bottle, illustrated in Figure 1.8. This device can be constructed easily and at minimum cost.

The articles needed to set up a fog bottle and to demonstrate the various aspects of cloud and fog formation are these:

- a bottle, for example a gallon jug, which has been painted flat black over one half of its surface to give a better view of drops formed within the bottle (see Figure 1.8).

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- a light bulb or other source for illuminating the bottle from underneath, to facilitate inspection of the fog. The tiny drops formed in suspension in air within the bottle will scatter the light and thus become more visible.
- a rubber stopper, with a small hole for a glass tube, to be inserted in the neck of the bottle.
- a small glass tube with a short length of rubber hose attached. The tube is to be inserted into the stopper.
- a small amount of water.
- matches.

To prepare the fog bottle for use, add about 1 in. of water to the bottle, insert the stopper with glass tube and rubber hose attached, and position the bottle over the light source. If you are unable to carry out the demonstration, fix the description of the apparatus firmly in mind so that you can picture the processes described below.

(1) Cooling to Saturation. In order for drops to be formed in the air over the water in the fog bottle--that is, for fog to form--slight supersaturation of the air is necessary. As you recall, supersaturation can be achieved only by bringing the relative humidity to just over 100%. This can be achieved by (1) cooling air to its dewpoint or (2) adding more water vapor molecules to the air. In the first process we will describe, the air in the fog bottle becomes saturated by being cooled to dewpoint.

Initially, as the air and water in the fog bottle are slightly heated by the bulb used to underlight, molecules continually escape from the water surface through the process of evaporation. Thus, the air above the water surface is acquiring a larger vapor pressure. Normally, this increase of relative humidity from the addition of more water molecules is not sufficient in itself to produce saturation of the air, and thus no fog forms in the jar if nothing more is done.

In order to cool the air in the fog bottle to induce condensation, air should be drawn out of the bottle through the rubber hose, which should then be clamped shut. Removing some air permits the remaining air to expand, thus reducing its

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temperature. This procedure simulates the way in which air in nature is cooled by lifting to higher levels of the atmosphere where the reduced pressure permits expansion. The cooling effect of expansion can be observed whenever air is let out of a tire. Air inside of an inflated tire has been compressed. When the air is released, that is, when expansion occurs, the molecules of air must work against neighboring molecules in order to expand and enlarge the volume. This work is done at the expense of the molecules' energy of motion, and as a result they slow down. As we have seen, this slowing of the air molecules corresponds to a decrease of the air temperature.

By simply drawing on the rubber hose, most people can reduce the pressure in a fog bottle by about 100 mb. When the air is expanded by drawing on the tube, lifting of the air to an elevation of 2500 to 3000 ft is simulated. This is usually sufficient to cool the air in the jar to its dewpoint, and saturation results. Each time the expansion is repeated, that is, each time air is drawn from the bottle, the fog will appear slightly thicker because residual drops remain suspended in the air from the previous expansions.

(2) Cloud Evaporation. To simulate cloud evaporation, it is necessary merely to compress the air in the bottle by releasing the rubber hose and allowing air to rush back into the bottle. This compression warms the air enough to reduce the relative humidity to such a degree that the drops evaporate as a result of the heat addition. The compression heats the air, and the heat energy thus supplied separates the molecules so that the water returns to the vapor phase and droplets can no longer be seen.

(3) Condensation Nuclei. To demonstrate the effect of adding condensation nuclei, you can add the combustion products from a burning match to the air in the bottle. Simply draw some air out of the bottle and pinch off the rubber hose. Then hold a lighted match near the hose so that the flame is drawn into the end of the hose when you release it. This will permit carbon particles and other foul substances from the combustion process to enter the bottle. Be sure to let the smoke from the match dissipate before the flame is drawn into the hose. Expansion of the air in the bottle (by drawing some air out through the hose) under these circumstances will invariably produce a very thick fog indeed. The

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dramatic effect is achieved because drops form more readily on the additional condensation sites provided by the various nuclei:

As we have seen, the fog bottle demonstrates the principal factors involved in the formation of clouds and fog: cooling of the air in the bottle to saturation by expansion, and the effect of condensation nuclei. The reverse process of evaporation can be also simulated by compressing the air in the bottle.

E. COOLING AIR BY LIFTING

An essential process in the natural formation of clouds is the lifting of air which causes cooling and, subsequently, condensation of any moisture. A reduction of pressure occurs when the parcel of air is lifted upward to higher levels of the atmosphere. As a consequence, expansion of the volume takes place, accompanied by cooling of the air parcel. (This process was simulated in the fog bottle experiment.) In the next section we will consider the rate of cooling which accompanies the lifting of the air parcel.

Natural cloud formation results from one of the following lifting mechanisms:

1. differential heating of the earth's surface;
2. orographic lifting; or
3. vertical air motion produced by wind circulation in low-pressure weather systems.

Differential Heating of the Surface

Differential heating of the earth's surface occurs as a result of the differing heat capacities of various substances. During the day, land warms up more rapidly than water, for example. Because water has a very large specific heat*, more heat energy is required to raise its temperature one degree than it takes to heat the land the same amount. In addition, water evaporates from lake and ocean surfaces, tending to cool the air over the water. In the case of large bodies of water, the addition of large amounts of water vapor into the air, accompanied by cooler temperatures, has a significant influence upon cloud formation. Finally,

<p><u>Specific Heat:</u> The amount of heat energy needed to raise the temperature of a unit mass over one degree on a reference temperature scale.</p>

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because its surface is always in motion, water overturns and mixes, which means that for the temperature of water to increase, it must be heated to greater depths than land.

Plowed areas warm up more rapidly during the day than do neighboring forested regions. Dark or black surfaces absorb more solar radiation, and thus are heated more, than do more reflective light-colored surfaces. Black asphalt parking lots, and cities in general, are much warmer at midday than the surrounding countryside. As a result of these differences in the rate of heating, the air over various types of surfaces has different temperatures. When warm air lies next to cooler air, buoyant forces are set up that cause the warm air to rise. These rising air parcels of warm air are called thermals*. Glider pilots look for "hot spots" on the surface, which produce thermals and allow their gliders to gain altitude and sustain flight. Air contained in these thermals can be lifted to the condensation level and produce the characteristic fair-weather cumulus clouds we see on sunny afternoons.

Orographic Lifting*

The term orographic lifting refers to the forced ascent of air when air moving horizontally comes against the side of a mountain or similar obstacle. When this occurs, some air is forced upward along the side of the mountain, and as a result clouds may form on the windward side. The heavy rains and fog on the windward slopes of the Pacific Northwest and the Hawaiian Islands are notable examples of the orographic lifting of moist oceanic air.

Vertical Air Motion in Low-Pressure Systems

In the next chapter, we will discuss in detail the circulations associated with atmospheric pressure systems. The wind circulation into a low-pressure system causes an ascent of the air. Thus, the uplift of air in a low-pressure system produces expansion and condensation. As a result, we can explain the often-observed fact that low-pressure systems are associated with cloudiness and rain.

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On the other hand, high-pressure systems are characterized by sinking air, which results in compressional warming of the air with subsequent evaporation of the cloud droplets, resulting in clear skies. (See Weather, pages 13-15.)

F. RATES OF COOLING BY LIFTING

In order to understand the process of cloud formation, we need to know how the temperature of an air parcel changes as a result of lifting of the parcel. We will begin with a discussion of rising parcels of dry air and will then describe the effect of saturation and condensation on a rising moist air parcel.

Dry Adiabatic Lapse Rate*

The rate at which dry air cools as it is lifted is known as the dry adiabatic lapse rate. The word adiabatic refers to the fact that the temperature change of the rising air parcel is produced only as a result of expansion and is not affected by any external processes, such as condensation of moisture, radiation, or heat transfer by conduction or diffusion. We know that dry air cools at the rate of 5.5°F for every 1000 ft it is lifted. Conversely, as air parcels sink and are compressed, they also warm at the rate of 5.5°F per 1000 ft. (See Weather, page 39, for an illustration of adiabatic temperature changes.) Since by definition lapse refers to the rate at which temperature falls off, or decreases, with height, the dry adiabatic lapse rate is a positive number. That is, the 5.5°F per 1000 ft rate means the temperature of a parcel will cool on lifting or warm on sinking.

Note that the dry adiabatic lapse rate does not permit us to use the temperature at ground level to calculate the temperature at various levels in the atmosphere, even when the air is motionless. We cannot say, for example, that because the surface temperature is 71°F , the temperature at 2000 ft must be 60°F . The air at levels above the surface can be almost any temperature, depending on weather conditions. There is no static relationship between the surface temperature and the temperature at higher levels. The adiabatic lapse rate applies only to the change in the temperature of a given air parcel as it is lifted or sinks. Nothing can be said about the vertical temperature structure of the bulk of the atmosphere through which this parcel passes.

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Effect of Condensation

If at some level in the atmosphere a rising air parcel has cooled sufficiently to become saturated with water molecules, condensation takes place. At this point, the parcel will no longer cool at the dry adiabatic lapse rate. Rather, it will cool at some smaller rate, because of the warming of the air parcel that accompanies release of the latent heat of condensation. Recall that the energy released in condensation of 1 g of water vapor is 540 cal. This addition of heat reduces the rate at which a parcel of air cools as it is lifted. The amount of reduction in the rate of cooling depends, of course, on the amount of water vapor condensed. On the average, the reduction amounts to about 3°F per 1000 ft. Thus we say that the saturated rate of cooling is in the neighborhood of about 3°F per 1000 ft. (See Weather, page 41, for an example of how condensation complicates the adiabatic cooling process. We will return to the example of air flowing over a mountain range in a later lesson.)

G. RADIATIONAL COOLING AND CLOUDS

Most clouds result from some kind of forced lifting and subsequent cooling of air parcels. But certain types of cooling occur in perfectly still air to form ground fogs and dew or frost. The mechanism responsible for the cooling in these cases is the radiational cooling of the earth's surface that occurs to some extent every night, when the earth gives off, or radiates to space, the heat (energy) acquired during the day.

During the day the sun heats the earth's surface by radiation in the form of visible light. Visible light does not warm the air directly; rather, the air is warmed by its contact with the earth's surface. While most of the sun's energy, or radiation, that reaches the earth is in the form of visible light, other wavelengths of radiation from the sun are absorbed in the earth's atmosphere. (See Weather, page 6, and Figure 1.9.) The shorter wavelengths of radiation emanating from the surface of the sun, called ultraviolet rays, and shorter X rays are absorbed high in the earth's atmosphere and do not penetrate to the surface. Ultraviolet (UV) rays rarely penetrate below the first 50 mi of our atmosphere. Triatomic oxygen, or ozone (O_3), at these levels of the atmosphere is a strong absorber of ultraviolet energy and prevents the ultraviolet rays from

THE ELECTROMAGNETIC RADIATION SPECTRUM

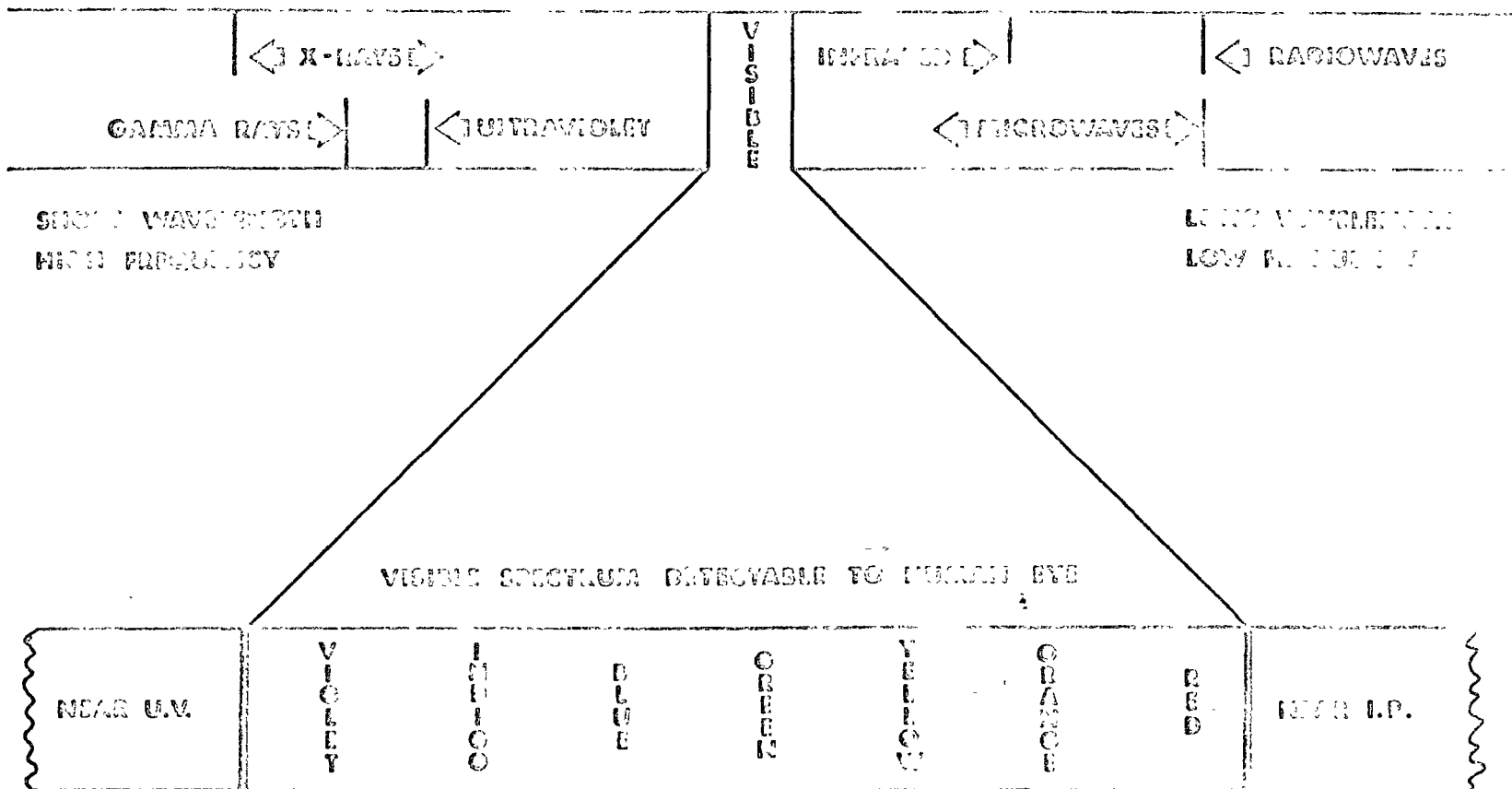


Figure 1.9 The electromagnetic radiation spectrum

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burning us to a crisp. This absorption is also responsible for the rather warm temperatures found at this level. Temperatures at 50 mi altitude are comparable to those found at the earth's surface. This level of warm air is referred to as the stratopause*.

Stratopause: The top of the stratosphere, at a level about 30 to 50 mi altitude, where temperatures reach a maximum of 32 to 35°F.

Longer wavelengths of solar radiation, known as infrared rays, are also absorbed by atmospheric constituents. Water vapor and carbon dioxide are good absorbers of infrared energy.

In summary, the sun emits all wavelengths of radiation, but only the visible light is responsible for heating the earth's surface, which in turn heats the lower layers of the atmosphere near the surface.

Since the earth cannot continually receive solar radiation without becoming increasingly hot, it must lose some of this acquired heat. The manner in which the earth loses heat, so as to maintain a relatively constant worldwide temperature, is by radiation of its own. The amount and type of such radiation emitted by any star or planet depends on the effective surface temperature of the celestial body. Hot objects like the sun radiate at short wavelengths, that is, at visible and ultraviolet wavelengths; cooler objects such as the earth radiate at longer, or infrared, wavelengths.

Note that the earth receives solar radiation only on the side facing the sun (in other words, during daylight hours). But the earth itself is radiating infrared rays at all times because of its surface temperature. During the day the incoming radiation exceeds the emitted radiation, but at night the only radiation is outward. Thus, the earth as a whole loses heat at night by what is called radiative cooling.

The Greenhouse Effect

As we saw earlier, infrared rays can be absorbed by water vapor in the air. On nights when there is little water vapor, or few water droplets, in the air, the infrared radiation to space from earth is very efficient, and air temperatures near the earth's surface are, as a result, dramatically reduced. On the other hand, on cloudy nights when a good deal of water in the form of vapor or droplets covers the earth's surface, relatively little infrared energy can escape.

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The molecules of water absorb the infrared energy from the surface and reradiate it back to earth, thereby reducing the rate of cooling of the earth. Reradiation by the water molecules of the absorbed infrared energy occurs in all directions, up, down, and sideways. The net effect is to return some of the infrared to the earth's surface. This returning infrared energy rewarms the earth and results in a cooling rate lower than would be observed on a perfectly clear night.

This process whereby clouds and water vapor absorb and reradiate infrared radiation to the earth is called the greenhouse effect, because a greenhouse operates on much the same principle. (See Weather, page 8.) During the day, visible light passes through the glass of the greenhouse because the glass does not absorb much of the visible light. The plants and earth inside the greenhouse are warmed and, like the earth itself, reradiate energy, or heat, in the form of infrared rays. Like clouds, the glass absorbs most of the infrared radiation emanating from inside the greenhouse so that only a fraction is radiated out to space. The net effect is to keep the greenhouse relatively warm during the night.

H. FOG TYPES

Fog is often considered to be simply a special form of cloudiness. But fog droplets are usually smaller than cloud droplets and are often formed by processes other than lifting of air. A variety of saturation and condensation processes are involved in the formation of different types of fogs. The five main fog types are (1) radiation fog, (2) upslope fog, (3) steam fog, (4) advection fog, and (5) rain fog.

(1) Radiation Fog

As we have seen, the infrared radiation from the earth is free to escape to space on dry, cloudless nights. Under these clear sky conditions, air near the ground undergoes a great deal of cooling during the night. The maximum cooling is restricted to the first several hundred feet of the atmosphere but can produce extremes of overnight low temperatures. The cooling may be so great that patches of air are cooled to saturation. When the dewpoint temperature in these patches is reached, patchy ground fog results. This condition is enhanced when calm conditions are present. The effect of the winds is to stir the air so

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that warmer air lying above the first few hundred feet is mixed with lower, cooler air down to the surface, with the result that slightly higher minimum temperatures occur at ground level than would be expected if the air were perfectly still.

The presence of a snow cover on the ground also enhances the effect of radiational cooling at night. Because snow is an excellent absorber and radiator of infrared energy, more infrared radiation occurs during the night over snow-covered ground than would occur over bare ground. Optimum conditions for record overnight low temperatures and morning ground fog are clear, calm nights when a snow cover is present.

(2) Upslope Fog

In mountainous regions, slight air movements up the mountain slopes may cool the air to dewpoint and produce a good deal of local fogginess. Because of the frequency of upslope fog in its mountains, West Virginia has a fog frequency comparable to that of the coastal cities where the proximity to moisture sources produces the highest incidence of fog.

(3) Steam Fog

Whenever cold, dry air passes over a warmer water surface, moisture may be added to the air by evaporation. The addition of water vapor in this way increases the relative humidity of the otherwise dry air to the point where saturation and subsequent condensation may occur. Cold-air outbreaks over the Great Lakes in the fall can significantly alter the cloudiness of cities on the lee (or downwind) side of lakes. Of course, this same effect can be observed over smaller bodies of water as well.

(4) Advection Fog

The term advection* refers to the horizontal transport (or conveyance) of some property of air (warmth or moisture, for example) solely by means of motion of the air. For example, cold advection refers to the horizontal transport of cold air over relatively warmer ground. Moist advection describes the horizontal transport by the wind of moist air over relatively drier air.

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Under conditions of both warm and moist advection, the surfaces over which the air moves are relatively cold as compared to the air. When this air is cooled by the ground over which it is moving, advection fog results. Warm, moist air often lying over the warm Gulf Stream in the western Atlantic Ocean for a period of time frequently comes into contact with the cooler air over cold currents of water in the vicinity of Greenland and Newfoundland. The result is the famous fog banks of these areas. Advection fogs, unlike radiation fogs, can persist to great heights in strong winds.

(5) Rain Fog

When rain begins to fall from a cloud whose base is below 6500 ft above the ground, water vapor is added to the air under the base of the cloud by evaporation of the raindrops. The vapor pressure of the air may thereby be increased to the point where saturation and condensation occur beneath the precipitating cloud. The result is that clouds form under the original cloud in a ragged fibrous form. These clouds are often referred to as scud.

Fog can also form during the early morning hours as a result of prior rainfall. Because the ground is extremely wet, it serves as a source of water vapor to the air above it, which is cooling during the early morning. These conditions are favorable for early fogs that may persist late into the morning.

Dew Formation

Dew and frost (frozen dew) commonly form under conditions favorable for fogs. The tendency for dew and frost to form on surfaces of plants and grass and on other surfaces simply reflects the fact that the maximum radiative cooling is occurring from these surfaces (that is, they are giving off, or losing, large amounts of energy, or heat). The air nearest the surfaces is cooled the most, and drops form most readily on the surfaces themselves.

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I. CLOUD CLASSIFICATION³

Clouds are classified in two ways: (1) by their characteristic appearance and (2) according to the height of their bases. Let us first consider the cloud appearances. Widely separated, puffy clouds are called cumulus clouds. Cumulus clouds generally form as a result of differential surface heating. As we have seen, local hot spots on the earth's surface generate thermals, or rising plumes of warm air, which eventually cool and condense, usually before they reach 6500 ft. Cumulus clouds have flat bases appearing at uniform heights. As these clouds rise to heights where the wind speed is greater than that at the surface, they tend to be blown over on their sides. The portion of the cloud which is sinking dissipates by evaporation. Seen in time-lapse cloud photography, cumulus clouds exhibit a rolling motion as a result of being knocked over by the higher winds aloft (see Figure 1.10). The lifetime of a cumulus cloud is often less than 15 min. The rising, thermal portion of the cloud is being formed while the sinking, blown-over portion is being dissipated. The maximum height to which a cumulus cloud can build is frequently limited by the presence of a warm layer of air above the earth's surface. The rising plume loses its buoyancy when it encounters a warm layer, and continued growth is inhibited. Often warm layers are produced by sinking air, which is quite dry due to evaporation. The dryness of the warm layers is another factor limiting cloud growth. This occurs over the central Pacific Ocean, where cumulus clouds can develop to only 7000 or 8000 ft.

Stratus clouds are stratified, or layered, clouds. They are usually produced by gentle lifting of air that occurs over relatively large areas. The widespread stratus layers often occur in the vicinity of large low-pressure areas where wind circulations force air upward. Whereas the drops in fair-weather cumulus clouds are seldom sufficiently large to fall out as precipitation, stratus clouds are capable of producing drizzle, light rain, or snow, and on occasion heavy, continuous precipitation. Stratus clouds from which rain is falling are sometimes classified as nimbostratus. The prefix nimbo- refers to the fact that they produce precipitation.

³To enhance your understanding of clouds, refer to Weather, pages 16-20, and the pamphlet entitled Clouds (Washington, D. C.: U. S. Government Printing Office, 1969) as you work through this section.

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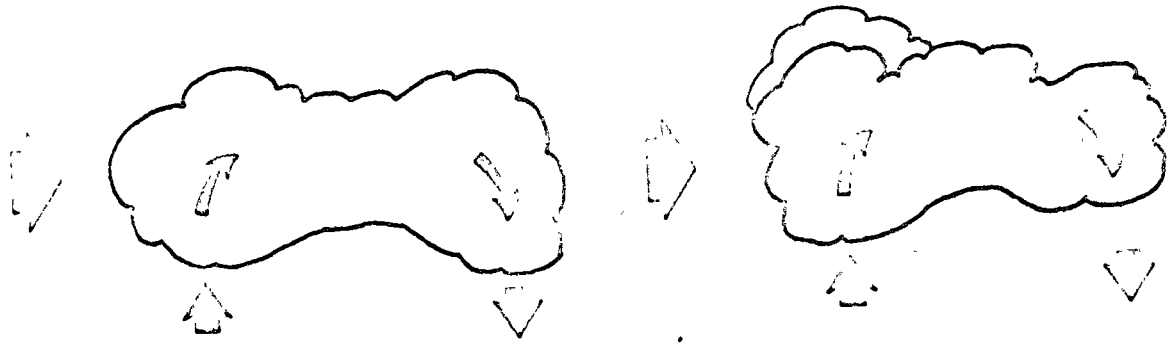


Figure 1.10 Rolling motion of cumulus clouds

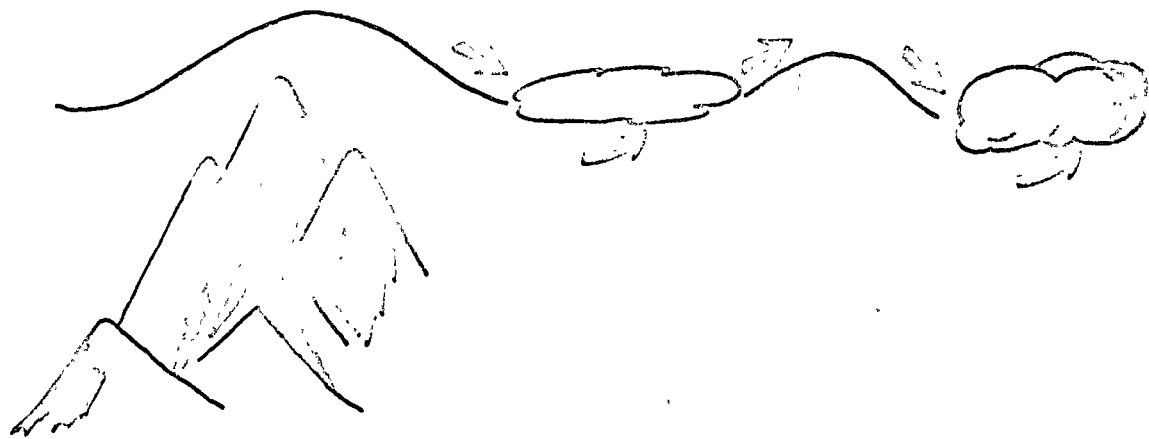


Figure 1.11 Altocumulus lenticularis

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Clouds are further classified, as we have stated, according to the height of their bases above the earth's surface. Observations to differentiate between cloud types are generally made by trained observers who use either experience or the instruments described on page 126 of Weather. The beginner can practice by comparing the cloud he observes with pictures in a cloud atlas. Judging the height of a cloud can be difficult; however, there are certain aids, such as landmarks (TV towers, mountains, or skyscrapers), the general altitudes of aircraft, and the clues given by the clouds themselves. Low clouds--those with bases below 6500 ft from the surface--are simply either cumulus or stratus. If a layer of puffy clouds occurs, they are called stratocumulus. Middle clouds, whose bases are observed to be between 6500 and 20,000 ft, are prefixed with the term alto-, meaning middle. Thus we find both altocumulus and altostratus clouds. Traditionally, meteorologists further classify clouds according to some distinguishing characteristic of the specific cloud type. For example, altostratus clouds through which the sun can be observed are called altostratus translucidus. If the sun is not visible through the cloud deck, the term altostratus opacus is used.

An especially distinctive form of middle cloud is the altocumulus lenticularis (lens-shaped), which is frequently observed in the lee, or sheltered, side of mountain ranges (see Figure 1.11). Air flowing over the mountain develops wavelike sinking and rising motions downstream from the ridgeline. This stationary wave motion produces stationary clouds in the ascending portion of the wave pattern and clear areas in the descending portion. The lens shape of the lenticularis cloud results from the constant reforming of the cloud in the ascending flow and dissipation in the descending branch, the process described above in the discussion of cumulus clouds. Winds in excess of 100 knots (kn) can blow through these clouds, but the stationary wave pattern established on the lee of the ridge insures that the clouds remain in the same relative position despite the strong winds blowing through them.

High clouds are prefixed with the term cirro-. Cirrocumulus and cirrostratus clouds have bases above 20,000 ft from the surface and consist of ice crystals that give them their fibrous, wispy appearance. As the ice crystals fall out of the cloud, they produce trails and streaks, a phenomenon which has given rise to the popular name "mares' tails." The presence of high cirrus clouds, as we will see in Lesson

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3, often presages the approach of more general cloudiness and precipitation, especially if the clouds are observed to thicken and lower.

Under certain atmospheric conditions, cumulus clouds can grow to heights in excess of 50,000 ft. These clouds frequently produce lightning, thunder, and hail, and in some instances tornadoes. In the early stages of vertical development, the cloud is referred to as cumulus congestus, to signify the rapid building up of the cloud. When the cloud reaches the

tropopause*, where warm, dry layers of air exist, its vertical development ceases, and the top begins spreading out in the direction of the high-speed winds at these levels. The cloud thus takes on an anvil-like appearance and is

Tropopause: The top of the troposphere, or the lowest layer of the atmosphere where most of the water vapor content and appreciable weather phenomena occur.

classified as cumulonimbus. The cumulonimbus cloud, or thundercloud, is capable of producing very large amounts of precipitation and very strong updrafts and downdrafts. At the surface, hail and winds in excess of 50 kn (about 58 mph) may occur, resulting in serious damage to property and crops. The mechanisms involved in the generation of thunderstorms will be discussed in a later chapter.

SUMMARY

In this chapter we have considered these major concepts:

- Air is a mixture of gases.
- Atmospheric pressure, defined as the force per unit area, represents the weight of the entire column of air above the earth's surface. A mercury barometer indicates the weight of the atmosphere which is balanced against the weight of a column of mercury.
- The Gas Law describes the relationship between the pressure, density, and temperature of a gas.
- Water exists naturally in the atmosphere as either solid, liquid, or vapor. Phase changes, especially the condensation-evaporation process are important in cloud development.

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- o Lifting of air parcels upward through the atmosphere reduces the pressure and cools the atmosphere. Cooling of moist air parcels can cause condensation and cloud formation.
- o Clouds, dew, and fog can also form by radiational cooling.
- o Clouds are classified by their base height and characteristic appearance.

SELF-EXAMINATION⁴

True-False

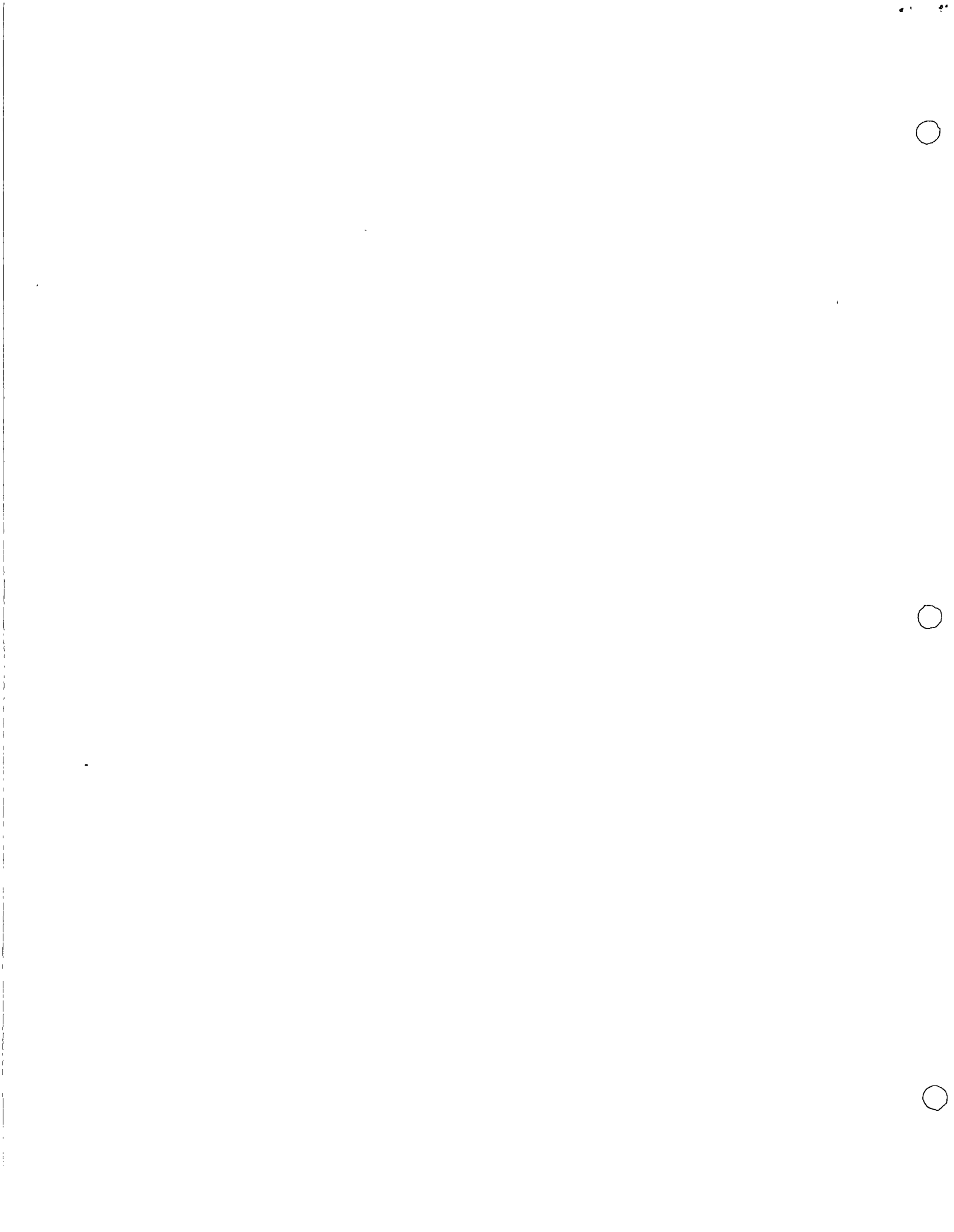
- _____ 1. The ratio of temperature to dewpoint gives the relative humidity.
- _____ 2. A parcel of air always expands and cools as it rises from near the ground to higher levels of the atmosphere.
- _____ 3. In order to saturate a parcel of air, it is necessary only to cool the parcel to its dewpoint.
- _____ 4. The dewpoint is an indication of the actual amount of liquid water in the air.
- _____ 5. Relative humidity is a measure of the actual amount of water vapor in the air.
- _____ 6. The millibar is a unit of pressure as measured in the English system of units.
- _____ 7. The Gas Law states that at constant density, cooling of the air will result in a pressure reduction.
- _____ 8. The relative humidity can be increased only by adding water vapor to the air.
- _____ 9. The relative humidity at ground level must be at least 100% before rain will fall.
- _____ 10. Stationary clouds formed on the lee side of mountains are known as stratocumulus lenticularis.

⁴ For answers to these questions, see the Key to Self-Examinations at the back of the book.



LECTURE 4 QUESTIONS

1. List 10 engineering related subject matter areas or subjects which you believe are the most critically needed in Mexico.
2. Establish a priority from 1 to 10 (with 1 having the highest priority) for the list asked for above.
3. Estimate the potential clientele for each subject.
4. Answer questions on
 - advertising?
 - others offering similar courses?
 - is there a better way?
 - suitable textbook?
 - suitable course writer?



about change. They also demonstrate, in a personalized way, sincere interest in what people in the organization think.

Exhibit 16 GENERAL METHODS OF NEED DETERMINATION

METHOD	ADVANTAGES	LIMITATIONS	DO'S AND DON'T'S
<i>Interview</i>	Reveals feelings, causes, and possible solutions of problems as well as facts Affords maximum opportunity for free expression of opinion, giving of suggestions	Is time-consuming, so can reach relatively few people Results may be difficult to quantify Can make subject feel he is "on the spot"	Pretest and revise interview questions as needed Be sure interviewer can and does listen, doesn't judge responses Do not use to interpret, sell, or educate
<i>Questionnaire</i>	Can reach many people in short time Is relatively inexpensive Gives opportunity of expression without fear or embarrassment Yields data easily summarized and reported	Little basis on for free expression of unanticipated responses May be difficult to construct Has limited effectiveness in getting at causes of problems and possible solutions	Pretest and revise questions and form as needed Offer and safeguard anonymity Use only if prepared to— • report findings, both favorable and unfavorable • do something about them.
<i>Tests</i>	Are useful as diagnostic tools to identify specific areas of deficiencies Helpful in selecting from among potential trainees those who can most profitably be trained Results are easy to compare and report	Tests validated for many specific situations often not available Tests validated elsewhere may prove invalid in new situations Results give clues, are not conclusive Tests are second-best evidence in relation to job performance	Know what test measures. Be sure it is worth measuring here. Apply results only to factors for which test is good Don't use tests to take blame for difficult or unpopular decisions which management should make.
<i>Group Problem Analysis</i>	Same as for interview plus Permits synthesis of different viewpoints Promotes general understanding and agreement Builds support for needed training Is in itself good training	Is time-consuming and initially expensive Supervisors and executives may feel too busy to participate, want work done for them Results may be difficult to quantify	Do not promise or expect quick results Start with problems known to be of concern to group Identify all problems of significant concern to group Let group make own analysis, set own priorities
<i>Job Analysis and Performance Review</i>	Produces specific and precise information about jobs, performance Is directly tied to actual jobs and to on-job performance Breaks job into segments manageable both for training and for appraisal purposes	Time-consuming Difficult for people not specifically trained in job analysis techniques Supervisors often dislike reviewing employees' inadequacies with them personally Reveals training needs of individuals but not those based on needs of organization	Brush up on job-analysis techniques, arrange special training for those who are to do it Be sure analysis is of current job, and current performance Review with employee both— • analysis of job, and • appraisal of performance.
<i>Records and Reports Study</i>	Provide excellent clues to trouble spots Provide best objective evidence of results of problems Are usually of concern to and easily understood by operating officials	Do not show causes of problems, or possible solutions May not provide enough cases (e.g., grievances) to be meaningful May not reflect current situation, recent changes	Use as checks and clues, in combination with other methods.

Open-ended, nondirective interviews are more valuable than other kinds for getting at feelings and attitudes and at the causes of problems. But they yield less uniform and less readily quantifiable data than do controlled interviews. Results of the latter are easier to process but may not be as valid, for their very structure tends to restrict and to influence the responses given.

Naturally, the more skilled the interviewer, both in asking and interpreting responses, the more valuable the data he will obtain. So try out your questions in advance and revise them if necessary to get them clearly understood; allow your subjects ample opportunity to talk unhurriedly; concentrate on listening to what they are really saying; do not make "value judgments" on their responses; and do not use the interview to interpret, sell, or educate. In case you feel

dubious about your interviewing skill: any information you get will be better than none, you will learn a lot in the process, and your interviewees will have an opportunity to contribute to solution of mutual problems.

You may get more accurate and more useful information if you ask your sub-

Exhibit 17
SOME NEED INDICATORS*

STUDY

Organization Plans

- projected changes in mission, structure, personnel, or procedures.

Employee Records

- high turnover.
- absenteeism.
- sick leave rates.
- accident severity and frequency ratios.
- tardiness.
- grievances.
- merit ratings.
- composition of supervisory force.

Official Inspections Reports

- by own organization.
- classification surveys.

Work and Work-flow

- production bottlenecks.
- fluctuations in production.
- reports on public or customer satisfaction with product or service.
- backlogs and where located.
- records of high cost, waste, excessive errors.

Supervisory Selection Policy

- qualification requirements
- experience and training background of present supervisors.

Management Audits

- by controlling department or bureau.
- special surveys.

OBSERVE

Morale Factors

- personal friction.
 - buckpassing.
 - complaints.
 - inattention to work.
 - leadership not held by appointed leader (the supervisor).
 - supervisory ineffectiveness in providing subordinates with sense of worth, belonging, and security.
 - lack of supervisory support of subordinates.
 - authoritarian leadership.
 - absence of sense of purpose and accomplishment.
 - etc.
- Job Knowledge*
- technical phases.
 - administrative phases.
 - supervisory phases.

Communication Failures

- written and oral instructions misunderstood.
- failure of information to flow up, down and across.
- inability to express, orally or in writing.
- semantic difficulties.

Poor Supervision

- assignment of work.
- planning and scheduling.
- instructing subordinates.
- handling grievances.
- lack job pride.
- lack job interest.
- poor coordination.
- inadequate recognition.
- failure to motivate.

Job Application

- putting knowledge and skill to work.
- will to improve, self-development.

The evening classes program presently serves approximately 1,000 students, generally in the metropolitan area of Milwaukee (population about 1,000,000). Institutes and short courses serve approximately 8,000 practicing engineers throughout the United States. The electronic media programs include an electrowriter network (SEEN), the Educational Telephone Network (ETN), video cassette courses (VCC), and broadcast television (etvn). With the exception of the electrowriter network, which has been in existence for about five years and is serving about 400 students per year, most of these systems, as employed for engineering programs, are new and have not had an opportunity to prove themselves. The correspondence study program serves approximately 3,000 students throughout the United States, and from foreign countries to a lesser degree (see Table 2.1).

Table 2.1

Extension Engineering Formats and Service

	Students served per year	Percentage of students from Wisconsin	Course content ¹
Evening classes	1,000	100	SA BE
Institutes and short courses	8,500	40	SA GE
Electronic media programming	450	98	SA BE GE
Correspondence study	1,100	40	BE

¹SA = state of the art.

BE = basic engineering.

GE = graduate engineering.



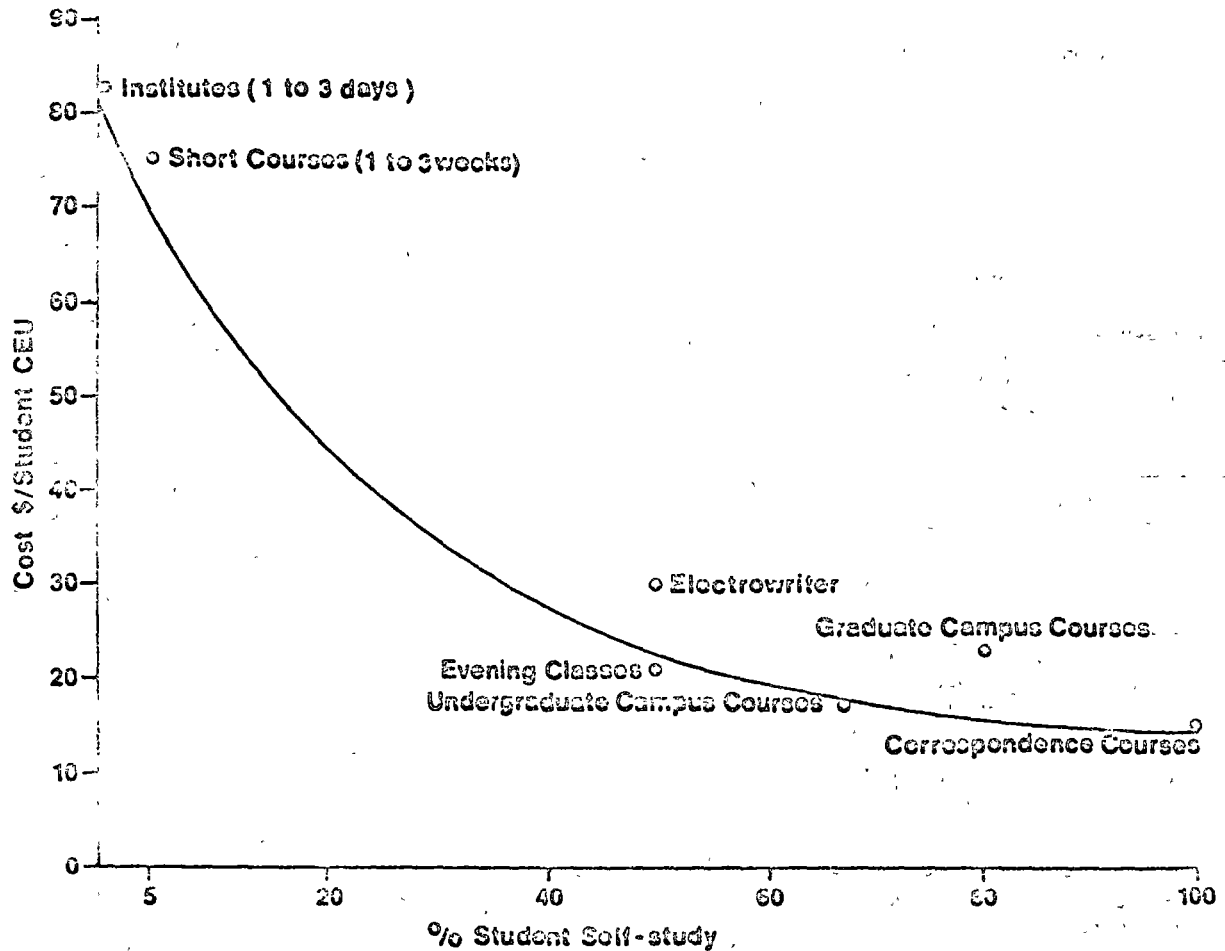


Figure 2.5 Comparison of unit costs

In the comparisons of unit costs given in Figure 2.5, the independent variable chosen as significant was the per cent of student self-study time. Thus, with 0 per cent as the case in the usual two-day institute with lecture format, the cost to the student is highest. Correspondence courses lie at the other end of the scale at nearly 100 per cent and a much lower unit cost.

In summary, Table 2.6 shows the comparison of the various media of continuing education from the standpoint of University cost, format, clientele served, level and scope of material presented, and methods used.

Table 2.6

Comparison of continuing Engineering education formats, 1973

<u>Format</u>	<u>Methods used</u>	<u>Clientele served</u>	<u>Average annual number of students</u>	<u>Level and scope</u>	<u>University cost: dollar/student CEU</u>
Correspondence study	Self-study with study guides and some audiovisual aids	Students remote from campus	1,100	Mostly undergraduate. Usually general interest topics. Seldom enough demand to justify advanced specialized topics	\$14.50
Institutes and short courses	Lectures and workshops	Practicing engineers and technical management	10,500	Very applied. Generally state-of-the-art	\$83.00 (institute) \$75.00 (short course)
Electronic media programming	Electrowriter network, educational TV, TV cassettes, etc.	Very broad range	450	Applicable to wide range from college courses to single-topic state-of-the-art	\$30.00
Evening classes	Lectures and labs	Working students, sometimes without company financial support	1,000	Often similar to college courses. Usually more applied. Some state-of-the-art programs	\$21.00
University campus courses	Lectures and labs	Resident students, part-time students employed locally	2,600 (engineering)	Generally aimed at resident campus students	\$17.00 (undergraduate) \$23.00 (graduate)

Format and Class Size. Since the efficient class size for each format is different, the number of students to be served may determine the most appropriate format. Correspondence courses have an ever-decreasing cost with increase in number of students. Radio and television, in some cases, are very similar.*

*New Educational Media in Action, Part I (Unesco: International Institute for Educational Planning, 1967), p. 202.

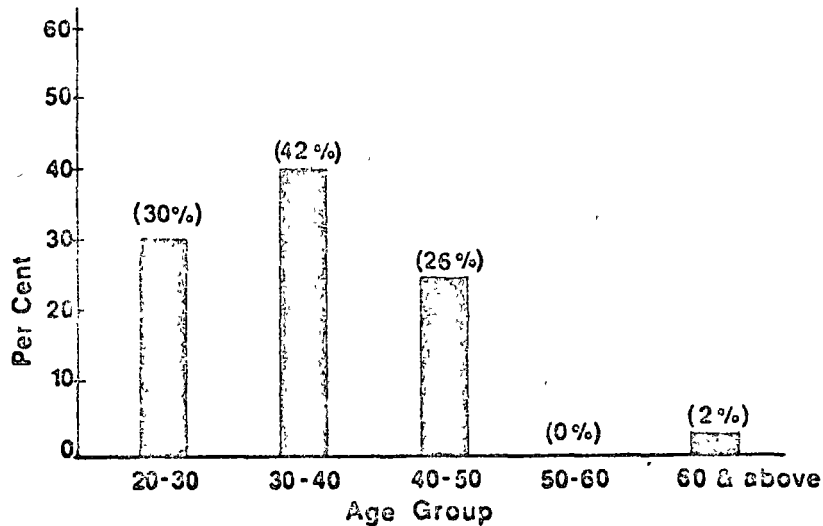


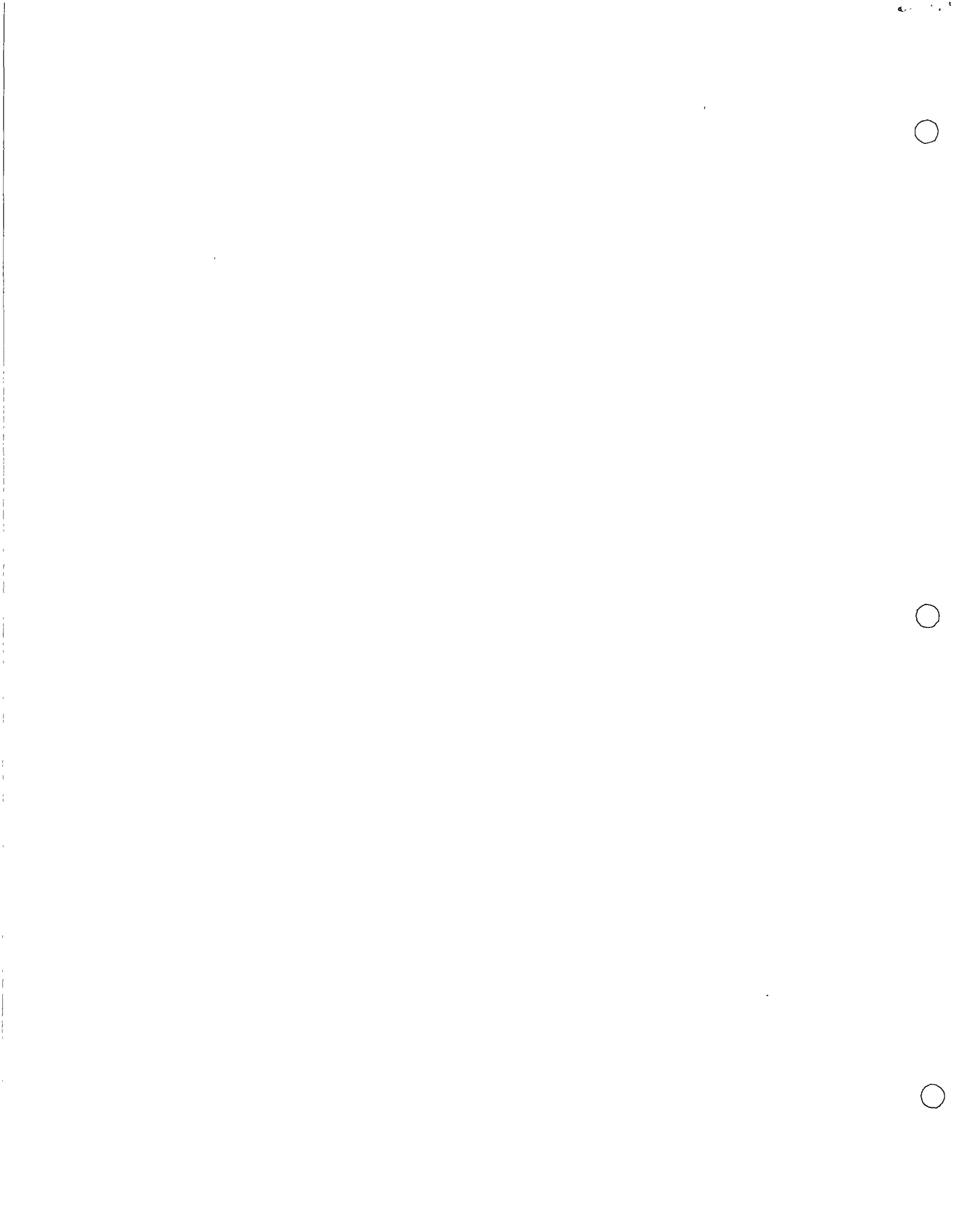
Figure 7.3 Age of accepted P.D.D. candidates

Several have more than the 1200 hours (120.0 CEUs), but have not completed the independent study project. Others have made little or no progress in several years, but are considered active candidates within the seven-year limitation of the program. The majority are progressing at varying rates. They are included as accepted candidates in Table 7.1.

Similarly, the dropout rate is indeterminate. Some candidates (6 of 143) have informed the University of their intention to drop from the program; others (about 25) are inactive but have not been officially dropped. It is the faculty advisor's responsibility to contact inactive candidates to determine whether they intend to continue in the program. The dropout rate is assumed to be higher than for traditional degree programs because of the responsibility it puts on candidates to progress without the motivating pressures of on-campus study.

Problem Areas

In addition to the administrative problem of dropping inactive candidates, the faculty advisors have also experienced a counseling problem. They have had little or no training in working with older professionals. With major workloads in other areas, they have experienced problems in communicating with and



INTRODUCTION

Meteorology 100, Weather and Climate, is an introductory course in meteorology. It is the equivalent of a one-semester classroom course. Satisfactory completion of the requirements of the course will enable you to earn two hours of credit.

The following pages will tell you how to proceed in this course. Read them before you actually start studying, and refer to them as necessary as you work through the course.

MATERIALS FOR THE COURSE

The following materials have been supplied to you:

Textbook: Meteorology: Weather and Climate, by Frank S. Sechrist and Edward J. Hopkins. Madison, Wisconsin: University of Wisconsin--Extension, 1974.

Study Guide Supplement: The booklet you are now reading, which contains written materials and information on doing the work of the course.

Pamphlet: Clouds, produced by the Environmental Sciences Services Administration. Washington, D.C.: U.S. Government Printing Office, 1969.

You will also need this book:

Weather: A Guide to Phenomena and Forecasts, a Golden Science Guide. New York: Western Publishing Company, Inc., Golden Press, 1965.

You may purchase this book from University of Wisconsin--Extension Bookstore. When ordering, please send a check or money order payable to University of Wisconsin--Extension.

The Textbook. Meteorology: Weather and Climate has been designed for self-study. It is divided into ten convenient units, or lessons, each of which includes a set of learning objectives, a summary, and other features found in

Introduction

materials designed for individual, independent learning. Early units also contain self-examinations, for which an answer key is provided.

The Study Guide Supplement. The booklet you are now reading, the Study Guide Supplement, adds assigned written work to your self-study and puts you in contact with an instructor by mail. It contains written assignments corresponding to the ten lessons in the textbook; answer sheets for these written assignments are to be sent in to University of Wisconsin--Extension for grading. The Supplement also contains a Midcourse Exercise, to be completed and sent in for grading when you have completed Lesson 5, and forms for requesting the final examination and a transcript of credits earned in the course.

HOW TO DO THE WORK OF THE COURSE

Written Assignments. Work through the course material lesson by lesson, beginning with Lesson 1. Your learning may be enhanced if you proceed as follows:

1. Study the material in the textbook for each lesson, referring to the Clouds pamphlet and the Golden Science Guide, Weather, where indicated. If possible, utilize additional related materials in areas of interest to you. The Bibliography at the back of the textbook contains many references that may be available at your local library.
2. In early lessons, after careful study of the lesson material and when you feel that you understand it, take the self-examination. Then check your answers in the Key to Self-Examination and restudy the lesson material as needed before proceeding to the written assignment. In later lessons, proceed directly to the written assignment when you have thoroughly studied the material of the lesson.
3. Work through the written assignment, jotting your answers on scratch paper or beside the questions. Check your answers to be certain you are satisfied.
4. Transfer your answers to the special answer sheets in the back of this Supplement. Take care to use the correct sheet or sheets for each assignment. Complete the answer sheet by filling in your name, your mailing

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address, and other information requested. Put your name and the lesson number on any additional sheets of paper you use. Assemble the sheets in the correct order and fold in half as directed.

5. Insert your work in one of the special envelopes provided and seal it. Fill in the information requested. Mail the envelope.
6. Proceed to the next lesson in your next study period. Do not wait for the lesson you have mailed to be returned to you.
7. Transmit any questions you have about course subject matter to your instructor. Just include them with the work you mail in. He will be happy to answer them or lead you to an answer. You should proceed with the work of the course while you await his reply.

If you prefer to talk with your instructor, feel free to request his phone number and ask him to suggest times when he can be reached by phone. If your instructor lives nearby, you may even wish to arrange a face-to-face meeting with him.

Note: A teacher is always interested in individual students and their progress. Your instructor would welcome a letter or note, included with a written assignment, telling about yourself, your particular situation, your reasons for enrolling in the course, what you think of the course, and any special needs you have--for example, having to meet a tight deadline for completion of the course.

8. Carefully review each marked written assignment when it is returned to you. Whenever your work indicates the need for further study, do it before proceeding to the next lesson. If you receive an assignment that has no grade or a grade below 70, it will usually be marked "Correct and re-submit," or "C & R." After restudying the lesson material, you should redo the incorrect portions on separate sheets, making no changes on the original, incorrect work. You should send in both the intact original work and the corrected work to your instructor. The new grade you earn will completely replace the old grade.

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Midcourse Exercise. After mailing in the written assignment for Lesson 5, and before proceeding to Lesson 6, review what you have learned to this point. Then complete the Midcourse Exercise that follows the written assignment for Lesson 5 and mail it in for grading as you would a written assignment. When you have completed the exercise, proceed with Lesson 6.

Final Examination. The final examination is taken under local supervision. When you have completed the written assignment for Lesson 10, submit the Request for Final Examination form that you will find at the back of this Supplement. Then start reviewing to prepare for the examination, which will be a closed-book exam (you may not refer to any books, notes, or other materials) over the entire course. You will be allowed two hours to complete the exam.

Course Completion and Transcript. In order to complete the course with a passing grade, you must earn satisfactory grades on all of the written assignments, the Midcourse Exercise, and the final examination. A grade card with your final grade will be mailed to you. If you require an official transcript, use the special request form at the back of this Supplement.

Correspondence. All correspondence pertaining to the course should be sent to the following address:

Independent Study
University of Wisconsin--Extension
432 North Lake Street
Madison, Wisconsin 53706

HOW TO LEARN

Learning is an ordinary, common, everyday thing. Everybody does it almost all the time. It's impossible to stop learning. There's nothing strange about it even though, quite honestly, nobody really understands how or why it happens.

Each person learns as an individual, a student in a class as well as one engaged in self-study. And most of the learning that everyone does takes place outside of schools or educational institutions.

Introduction

To study simply means to direct your learning toward some particular goal. Here are some general guidelines for studying.

1. Set up a study time-schedule for yourself to suit your situation. Don't make it too demanding or too rigid, but don't be too lenient with yourself, either.
2. Choose a time and place that is convenient and reasonably quiet. Certainly, make a choice that will leave you as free from outside distractions as possible--perhaps late at night at home, or early in the morning at a library.
3. Organize all your study materials and have them at hand before you begin. Always include a scratch pad and pencil.
4. Begin your study of each lesson by a quick reading of the entire lesson. Don't worry about detail or about getting everything to make sense this first time. Then read the lesson over more thoroughly, keeping the lesson objectives in mind, studying and learning more detail, thinking things through. Get all the information you can from charts, maps, tables, and figures. Mark things up--things you find interesting, or important, or difficult. Use the scratch pad to keep track of questions that come to mind, or to outline what you're learning, or to make your own notes. After this second reading, you'll probably want to go back over all or part of the lesson, maybe several times. Stop occasionally to refresh your mind on the objectives of the lesson.
5. In the early lessons, do the self-examination when you feel you know the material in the lesson. Try to do it without looking back over the lesson. Then check your answers in the key. Grade yourself. If your score is less than perfect, you'll want to restudy all or part of the lesson.
6. When you are ready, carefully and thoughtfully complete the written assignment. Keep your written work neat and legible. It's a courtesy to your instructor and your work will be more useful to you in reviewing the course.
7. Before you start each new lesson, you'll probably want to give earlier lessons a quick review. Note that many of the words and terms introduced in the course have precise meanings. An important part of your study consists of increasing your vocabulary with these new words.

Introduction

8. Relate what you're learning to anything you can. Seek out other books or articles on weather and climate. Watch TV weathermen in your area. And get outside in the weather. Observe cloud formations, wind direction, dew, fog--whatever is happening. And there's always something happening with the weather.

Do things. Want to try cloud watching? Make yourself a list of various cloud types. Check off each type as you observe it. Or wind watching? Make a list of wind directions for various positions of lows or highs in your area. As you experience each condition, verify it and check it off your list. Or measure the rainfall where you live and compare it with the official reporting station rainfall. Or . . . Well, you get the idea. Every time you go outside, you get into the weather. Get your mind into it too by observing it and relating it to what you are learning in this course.

Lesson 1

THE FORMATION OF CLOUDS

WRITTEN ASSIGNMENT

Send in your answers to University of Wisconsin--Extension for grading, using the answer sheets at the back of this Supplement.

A. Multiple Choice

Choose the one best answer for each of the following.

1. The water vapor content of moist air by volume rarely exceeds
 - a. 50%.
 - b. 15%.
 - c. 5%.
 - d. 0%.

2. A middle cloud that appears as a thin, continuous sheet covering the sky is the
 - a. cirrostratus.
 - b. nimbostratus.
 - c. altostratus.
 - d. stratocumulus.

3. The highest sea-level pressure ever recorded on earth occurred in what type of area and season?
 - a. Subtropical deserts in summer
 - b. Near hurricanes in the fall
 - c. Interior of continents in winter
 - d. Ice-covered oceans in winter

Lesson 1

4. Some clouds do not precipitate because
 - a. no condensation nuclei are available.
 - b. air in the cloud is not saturated.
 - c. drops are too small.
 - d. drops evaporate before they condense.
5. When the water-vapor content of an air parcel remains the same, increasing the temperature will
 - a. increase the relative humidity.
 - b. decrease the relative humidity.
 - c. not affect the relative humidity.
 - d. increase the vapor pressure.
6. Increasing the temperature of air will not necessarily increase the air pressure because
 - a. the density of warm air is less than the density of cool air.
 - b. warm air rises and cold air sinks.
 - c. the density of warm air is greater than the density of cool air.
 - d. the air pressure does not depend on the air temperature.
7. Dewpoint is the temperature to which air containing water vapor must be cooled in order that it will
 - a. not evaporate.
 - b. become just saturated.
 - c. just begin to condense.
 - d. just begin to freeze.
8. The relative humidity can be decreased by
 - a. increasing the temperature.
 - b. decreasing the temperature.
 - c. increasing the dewpoint.
 - d. none of the above.
9. Which of the following would not be a representative measure of normal sea-level pressure?
 - a. 1013 mb

(Answers continue on the next page.)

Lesson 1

- b. 15 lbs per sq in.
 - c. 30 in. of Hg
 - d. 15 ft of H₂O
10. Which of the following cloud observations would be erroneous?
- a. Altocumulus at 10,000 ft
 - b. Cirrostratus at 19,000 ft
 - c. Cumulonimbus base at 1000 ft
 - d. Stratocumulus at 5000 ft
11. The principal constituents of dry air near the earth's surface are found in the following proportions:
- a. Nitrogen 71%, oxygen 28%, argon < 1%
 - b. Oxygen 78%, nitrogen 21%, argon 0.03%
 - c. Nitrogen 78%, oxygen 21%, argon < 1%
 - d. None of the above
12. The worldwide range of sea-level pressure is about
- a. 2000 mb.
 - b. 200 mb.
 - c. 20 mb.
13. According to the Gas Law, heating of an air parcel will reduce the parcel's pressure only if
- a. the density remains constant.
 - b. the density increases.
 - c. the density decreases.
 - d. the Gas Law is not obeyed.
14. An air parcel becomes saturated when
- a. it can hold no more liquid water.
 - b. the air temperature is above the dewpoint temperature.
 - c. the relative humidity is equal to 100%.
 - d. condensation nuclei are present.

Lesson 1

15. Vapor pressure is a measure of
 - a. the actual amount of liquid water in the air.
 - b. the relative humidity.
 - c. the dewpoint.
 - d. the temperature.

16. Air is supersaturated only when
 - a. the relative humidity exceeds 100%.
 - b. the relative humidity is less than 100%.
 - c. the temperature equals the dewpoint.
 - d. rain is falling.

17. Air generally cools as it rises because
 - a. air expands when lifted.
 - b. air compresses when lifted.
 - c. compressed air is cooler than expanding air.
 - d. air temperature is always cooler at levels above the ground than at the ground.

18. Which of the following cloud types would most likely be responsible for producing heavy rain?
 - a. Cumulus
 - b. Cumulonimbus
 - c. Altocumulus
 - d. Cirrocumulus

19. A rapidly growing cumulus cloud is referred to as
 - a. cumulus congestus.
 - b. stratocumulus.
 - c. nimbostratus.
 - d. nimbostratus.

B. Problems

1. Calculate the total weight of the air on a 3 × 5 ft desk top. Assume the air pressure is at its normal sea-level value.

Lesson 1

2. Using Table 1.3 of the text, calculate the relative humidity, in per cent, if the air temperature is 75°F and the dewpoint is 65°F .
3. Using Table 1.3, calculate the dewpoint if the temperature is 70°F and the relative humidity is 75%.
4. Again using Table 1.3, find the temperature if the relative humidity is 50% and the dewpoint is 55°F .
5. Using the data from Table 1.3, plot a graph of temperature vs. saturation vapor pressure. Let the range of temperature be from 0° to 100°F and the range of e_s be from 0 to 100 mb. Draw a straight line through the plotted points and extend the line over the entire range of the graph.
6. If you doubled the temperature of an air parcel from 40°F to 80°F , would you double the maximum amount of water vapor the air could hold before condensation took place? Show your calculations.



TEACHING AND WRITING INDEPENDENT STUDY COURSES

Guidelines for Teachers and Writers
of Independent Study Courses
Through the Correspondence Method

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University Extension
The University of Wisconsin

Published in cooperation with the Department of Commerce,
Independent Study, Editorial Services,
the Research and Design Team, and Staff Development

Acknowledgments

I am indebted for many of the ideas contained in these guidelines to the following people:

H. Rowland English, Professor Emeritus of Commerce,
who introduced me to the correspondence method

Charles A. Wedemeyer, the William H. Lighty Professor of Education,
who encouraged me through the years

Students, colleagues, course writers, and instructors
who broadened my horizon

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Price: \$2.00

PREFACE

These guidelines are for those who want to teach and write independent study courses using the correspondence method. The material presented here is based on years of practical experience in teaching and writing these courses and in helping others teach and write them. The emphasis is on the practical rather than the theoretical aspects of correspondence instruction.

Since you are interested in teaching or writing an independent study course, it is important for you to know that an instructor may or may not have written the course he will teach. Likewise, the course writer may or may not teach the course he will write. As an educator competent in your field of knowledge, you are undoubtedly anxious to achieve top-level performance. These guidelines will supply you with ideas, background, and hints that will help you to proceed with a measure of confidence and effectiveness.

Many areas of knowledge are cast into the mold of independent study courses, and variations exist in methods of presenting and teaching materials in different areas. What is true about the specifics of teaching or writing an accounting course, for example, is not necessarily true for a course in French or history or mathematics. Consequently an instructor or course writer, while following these fairly well-defined guidelines, should feel free to work within, and enjoy, wide latitude in interpreting and applying ideas contained in the following pages. The suggestions should serve as a guide, not as a rigid blueprint.

Part I presents historical and philosophical backgrounds of independent study. Part II deals with teaching a course. Part III suggests ideas about writing a course. If you have had little or no experience with this kind of course, you will benefit from reading all parts. If you have had some experience either as an instructor or a course writer, you may gain helpful new insights.

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Part I

INDEPENDENT STUDY
BACKGROUND AND PHILOSOPHY

The following two chapters introduce you to a brief historical background and some philosophical bases of independent study. These chapters will help you to understand independent study and increase your sensitivity to the correspondence method and your effectiveness as an instructor or course writer.

1. HISTORICAL AND BACKGROUND FACTS

Education through the correspondence method is known as correspondence education, correspondence study, correspondence instruction, home study, and independent study. There are probably other labels. In these guidelines, however, "independent study" is used because the National University Extension Association (NUEA), the recognized professional association in this area of education, uses this term.

A college or university that offers independent study courses is likely to have some kind of organization, however loosely arranged, known as a program, that involves courses, course writers, instructors, editors, course reviewers, artists, a course production unit (printing or duplicating services), and the necessary enrolling, recording, and mailing services.

An independent study course is the medium of communication and instruction between instructor and student. Its function is to guide the student through a field of study under competent instruction so as to help him master the subject matter of the course. It is, in effect, the link between instructor and student; it should provide for the independent study student what the classroom provides for the resident student.

Independent study has a long and honorable history. When you involve yourself in independent study either as an instructor or as a course writer you are well advised to acquaint yourself with some of its historical and philosophical aspects. A few facts, presented on the following pages, will contribute to your effectiveness as an instructor and as a course writer.

Origins

As an educational method, independent study originated many years ago, possibly in the exchange of letters that gave directions or instructions. According to Verner and Booth,¹ independent study was in use in Berlin about 1850. Touissant, a Frenchman, and Langenscheidt, a German, worked together to teach French and German by mail. Their method, involving translations and phonetics, is still in use today. In 1890, Dr. William Rainey Harper began a program of independent study at The University of Chicago. "The idea of . . . learning by exchange of correspondence between student and scholar . . . had its first expression at The University of Wisconsin in 1891."² By November 1, 1906, William H. Lighty "published an announcement of 150 courses to be offered by The University of Wisconsin Extension Division."³ Since that time, the Wisconsin program has grown continuously. Undoubtedly the same growth could be observed in many programs throughout the world.

Twenty-five years later, in 1916, the National University Extension Association (NUEA), composed of the extension divisions of various North American colleges and universities, was formed at The University of Wisconsin. Each biennium the Association publishes a booklet listing courses offered through independent study at member institutions. Presently (in 1968) sixty-four institutions in the United States, and some Canadian universities, hold membership in the Association.

Private Schools

Private schools, owned and operated by a person or corporation, have also been established and have grown and prospered. International Correspondence Schools at Scranton, Pennsylvania, is one of the best known. This institution has enjoyed a long career providing courses in many fields for many people. Other well-known private schools are La Salle Extension University, American School,

¹ Coolie Verner and Alan Booth, Adult Education (Washington, D. C., The Center for Applied Research in Education, Inc., 1964), pp. 69-70.

² Roger W. Axford, "W. H. Lighty--Fountain of Idealism," in The Brandenburg Memorial Essays on Correspondence Instruction, Vol. I, Charles A. Wedemeyer, ed. (The University of Wisconsin, Madison, 1963), p. 57.

³ Ibid, p. 58.

Industrial Training Institute, and Famous Artists Schools. These and other private schools are represented in The Home Study Review, a professional journal sponsored by the National Home Study Council.

USAFI

At the beginning of World War II, the United States Armed Forces Institute (USAFI) initiated a program of independent study for educating and training people in the Armed Services of the United States. This program was developed and expanded through the joint efforts of USAFI and universities in the United States. Today it provides educational services for the largest independent study school program in the world. The work of USAFI is carried on under several plans: (1) contractual arrangements are made with selected universities whereby courses are created at the request of, and according to the specifications of, USAFI; (2) arrangements may be made with specific book publishers for production of a course; and (3) some courses are produced internally at USAFI. Servicing of USAFI courses may be undertaken by selected universities or by educational specialists at USAFI. Hundreds of thousands of persons have benefited from these courses. Thousands are currently enrolled.

Business and Industry

Observations of the use of independent study in business and industry indicate more than casual interest in this medium. Several large international firms have used and are using University of Wisconsin independent study courses in their educational and training programs. Undoubtedly courses of other universities are being similarly used. A recent study⁴ of over 700 cooperating firms indicates that 56 per cent have used independent study courses from outside sources in their training programs and that 94 per cent of those using these courses plan to continue their use, while 32 per cent plan to increase their use of them.

Outlook

In general, this educational medium has established itself firmly in the educational system and has grown over the years. It is spreading rapidly

⁴A private study by Sharp & Oughton, Inc., a subsidiary of Kenilworth Corporation, Kenilworth, Illinois, 1968.

throughout the world while it is undergoing change and improvement in countries that have long used this method of learning."⁵ A study made by Charles A. Wedemeyer in June, 1965, indicated that "In the Netherlands, England, India, Africa, Germany, Belgium, Jamaica, Sweden, Norway, Denmark, Finland, Venezuela, Mexico, Trinidad, and the United States, there are increases in the interest and participation of official government agencies in the development, supervision, regulation, or approval of correspondence courses."⁶

There is still great potential for expansion. Recent experience at The University of Wisconsin indicates that many students residing in foreign countries are enrolled in independent study courses at the University. Currently (1968), students on all continents are enrolled. Air mail provides efficient lesson services. As more and more students in foreign countries enroll, awareness of independent study opportunities increases. Growth is likely to continue not only in numbers of students but, through evolutionary changes and innovations, in the medium itself. These latter elements depend largely upon the imagination of instructors and course writers. When you accept an invitation, an appointment, or a commission to teach or write a course, you are being challenged to work in a field of education or to produce a work that can have far-reaching effects.

Flexibility

Independent study provides great flexibility as to time and place. Students can enroll and courses can be started at any time without reference to the academic year, and courses can be made available at any place in the world that has postal service. A student's progress throughout the course is limited only by his initiative, his ability to assimilate, the time available to him, and the regulatory limitations of the college or university offering the course.

Courses are available at both high school and college levels. These include degree credit, noncredit, and vocational courses. Several universities offer

⁵Charles A. Wedemeyer, "World Trends in Correspondence Education." An essay adapted from Wedemeyer's keynote address at the Seventh Conference of the International Council on Correspondence Education, June 12, 1965, in Stockholm, Sweden. Published in Charles A. Wedemeyer, ed., The Brandenburg Memorial Essays on Correspondence Instruction, Vol. II (The University of Wisconsin, Madison, 1966), p. 2.

⁶Ibid, pp. 3-4.

graduate level courses. Degree credit courses offer college and university students the opportunity to be flexible in pursuing their objectives. A student can, for example, pursue a course during the summer without coming to the campus to enroll in summer school. During the regular term if his resident institution does not offer a needed or desired course, he can enroll in an independent study course offered at a distant institution and merely add it to his residence schedule of courses. Usually he must procure permission from his resident dean or registrar. Some noncredit courses are vocational in character, and employed persons may pursue them without leaving their jobs. High school courses provide similar flexibility.

The Role of Instructors and Course Writers

Observation and recent history indicate that instructors and course writers are as deeply dedicated as those in other areas of education. Prospective entrants into independent study are urged to familiarize themselves with the history of the independent study program at the institution that appoints them because the aims, objectives, and philosophies of that institution should necessarily be reflected in the work they undertake.

You can probably prepare yourself best for your task of teaching or writing by counseling with the director of the independent study program or with the chairman or coordinator of the department in which you are appointed.

2. PHILOSOPHY OF INDEPENDENT STUDY

Several well-founded philosophies and variations serve as the basis for independent study and the development of courses. The one that appears here has proved itself in over seventy years of evolutionary growth. The evolution is still in progress.

The Tutorial Relationship

Independent study may be regarded as personal tutoring by mail. It can be offered to anyone who can read and write, at any place in the world that has mail service. It can encompass highly sophisticated as well as simple material. It is not a mechanical process whereby a student places a check mark on a printed form to indicate his response or reaction to a problem or a question. Nor is it a system whereby an instructor merely puts a grade on a lesson and returns it to the student. There is no machine grading; machine-graded courses undoubtedly exist, but that is not what we have in mind here. In our view, an independent study course establishes a close personal teaching and learning relationship between student and instructor, for the student's benefit.

The tutorial relationship, which implies a tutor and a student, is as close a relationship as it is possible to achieve in the teaching and learning process. In our concept of independent study we try to bring this relationship into reality. This concept should become an essential part of your thinking as an instructor, because through the course you are creating the vital communicating link between yourself and the student. If this link is inadequate or faulty, the job of teaching through independent study becomes more difficult, and the learning process is impaired. Such impairment can discourage the student to the point where he may fail to complete the course. If you establish a successful tutorial relationship through your course, the student will probably be delighted and make highly gratifying progress.

The Student

The student must be considered to have sufficient ambition and initiative to want to work, with high expectations, on an independent study course. He should be regarded as sufficiently ambitious to want to complete the course successfully. He might need degree credit for graduation. He might be seeking promotion on his job, or he might be looking for certain information that will increase his skill. He is presumed to have no other convenient means of pursuing his objective, namely, of acquiring more knowledge from a recognized authoritative source under competent guidance.

The location or place of residence of the student is vital to his planning for more education. Although he may live in a large city that has one or more institutions of learning nearby, his time may be so consumed by earning a living that he cannot attend any local school in person. He may have a traveling job that precludes meeting a fixed schedule of classroom work. Or he may live in a small town, a rural area, or a foreign country that has no educational facility suited to his needs. He may be in the Armed Services; he may be on board a ship. Since it should be assumed that he has no library or reference works readily available, he should not be directed to use them. It is probably safe to assume that he has a dictionary, although in some instances he might not. To teach effectively, you must visualize the student clearly so that you expend your teaching effort not for him but rather directly to him.

The student is likely to be an adult who has a cultural interest in the course for its own sake, or he may be a young man busily engaged in a job where advancement can come only through greater knowledge or skill. He may be a foreign national who is anxious to broaden his horizon or gain a substantial idea of how Americans live. He may be a businessman who needs to round out and augment his knowledge to become a better manager, or he may be a high school student who needs the course to earn his diploma. He may be working in a shop or driving a truck. He may be unemployed, a patient in a hospital, a prison inmate, or even a housebound invalid.

The independent study student is probably self-motivated. He is a person who has decided, or who has been counseled, that independent study will help him solve his problems. The counseling might have come from a friend, a teacher,

or his employer--someone who has indicated the value of such a course. There may be some students who are prodded by someone to "take" a course, but they are doubtless in the minority.

Instructor's and Course Writer's Responsibilities

While the learning process is primarily the student's own responsibility, the instructor and the course writer are responsible for presenting the material of the course as effectively as possible. Any properly motivated student will learn something from even a mediocre course, but that same student will learn immeasurably more from a well-written and well-taught course.

There is probably no "best" independent study course. While you, the instructor or course writer, are presumed to have technical competence in the area of knowledge about which you are teaching or writing, the development of the material of the course is an artistic undertaking. No one can tell you precisely what you should do. The value of the fruit of your enterprise in teaching or writing a course depends on your skill in communicating and your outlook as a scholar.

You are expected to be reasonable in what you expect of the student and to be sympathetic to his problems and interests. This does not mean that you can soften or lessen demands on the student's capacity or ability to learn. There are certain objective minimum demands that must be made and met to satisfy the dimensions of the course.

Because of the practical availability on a world-wide scale of the course you teach or are going to write, you must realize that a great variety of temperaments and backgrounds will be represented among the students who enroll. You can safely assume that most students are probably working alone, with no instructor or fellow student nearby to whom they can readily direct questions. Cultural and educational backgrounds may vary widely. Some students will never have attended a college or university. Some might be high school dropouts. Ethnic and family traditions also play a part. Since students living in foreign countries are interested in knowledge that pertains, in some instances, to North American life and culture exclusively, their needs must be met by exposing them to this life and culture as exemplified in the course. It is important, therefore, to refrain from being apologetic or negative. The positive approach and the

optimistic outlook are definitely recommended. Situations must be presented objectively and honestly.

Writing down to students, adopting a patronizing attitude, assuming a benevolent posture, or indulging in sarcasm have no place in an independent study course. Delicate touches of humor may be permitted if the humor is not likely to be misunderstood; skill in portraying written humor is difficult, however, and rather than create ambiguities in the student's mind, the instructor or writer is probably best advised to refrain from its use.

Learning and developing a skill, acquiring knowledge, or investigating a new intellectual field are primarily and definitely responsibilities of the interested student himself. An educational institution functions to provide an environment for these pursuits. In independent study both the instructor and the course writer actively seek to produce this environment as an extension of the university campus.

You should be a teacher or a person who has had teaching experience. Ideally, you should have had experience in teaching through independent study. If you have had this experience you will have a good understanding and an intimate view of the problems encountered by students in this medium; you will also have an idea of how best to help students solve their problems, some of which are peculiar to independent study. If you have not had this type of teaching experience, a careful study of Part II will give you ideas that should prove helpful.

TEACHING THE INDEPENDENT STUDY COURSE

When we discuss teaching the independent study course, we assume that a well-structured program has been set up and is functioning effectively. High levels of teaching excellence and efficiency for which residence institutions strive are assumed to be goals of the independent study program.

The instructor and the study guide are complementary to each other in independent study. The study guide leads the way through the course; you, the instructor, provide instruction. You also supply animation and motivation, which are vitally important because their presence can produce an eminently successful course from the student's viewpoint. Without them, the course can be extremely dull. These qualities induce and encourage the student to continue the course, once he has started, and to complete it.

We properly assume that you are competent in your knowledge area, although you might not necessarily be experienced in this medium of instruction. We assume that you will be adequately equipped with necessary tools to teach and have a good working understanding of the mechanical operation of the programs. This understanding should be imparted to you before you begin to teach by someone in the program thoroughly familiar with its functioning. A briefing or orientation session should be your introduction to your teaching assignment. Even though this session is complete and well-managed, questions are bound to arise later. Consequently, you should feel free to ask questions at any time during your teaching appointment.

Teaching, in the broadest concept of the term, is an art. Teaching an independent study course is a somewhat specialized form of the art. Since we are dealing with an art, there is no intention, in these guidelines, of attempting to tell you how to teach. Neither is there any idea of suggesting or providing a definitive theory of teaching. Rather, the following pages contain ideas that will help you get started in this field. They should also prove useful as you become more deeply involved in independent study.

3. TEACHING THROUGH INDEPENDENT STUDY

Knowledge of comparisons, contrasts, and facts surrounding the peculiarities of independent study instruction can be extremely helpful to you before you begin to teach. Even the experienced classroom instructor, if he has not taught through this method, can probably gain much insight into independent study by considering some of the differences between this method and classroom instruction.

Differences in Students

Fundamentally, you must possess a keen realization of the fact that your students' learning situations are probably far from ideal. A student on campus has a conveniently located library and congenial companions who share his interests and with whom fruitful discussion is possible. He usually has sufficient time in which to pursue his studies. In contrast, an independent study student probably has meager library facilities, or none at all. He typically studies alone with little or no opportunity to discuss his work with others, and he probably borrows time for study from some other activity that might appear more alluring or even more necessary.

While distractions and interruptions are likely to be incidental to the campus student, they are of major importance to the independent study student; they are likely to be economic or military, and he must face them in order to live or to comply with discipline. Sometimes he lacks ability to plan adequately for himself; frequently he has family or job responsibilities that are unusually time consuming. He does not have a guiding hand nearby to help him organize for study. These facts do not imply that the instructor must make allowance for poor work. On the contrary, realizing the possibility of this situation, the instructor can approach his job with an attitude of unusual helpfulness which recognizes the difficulties faced by the student.

Discussion Atmosphere

Next, you must realize that the written lesson which comes from the student for reading, analysis, and grading is not a test paper. It is to be considered a written communication, much as a personal letter, between the student and you. It is not enough for you to supply little check marks, which can be meaningless, or merely to put a grade on the lesson. The written lesson provides the means for discussion between you and the student, and it should be treated accordingly.

To implement this idea of discussion, you should insert words, phrases, and sentences at strategic points in the lesson so that the student, when reading it, gets the sense of having participated in a discussion with you. By writing directly to the student, instead of about him or the lesson, you develop essential close relationships. A warm, friendly attitude is likely to result in a warm, friendly flow of language. The student will probably respond by exhibiting an increasing interest in the course and thereby increase the course's value to himself.

Reading the Lesson

You must read each lesson critically and with deep understanding. This means that you note each word, punctuation mark, dollar sign, decimal point, per cent symbol, and any other mark, with unusual care. This is no place for scanning or rapid reading. Since the student devoted considerable time and effort to composing and writing the lesson or solving the problem, you are obligated to read each word and mark carefully enough to get the full significance of what the student intended to convey.

More than one reading of the written assignment might be necessary for you to do it justice. The student's mode of expression will not necessarily be what you are accustomed to; and the student should not be penalized merely because he sounds "different." This does not mean that you should accept poor work or carelessly written material. Although you may not be teaching an English course, you should indicate necessary structural corrections. The student must realize that there is a minimal level of expression, in any course, that must be maintained in order for him to be understood. While penmanship cannot be corrected beyond a polite request to write more legibly, misspelling and incorrect expression should be corrected.

Instructor's Comments

All suggestions, constructive criticism, or other clarifying comments, words, or marks must be written legibly. They usually appear in the margin, between the lines, or on the reverse side of the lesson sheet. An "Over, please" should be supplied for the student's convenience. In some cases you might wish to supply additional sheets for your comments. You should feel free to do so. At no time should you write over the student's composition.

If you are proficient in typing, you are encouraged to supply typed comments. Plenty of space is available for these on the reverse side of the student's sheets. Students no doubt will appreciate typed comments from you as much as you appreciate typed lessons from students.

No student should ever be required to guess about or wonder what you have written or what you mean. Comments must be clear in thought and expression as well as legible.

It is imperative for you to realize that all lessons require comments. The less-than-excellent lesson will naturally receive comments, but the excellent lesson, rating the highest grade, should also contain them. The excellent lesson indicates that the student's concept of the material is in fairly close accord with your ideas, but while a grade of "A" indicates excellence to the student, it gives him nothing more than confirmation of the fact that he has performed excellently. More than confirmation is necessary.

Since you are presumably more knowledgeable about the subject matter of the lesson than the student is, the excellent paper necessarily is not likely to contain all the background of knowledge that you possess. Comments should therefore be added to the excellent paper to widen the student's knowledge and understanding. This is true teaching, and it supplies enrichment for the excellent student.

The below-average lesson requires particularly careful attention. You should attempt to discern why the lesson is poorly done. Failure to follow instructions set forth in the study guide, lack of study, lack of care in attempting to understand what the questions are actually about, lack of ability to communicate, carelessness, lack of interest are all reasons for a poor lesson. There are

probably others. You should attempt to indicate or imply, in carefully chosen language, a possible reason and suggest a remedy. At no time should accusations be made.

Your attitude should be one of friendly helpfulness. You project this attitude through suggesting a mode of attack on the lesson material rather than by writing out a model solution for the student. In some instances a model solution might be valid, but it should not be the solution to the precise problem under consideration.

The student should never be subjected to ridicule for performing at a less-than-average level. In extreme cases where the student is quite obviously beyond his depth, you might diplomatically recommend a change in courses. (Under regulations at Wisconsin, dropping one course and enrolling in another involves minimal financial loss to the student.)

Comments must be positive and encouraging. Since there are no tones of voice or facial expressions to temper and build the instructor-student relationship, comments must be chosen wisely. General terms such as "fine," "excellent," "good," while acceptable in some places in the lesson, should be used sparingly in favor of specific comments. An exception to this, perhaps, is the first lesson, where a general note of commendation or encouragement seems advisable. You might write, for example, "You've made a good start because . . ." and then go on to give a reason for your comment. Other than this, comments should pertain directly to the material at hand. If you feel you are writing directly to the student, your remarks will create an image of yourself that will help the student accept and understand you, and even admire you.

Comments should be sincere and unambiguous. Sarcasm, facetious remarks, and reactions of severity should always be avoided. Since humor is ordinarily difficult to express, it should not be attempted because of the possibility of misunderstanding. If the student supplies humor you might react reasonably to indicate close rapport, but it would be well to tone your reply to one close to the lesson. Adhering closely to the subject matter indicates to the student that the material is important and there is little time for anything other than the lesson.

Questions

As you read the written assignment, you might wish to ask a question that has not been asked in the assignment. Asking a question is a sound teaching device. A well-framed question can be better than a statement, but at no time should your questions be designed to increase the student's difficulty.

You might ask, for example, "Why?" or "What is your basis for this answer?" The question can be designed to make the student realize that a reason should have been supplied to complete his answer. Then, instead of leaving him in doubt about the answer, you can supply an answer, imply one, or suggest where an answer can be found by more study. In most cases, implying the answer or having a student dig a little deeper for it is probably better procedure than answering the question directly.

You should be ready to answer the student's questions, not as a substitute for his own work but in answer to sincere inquiries. You must realize that you are probably the only person to whom the student can appeal for help in clearing up a real difficulty. The definition or usage of a technical word for which the dictionary definition is not sufficient might well fall in this category. You will not only explain the word but you will point out its uses in the pertinent situation or context.

Evaluating the Lesson

Each written assignment must be evaluated and graded. Since your professional judgment enters intimately into the evaluating and grading process, experience indicates that review of your grading methods when you enter independent study teaching may be profitable to you. There is no intention here of interfering with your freedom to grade; rather, these ideas are intended to help you set your own guidelines.

Since students have been conditioned, throughout the entire education process, to expect grades on their work, you should realize that each grade is important to each student. Each grade is regarded as a measure of his accomplishment, and it is no wonder that he waits for the return of his written assignment with an attitude of expectancy. He might even entertain anxieties about it.

Above all, the evaluation should be accurate and the grade a fair reflection of that evaluation. It should be your conscientious appraisal of the student's

work. Since each independent study program has its own system of grading, you must be well informed about it. Information about the system should be imparted and discussed at your initial briefing session.

Depending on the discipline involved and the peculiarities of the course, a written assignment may be of such a nature that an appraisal can be made of it in its entirety. Most assignments, however, contain a number of parts composed of questions, problems, cases, or induced expressions of ideas. Assume, for example, that an assignment contains five parts. Each part, if graded on the basis of 100 points, could be worth 20 points unless each question carries some other specified value. It should present no special problem for the instructor to decide whether one of these parts is correct or incorrect. This is his function. If the part is incorrect, the assignment would be discounted 20 points. It is not sufficient, however, merely to indicate -20. A reason for the discount should be indicated with a comment giving a clue to the means available to the student for learning the correct answer.

There are cases where only a fraction of one of the parts is incorrect. The question then arises, should the entire part be discounted or should only that measurable fraction be discounted? It would seem, in fairness, that the measurable part should be discounted. So if one half of that part, for example, is incorrect, the discount should be only 10 points. Experience indicates that the independent study student, probably because he does not have face-to-face communication with his instructor, reads his returned assignment very carefully and is most conscious of what the instructor discounts.

Since each independent study program has its own system of grading, the grade put on the assignment--a number, a letter, or some other mark--will be one selected from the system. You will be supplied with information regarding this by your program director.

Occasionally a student will submit an assignment which is not complete. He might have omitted some parts deliberately or through error. He might, for example, have solved two of three problems or answered seven of ten questions. You might be tempted to return the lesson marked "Incomplete" without further comment. To do so, perhaps, is a waste of time.

You could grade the work as it appears, but in the case of two problems submitted out of three, if both those completed were perfect, the grade could be

less than the passing grade. Thus the student might be penalized for an oversight not connected with course content.

It is probably preferable to read and evaluate, with comments, the portion that was submitted, indicating that some part is missing and asking the student to resubmit the whole, completed assignment for further comment and grading. The student will thus benefit from contact with you and not lose the time during which his assignment was in your possession. The grade will still be "Incomplete" until he resubmits the assignment.

The Instructor's Special Role

You have a special job that requires the utmost discernment in evaluating the student's total achievement. You must recognize the student's mechanical and intellectual difficulties, and you must help him cope with them. You must realize that you can build a discussion atmosphere by choice of words and that you must build it to help the student. You are probably the only person who can motivate the student to progress as a student.

With a proper understanding of the elements discussed above and with a resolution to utilize them in contacts with students, you can be reasonably certain that you are doing a good job of teaching.

4. MECHANICAL ASPECTS OF INSTRUCTION

Any human enterprise needs certain tools, devices, processes, or methods for successful operation. Independent study needs only a few, but their presence is imperative if this method of education is to succeed.

Tools

You should be adequately supplied with instruction materials. You should have a textbook, a textbook publisher's instructor's manual if one is available, the course study guide, a solutions manual prepared by the course writer, any necessary reference works that might aid you in teaching, any audiovisual materials necessary for the course, a dictionary, and colored pens or pencils.*

You are well advised as time goes on to increase your supply of tools by making marginal notes in the study guide and the textbook concerning your experiences with your students or the course. Encounters with students are two-way communication processes, and the prudent instructor will broaden his knowledge of the course by observing and recording students' reactions that might be valuable to him. These observations and notes have a twofold purpose. They broaden your background and enhance your ability to teach future students, and they can be useful in the revision of the course.

Your need for these tools is self-evident. The suggestion of a dictionary might seem to imply that you are expected to correct misspelling and improper usage. An instructor might be unwilling to spend time making such corrections, if he is not teaching a course in English or a field such as communications or journalism. This attitude is probably justifiable, but regardless of the nature of

*It is imperative that you write your comments and corrections in a color contrasting with the student's written work. Ordinary lead pencil should not be used, as there is danger of smudging.

the course, the fact of the misspelled word should be indicated to the student with the admonition that he consult his dictionary.

Since no textbook can be expected to contain all of the possible ramifications of an area of knowledge, your reference works should include other textbooks in the field. You may consult these when a student submits ideas or raises questions concerning points not covered in the course textbook. Textbooks in related fields can frequently be helpful.

Written Assignments

Assignments from the student will come to you through the system set up in the program: They may come directly to you through the mail, or you may pick them up at the independent study office. Regardless of the method, it is highly important to realize that they will probably come on a daily or an almost daily basis. Once an independent study program is launched and students are enrolled, the flow of assignments becomes as relentless as the tides of the seas.

Volume of work, measured by the number of individual assignments, is a matter of negotiation between instructor and the program director. No instructor should be overworked, and he should not take on more work than he can handle comfortably. Only personal experience with a particular course can be the real or ultimate determinant of your work load. You must bear in mind that each assignment represents the effort and expectations of a student who is presumably deeply interested in it. You can be no less interested, and you indicate this interest by undivided and sufficient attention to each assignment.

Time

The time which elapses between the dispatch of the assignment by the student and its return to him is critical to the student. He has done his work and he is understandably anxious about how well he performed. This fact suggests that you should not delay performance of your task once you receive the student's assignment. Ordinarily five to seven days is considered a reasonable period for grading. No student should be kept waiting several weeks to get a response to his assignment. The fact is, however, that this unfortunate experience has been suffered by some students; the result is discouragement and disillusionment. An

independent study program usually has a standard time period, set up on the basis of experience, allotted for grading. This standard must be strictly observed.

You can usually meet the time standard by arranging your schedule as you would if you were meeting a class at an appointed time, in a certain place on campus. Granted that the volume of independent study assignments varies, usually unaccountably, a definite time should be set up for instructional purposes.

Records

You must maintain appropriate records of students' assignments. The independent study program will have a system to which you will be introduced. It should be observed meticulously for your own benefit as well as the students'. Since accidents occur in the mail, and it must be remembered that independent study depends greatly on the postal system, you are strongly urged to maintain a duplicate set of records. In some instances compensation for instruction depends on reports based on records. This fact is a compelling reason for maintaining adequate records.

Instructor's Office Management

You should be conscious of the need for proper office management. You should provide yourself with adequate office space and equipment. The full-time instructor has no problems in this regard because independent study instruction is his only responsibility. For the part-time instructor, however, problems sometimes arise. The point involved here concerns the proper management of the incoming and outgoing assignments: They must not be misplaced or lost. No apology or expression of regret can replace a lost assignment.

In Conclusion

Independent study programs function with considerable enthusiasm. Educators and other personnel in all phases are usually dedicated individuals whose primary concern is the education of others. You can share in this dedication and the satisfaction it brings by consciously setting goals that will enable you to grow as an instructor.

Part III

WRITING THE INDEPENDENT STUDY COURSE

There is something singularly deceptive about the seeming simplicity of producing any fine piece of work, whether it be a building, a book, a piece of machinery, a symphony, or a painting. The architect, the writer, the producer, the engineer, or the artist seem to have taken certain fairly simple steps to produce their work. We know, however, that such is not the case. Each creation or production is the result of many hours of planning, designing, calculating, and executing that are not readily apparent. Much slow, painful effort probably was expended.

A good independent study course is probably similarly deceptive. A prospective course writer might ask, "How much work is involved?" or "How much time does one spend writing a course?" There is no unqualified answer. The following pages give some indication why this is true.

5. INDEPENDENT STUDY COURSE COMPONENTS

An independent study course consists, usually, of three elements--a textbook or textbooks,* a study guide or syllabus, and an instructor. A textbook serves the same function in independent study as it does in the classroom. In some instances where no textbook is available or where there is no suitable one, the study guide becomes the sole tool of the course. Most courses, however, are based on textbooks.

The Textbook

You, the course writer, may or may not have a voice in the selection of the textbook. Whether you do or not depends on the policy of the academic department of the institution for which you are writing the course. If you do not have a voice, you simply accept the assigned book; if you do, you should seek a book of recent publication date, which is clearly written and covers the material adequately from the viewpoint of your objectives. You are well advised in your consideration of textbooks to confer with one or more faculty members who have reviewed, or are acquainted with, books under consideration for the course.

Date of publication is important. The most recently published textbook has the advantage of longer life than the older book; once a book is revised or goes out of print, the useful life of the study guide depreciates rapidly.

Clarity in a textbook develops the student's confidence by indicating to him that it is quite possible for him to understand what he is reading without undue strain. Clarity also reduces the number of comments or explanations you need to make in the study guide to explain difficult or obscure passages. Always bear in

*A course writer need not necessarily limit himself to the use of one textbook.

mind that the student is assumed to have no one to consult personally and that he must rely on his textbook and his contact, by mail, with his instructor. To him, clarity is of the utmost importance.

Since the textbook is expected to supply the student with most of the material of the course, one that contains much illustrative material is highly desirable. A book that contains chapter summaries and problems, questions, or cases at the ends of chapters has the advantage of providing a broad scope of material for the inquiring student and of supplying you with some ready-made questions and problems. No course, however, should consist of questions and problems taken solely from the book. You should supply some of your own. This is one of your unique contributions to the course and your opportunity to update the textbook. Because of the time lag in publishing, a textbook necessarily cannot be expected to be precisely current, especially in a rapidly changing or developing field.

If a textbook is not used, other materials such as manuals or pamphlets may be utilized. The fact of continued availability is as important for these materials as for the textbook. If and when they become unavailable, the study guide becomes valueless.

The Study Guide

The study guide is the publication that you prepare. Its function is to guide the student through the course. It offers broad opportunity for expression of your ideas and imagination. Its writing allows full freedom to your abilities to prepare a highly useful book. Details concerned with writing the study guide appear in Chapter 6.

If no textbook, manuals, or pamphlets are used, the complete course must be contained in the study guide. This places on you the responsibility for writing much or all of the material. You might be tempted to reprint entire articles from other sources in the study guide. This should be avoided whenever possible. The best procedure, when you feel it is necessary to draw on a source such as an article from a periodical, is to extract the major points from the article and to explain them completely in your own words. If you must include direct quotation, quote only those brief sections that you feel are absolutely essential for the student to see in the original wording. For material quoted at length, you must seek permission from the publisher, and sometimes from both publisher and author.

Seeking and obtaining permission is your responsibility. In all cases where material is drawn or quoted at length from another source, permission should be procured before the study guide manuscript is submitted for editing so that letters of permission can accompany the manuscript to the editor. Careful observation of this point can save considerable time.

Some publishers expect a fee for permission to quote from their publications. If so, you will be notified. However, to avoid unnecessary correspondence between you and the publisher, when the manuscript is being prepared for nonprofit purposes, as for a college or university program, you should indicate this fact in your letter requesting permission to quote. Except in unusual instances, publishers may be said to be generous in their policies of permitting quotations without charge. (See Appendix B for sample letters requesting permission.)

Reprints of articles are sometimes available in quantity lots at nominal prices. If reprints are to be used in the course, it is important that a sufficient number of copies be procured at the outset to satisfy the needs of the course for the foreseeable future. Additional copies might not be available later, and if reprints cannot be procured, the study guide becomes valueless unless it can be revised to incorporate new material.

You may wish to use a chart, drawing, graph, map, or table from a periodical. Such illustrative material is often helpful to the student. However, you should keep in mind that reproducing this type of material frequently involves the services of an artist. A chart, graph, or drawing in black and white with no screens (gray or shaded areas) can be picked up photographically quite simply from clean, sharp original copy. More complicated art cannot. If you wish to use any material that must be redrawn, you should inform the editorial department of this during the planning stage, so that they may make suggestions or arrangements for the artwork to be done. You should be aware that use of illustrative material from published sources also requires the permission of the publisher.

Charts, graphs, and line drawings which you supply must be exact, although they may be proportional in size. Lines and points in mathematical drawings must be precise. If the statement is made that line AB is perpendicular to line CD at point X, for example, the drawing representing that fact must be absolutely without error, otherwise the draftsman who prepares finished artwork will be misled and become confused. Preprints of a variety of maps are available for use in courses requiring them.

Supplementary Materials

While the textbook and the study guide are basic in the construction of an independent study course, additional elements might make the course more instructive or interesting. These elements include books of supplementary readings, pamphlets, booklets, reprints of journal or magazine articles, tapes, records, pictures, diagrams, charts, graphs, slides, and any other audiovisual aids that might lend themselves to the building of a strong course. It is imperative that any elements built into the course be readily available to the student either on a loan or purchase basis and that the student have facilities for using them (such as a tape recorder for playing tapes). Most important, they must be mailable. It is advisable to consult with postal authorities if there is any doubt as to the mailability of any component of a course. Careful consideration should be given to the cost to the student when more material than a textbook or two is likely to be used. For example, \$35 or more for textbooks and supplementary materials might be considered reasonable for a course in investment banking, whereas that amount for books for a course in business letter writing or algebra might be prohibitive.

Supplementary media may be desirable additions to or integral parts of an independent study course. The Educational Telephone Network (ETN) is available in Wisconsin and probably in other states or areas. Subsidiary Communications Authority (SCA), which is part of the FM radio broadcasting system, also might be useful in the preparation of a course.

These media are mentioned to indicate the broad range of means available to you for reaching students. While insufficient space prevents detailed discussion here of these media, they should be considered with regard to courses in foreign language, for example, where verbal communication is important. Inquiry should be directed to the appropriate authorities in charge of these media.

The Instructor

The third element in an independent study course is the instructor. Since your sole function is to write a course, you have no control over the selection and appointment of the instructor who will teach the course. You can assume only that the instructor will be a person competent in the field covered by the course.

It is your function, however, to supply an answer key for the written assignment questions. The answer key should contain directions to the instructor about the level of expected student performance, solutions to problems, and suggested answers to questions. The nature of the course will determine the nature of the key. Mathematics and accounting keys, for example, will contain precise solutions. Keys to English and history courses will contain statements of what the instructor should look for. Comparative values of various questions and problems should be indicated to aid in grading.

In the case of USAFI courses, you will submit the manuscript for a solutions manual to USAFI with the study guide manuscript. For Extension independent study courses, you will probably be asked to make available a key or manual of solutions informally within your department. If a self-examination for the student is part of your study guide, you should include a key to self-examinations in the study guide itself.

You will probably gain insight into the independent study instructor's role by reading Part II of these guidelines. This insight should prove helpful in your task of writing.

6. WRITING THE STUDY GUIDE

The study guide is the publication that the student probably regards as "the course." It has a descriptive title and includes a contents page, an introduction to the course, and the lessons or assignments. It is the "work" that you produce.

Before beginning to teach a course, the classroom instructor prepares a plan for his course. He divides the total material of the course into convenient and workable segments so as to cover it completely within the time allotted. The independent study course writer must perform a similar task. He must divide the course material into lessons or assignments so as to cover it within the confines of the study guide.

You should draw up a detailed outline of what you intend to put into your course. The outline should enable you to visualize the material of the course accurately in its entirety before you begin to write. A reliable rule of thumb is to put into each lesson about as much material as might be covered in a week of classes meeting three or four hours. Considerable elasticity is possible here because of the wide variety of knowledge areas that can be encompassed in the whole field of independent study courses. Some types of material require more time and space than other types. In any event, you must weigh both logical and psychological factors in planning your course.

Careful planning of the material of the course and segmenting it into lessons do not imply that changes cannot be made as the course writing progresses. On the contrary, changes in planning and writing can be made at almost any stage of the writing process before editing. Although you should feel free to shift material to suit your purpose, such changes cost time which might be conserved through careful planning.

The study guide directs the student through the course. Since the path must be unmistakably well defined, writing the study guide requires skill and care to achieve clarity. The written material must not only be readily understood but be incapable of being misunderstood.

The title printed on the cover is the name of the course. It should be descriptive and appealing to the student and should be chosen with care. In some cases the title is self-evident or is the same as that of the residence course; in other cases it might require considerable thought. Listing several possibilities from which to choose can be helpful.

The title page usually contains the course name and number, the writer's name and title, any statement of authority under which the course was written, and the name of the university offering the course. The amount of degree credit, if any, should be indicated on this page.

The contents page lists the lesson titles of the course. These titles should be apt descriptions of the material covered in the lessons.

The introduction should give the student an overview of the course and contain a statement of course objectives. To be easily understood, it should be written in fairly simple language. It should display an attitude of optimism and encouragement and tend to whet the student's appetite to begin work. It should raise his hopes that the knowledge contained in the course will truly benefit him.

The introduction should also contain instructions about the mechanics of the study guide (how to do the work). These instructions should remove any elements of strangeness the student might feel. They should contain step-by-step suggestions for study and should be sufficiently detailed to minimize questions. A key to the lesson grading system should be included so that the student can intelligently evaluate his progress in the course.

A short biographical sketch of the course writer might also be included in the introduction, if this seems desirable or necessary. An art course, for example, may be enhanced if the student knows something about the artist who prepared the course. The names and positions of prominent professional men who may have assisted in the preparation of the course can also be mentioned here.

Lessons or assignments comprise the bulk of material that appears in the study guide. Taken collectively they are the body of the course. A course might have as few as five or six lessons or as many as forty. At The University of Wisconsin, eight lessons generally represent one degree credit. Therefore, a three-credit course usually contains twenty-four lessons, although some courses contain fewer. Each lesson typically contains the following elements:

1. Lesson (or assignment) number and title
2. Introductory section
3. Reading assignment
4. Study notes or comments
5. Self-test questions or self-examination
6. Written assignment

Lesson Title and Number

Each lesson should have a number and title which is descriptive and preferably short. It should suggest, in capsule form, what the student will find in the lesson. Parallelism in lesson titles throughout the study guide adds a subtle note of strength to the course. While parallelism is not always possible, an effort should be made to achieve it. A few well-chosen words in the title are more meaningful to the student than many words carelessly selected.

Introductory Section

The introductory section should be an integral part of the lesson. It should give an overview of the lesson and tell the student what to expect and what he should learn or accomplish. It should be long enough to accomplish these aims but not so long as to be boring. Several paragraphs will probably suffice in most cases. Even one well-written paragraph might be enough. It should be informal and conversational if possible. Introductions can serve as connecting links between lessons, indicating how past lessons are related to those that are forthcoming. This use of the introduction will insure continuity and will help the student view the course as a unit rather than as a series of unrelated lessons.

Reading Assignment

The reading assignment indicates to the student the material in the textbook and elsewhere that he is expected to read. It should give chapter numbers or page numbers or both. Assignments to read supplementary materials should be made here.

Study Notes or Comments

Study notes are your comments and observations on the reading assignment. They consist of statements that explain, clarify, augment, or correct those made in the textbook. (If the course has several books, the study notes can also point up relationships between the viewpoints in them.) Comments are always valuable, because the textbook author and the course writer are different persons whose viewpoints are not identical. Study notes are often keyed to the page numbers of the textbook for easy reference.

At this point your experience and competence in your field come into play. You point out the significance of the reading assignment and indicate real meanings and relationships that might not be immediately evident to the student.

Explanations, elaborations, modifications, and corrections are the fabric of good teaching. The student will welcome them because they enable him to understand quickly the material at hand. Modifications and corrections are somewhat less easily presented than explanations and elaborations. Diplomacy and delicacy are required so as not to undermine the student's confidence in the author of the textbook. Corrections may be presented as differences of opinion, which might truly be the case, or as additional ideas. Natural evolution in a field of knowledge which makes the author's statements obsolete must be indicated as such.

If the textbook contains an error or inaccuracy, this will have to be acknowledged. To dodge the issue would cast doubt on the accuracy of the study guide. Typographical errors should be indicated as such.

At no time should you flatly contradict or even imply a contradiction that would degrade or ridicule the author. To do so effectively destroys the student's confidence in the textbook and possibly in the course.

Illustrative problems and their solutions can logically be included here. If applicable they represent the teacher in action in a somewhat dramatic form.

Self-test Questions

Because a student in an independent study course is working alone, he needs a device that enables him to check or test his acquisition of knowledge. Self-test questions fill this need. They follow immediately after the study notes.

Self-test questions should be based directly on the text material, so that the student can test his understanding of what he has read. They are answerable from the text. An answer key is ordinarily supplied at the back of the study guide so that the student can check his responses easily and quickly. Merely listing questions from end-of-chapter material is not enough. Self-test questions also can be used as a teaching device (in the same spirit as programmed learning), in which case the answers need not be widely separated from the questions. It is assumed that a student in an independent study course is sufficiently mature to attempt seriously to answer these questions before consulting the key.

Written Assignments

The written assignment is the student's opportunity to express himself and the instructor's means of determining what the student has learned. It is prepared by the student and submitted to the instructor; it is the first communication between student and instructor after the student has completed his preparation of the lesson and should be an expression of his best thought about the contents of the lesson. The written assignment differs markedly from a student's classroom communication with an instructor, in that the student in the classroom probably answers only one question. In the written assignment he answers all required questions.

The questions of the written assignment differ significantly from the self-test questions. They should be framed so as to be unanswerable directly from the textbook. They should test the student's understanding and knowledge and require that the student analyze, synthesize, or apply what he has learned. They may be essay, true-false, multiple choice, completion, or a combination of any or all of these. The word "discuss" should be avoided because its use permits too great an opportunity for the student to stray from the point. Strive for something more explicit. Your ingenuity is involved here because the written assignment is part of the learning experience.

Examinations

Although course examinations (both final and mid-course) are not usually integral parts of the study guide, they are usually parts of the course. In some instances, a nonsupervised mid-course examination might be included in the study guide. The mid-course examination may be considered as a sample of what the final will be. Some departments feel that an independent study examination is so different from one in the classroom that it is unfair to subject a student to a final without giving him an indication of what it will be like. For this reason some departments actually ignore mid-course examination grades when computing course grades. Since you have prepared the course and are intimately acquainted with it, there is no lack of logic involved in expecting you to prepare examinations for it. Local program policy will guide you.

Final examinations are to be administered under the usual academic conditions by a supervisor or proctor. Directions for applying for final and mid-course examinations are included in the study guide. A standard format, not your concern, is ordinarily used.

Professionalism

At all stages of your work on the course, you should be deeply conscious of the fact that you are engaged in a professional task. Since you are about to produce a professional product, you should bring to this task all knowledge, ingenuity, and care of which you are capable. You should realize that the same care required in preparing any work for publication, be it a professional journal article or a book, is expected here. Since the study guide will carry your name, you will want to be proud of it.

7. PREPARATION OF THE STUDY GUIDE MANUSCRIPT

Your interest in your manuscript extends to several related functions. They are editing, the technical review, the editor-writer conference, and the production of the study guide as a finished product.

Editing

Since the manuscript will be edited professionally, your time and the editor's will be conserved if you have a clear-cut notion before you begin to write of the style expected of you in preparing the manuscript. You should familiarize yourself with mechanical requirements. A careful perusal of current study guides and a discussion with the person under whose direction you will write and with the editor are highly recommended.

The manuscript should be clearly and neatly typed, with a margin of approximately one inch on all four sides. Some course writers who type their own manuscripts have a tendency to type too near the bottom of each page and to have a right-hand margin that is narrow and unusually uneven. The manuscript should be typed on a good grade of 8 $\frac{1}{2}$ " by 11" white bond. Carbon copies and manuscripts typed on Corrasable bond are not acceptable for editorial purposes. All typewritten material should be double spaced. If a passage is to be printed single space, it should nevertheless be typed double space and marked in the margin for single spacing. This provides room for editing and also makes the task of typesetting easier for the printer.

The manuscript pages should be numbered consecutively. Pages that have to be added to the body of the manuscript later should be numbered a, b, c, etc., such as 76a, 76b, 76c. Pages should be submitted "loose"--that is, not stapled or clipped together.

To guard against loss, and to facilitate working with others during the production period, be sure to prepare a few carbons of the manuscript or to have copies duplicated and in your possession. They can be useful to you for review, for making changes that might be necessary after the manuscript has been submitted, and for conferring with the editor by phone.

Correct spelling is important, especially where technical words or expressions are involved. While it is important that the language be clear and precise, and that grammatical construction be as nearly correct as possible, it is well to remember that the editor will help improve clarity of expression after the manuscript has been submitted. Your highest skill is technical competence in the field in which you are writing; an editor contributes to that skill by helping you improve your ability to communicate. You should bear in mind that the editor takes great care not to change meaning; he intends only to improve clarity of expression. You will have the opportunity to check through your manuscript after editing and to discuss with the editor any changes that might be suggested or sections that need clarification.

Everything that should be in the study guide must be included in the manuscript when you submit it. You cannot expect the editor to supply material which you have merely indicated that he "pick up" from a certain source. It is your responsibility to make final decisions about what appears in the course and what does not appear. In a real sense, the course is your very own.

In your final reading of the manuscript before submitting it for editing, it is permissible to insert a few necessary last-minute changes or a few corrections, but they should be minimal. At some point, usually here, you must regard your work as final.

You may be asked to submit one or two paragraphs describing the content of your course. This material is used for promotional purposes, including the answering of student requests. As you write your course, you may decide what to include in this "course description." It is to be submitted with your manuscript.

Technical Review

After the manuscript has been submitted to your program director and before it is edited, it will be reviewed by a person competent in the subject matter field. The reviewer is usually a faculty member.

The reviewer's function is to examine concepts and ideas in the study guide and to make suggestions for possible improvement or change. You will receive a copy of the reviewer's report and will have the opportunity, if you wish, to discuss the report with him. After changes or corrections are made, the manuscript is submitted to the editor.

Editor-Writer Conference

After the manuscript has been edited, you are called to confer with the editor. In some instances the editor may return the edited manuscript to you for review before the editor-author conference. This is a time-saving procedure, and you should not regard it as an opportunity for making extensive last-minute revisions. You also must not alter any editorial markings without first discussing them with the editor, because any changes you make at this point may introduce inconsistencies or other problems into the manuscript. At the same time, you will find the editor eager to correct any misconceptions or errors still existing in your manuscript. At the conference the editor discusses with you every item about which there is a question. The editor is interested primarily in clarity of expression; he is concerned with technical content only from the viewpoint of the student's understanding of it. It is important for you to realize that you are the author and are ultimately responsible for the content of the course.

Production of the Study Guide

After the editor-writer conference has been held and both parties are satisfied that the manuscript has reached the ultimate stage of perfection, the manuscript becomes the responsibility of the compositor and printer. Necessary artwork, including cover design, is the responsibility of an artist. You might wish, however, to express your ideas about art to the editor or artist.

You may be called upon, although not necessarily, to give opinions about binding, number of copies that should be printed, and any ideas that will aid in launching the course successfully.

Just before the camera-ready pages are sent to the printer, the editor will give you the opportunity to check through them to correct any errors they might contain. Since alterations at this point are costly, rewording merely for the sake of making a passage read better cannot be permitted. However, a serious error corrected at this stage may eliminate the need for an errata sheet after the book is printed.

Copyright

Usually the institution copyrights the study guide, but in some cases copyright ownership is vested in the writer. Each instance of publication has its own peculiarities. To prevent any misunderstanding about copyright ownership the writer should be certain that there is clear agreement about this important aspect of course writing.

Compensation

Course writing by faculty members is usually considered part of their regular work load compensated by their salaries. Ad hoc course writers are paid a stipend for a completed manuscript of a course. Payments may be made in installments over a period of time as work progresses or upon acceptance of the completed manuscript. The amount of compensation and method of payment should be clearly understood.

8. COURSE REVISION

All independent study courses eventually require revision. New knowledge and new concepts appearing in new or revised textbooks, new methods, and improved modes of communication are reasons for revision. Weaknesses discovered in the present course by an alert instructor will suggest, and be sufficient cause for, correction or revision. Minor corrections can be made in a current course by inserting correction sheets in the study guide. Revision is a major operation.

Revision includes adapting the study guide to a new or revised textbook and updating the study guide to conform to various changes that have occurred in the subject matter field. An example is changes in the income tax law, which are probably annual. A change in the program's concept of the type of student to be served is reason for revision.

Present Course

Because of the existence of the present course, your task as the course reviser may be less difficult than the course writer's. It is important to note that you may or may not have been the writer of the course to be revised. If you are, then your task is less difficult because you are thoroughly familiar with what you wrote originally. You can proceed along the same path that you followed when you wrote the course. If you were not the writer, then the job is somewhat more difficult.

The first step is to familiarize yourself with the course. This includes a careful reading of the present study guide and a survey of new textbooks and materials that have emerged since the course was written. This survey logically includes letters to publishers, publisher's representatives, and authors of textbooks inquiring about the status of books possibly destined for revision. It sometimes happens that publication of a new edition is imminent, possibly within

the next six or eight months, although an announcement might not have been made of the fact that the book is undergoing revision. Such information is obviously of great value in planning revision of the study guide.

The survey should also include, if possible, any notes or ideas that instructors have regarding the efficiency of the present course and its possible improvement. In some instances, the instructor will be the reviser, in which case he will have had much experience which he can bring to bear in the revision.

Revised Course

If you did not write the course originally, your task is practically the same as the original course writer's, except that you have a nucleus with which to begin. You are well advised to familiarize yourself with the information in the preceding three chapters of these guidelines.

To improve the course markedly, revision may involve changes even in format. Remember that you are not bound to a pattern that is sacred. As a scholar you should feel free to make any changes that will enhance the course. Remember that you are producing the course for the benefit of the student.

APPENDICES

The following appendices are included as a guide for instructors and course writers new to Extension and, it is hoped, will provide new insights to those already familiar with correspondence instruction.

Appendix A contains sample pages from study guides of courses currently offered by University Extension, The University of Wisconsin. These pages illustrate points covered in the text and indicate the wide latitude that is possible in course design.

Appendix B contains copies of letters requesting publishers' permission to quote.

Appendix C is the roster of the National University Extension Association (NUEA) members for 1968-69. It is included to indicate the extent and range of development of independent study in institutions of higher learning in the United States and Canada.

APPENDIX A
SAMPLE PAGES FROM CURRENT STUDY GUIDES

Sample Title Pages

Sample Introduction

Sample Assignments

Commerce

English

French

Civil Engineering

(Sample Mathematics Title Page)

Mathematics H40

PLANE TRIGONOMETRY

A High School Credit Course . . . $\frac{1}{2}$ Unit

By James D. Moore
Teaching Assistant in Mathematics
University Extension
The University of Wisconsin

Critically reviewed by
Richard Y. C. Lee
Teaching Assistant in Mathematics
University Extension

University Extension
The University of Wisconsin
Independent Study

(Sample History Title Page)

History 201

AMERICAN HISTORY, 1492-1865--THE ORIGIN AND
GROWTH OF THE UNITED STATES

A College Course . . . 3 Credits

By Norman K. Risjord
Associate Professor of History
The University of Wisconsin

Prepared under the supervision of
The Department of History,
University Extension,
The University of Wisconsin

University Extension
The University of Wisconsin
Independent Study

INTRODUCTION

Not only in England, but in the rest of the Western world, the nineteenth century is the Great Age of the Novel. If the term celebrates the novel's triumph, it also reverberates with a wistful, elegaic echo: Then it's all over? Certainly now in our own day, amongst the critics at least, the burning questions seem to be: Is the Novel dead? If so, who killed it? And their accusing fingers oftener than not point straight at those Victorians you will be reading in this course, who never suspected that in their heroic labors lay the seeds of the novel's decay and death. It is possible that what drives our own contemporaries to such a frenzy of deprecation is, as much as anything else, the Victorian novel's monstrous self, row upon leatherbound row of it, quite secure in its achievement and not a little smug in its conviction of its own immortality. In the history of English literature, at least, only the great age of Elizabethan and Jacobean drama can make anything like a similar claim to such superiority, and even there such a claim owes a preponderant debt to just one man, Shakespeare, while the nineteenth-century novel is the accomplishment of many.

The Victorian novel is irresistible, irresistible in a way that has never been satisfactorily explained by even the most high-powered critics. The great novels of the twentieth century--Ulysses, The Rainbow, The Counterfeiters, The Magic Mountain, The Sound and the Fury--were, from the moment they appeared, anathema to a lot of people, many of them highly intelligent and perceptive. But the greatest of the nineteenth-century novels have from the beginning been hailed as things to be praised--and loved. In their own day they were regarded first of all as marvelous entertainments, and, second and no less important, as embodiments of sound moral instruction. As you will find, the novels are as entertaining as ever, but for one reason or another the moral instruction is just barely acceptable to us now. And

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yet our affection and admiration for these Victorians far outweigh the momentary repugnance we feel for their occasionally smug authoritative air in matters ethical and moral. Actually, enough time has passed now for us to see what the Victorians could not see themselves--that just like everyone else's world theirs, too, was built on sand. The social, economic, political, and literary historians have revealed to us the "other" Victorians in all their secret shame, and we are sad that the truth is out--but not surprised. Sad, because the world they dreamed of is still only a dream; not surprised, because the shadow of their misgivings about that dream is, if we look closely, there in their novels for all to see. Finally, more than anything else, we are touched that they tried so hard to be both happy and good, scolding each other, lecturing, cajoling, filling volume after volume with their recipes for felicity.

"Make 'em laugh, make 'em cry, make 'em wait!" Wilkie Collins advised Dickens, a shocking program for a serious novelist, we may think. And yet, as programs go, it is perhaps closer to the pattern that life itself takes than anything else you can manufacture and put into nine short words. What more do we ask of life, even now in this our own hard-bitten century, but that we be allowed to laugh a little, to cry--and to be given something to wait for?

TEXTS

The book you are now reading is the Study Guide for English 460. It attempts to provide the same type of help that a teacher would in a classroom.

The only text that you are required to buy is Walter Allen's The English Novel: A Short Critical History (hereafter referred to as Allen, English Novel), a Dutton Everyman Paperback, D9. You may purchase this book from University Extension.

Since almost all the assigned novels (these are listed in the table of contents) are available in many different editions, both hard-cover and

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paperback, no particular editions are suggested. All of them may, however, be borrowed from University Extension Library, should they not be available locally. When ordering, please enclose a check or money order payable to University of Wisconsin Extension.

Below is a suggested list of general readings about the novel, particularly the nineteenth-century English novel. In addition to this, a highly selective list of suggested reading follows the study notes for each novel and novelist.

SUGGESTED READING

As well as Walter Allen's The English Novel, which you are asked to buy, the following books about the English novel are recommended to supplement the required reading.

Baker, E. A. The History of the English Novel. 10 vols. New York, 1924-1938.

The largest, most exhaustive, most unquestionably "standard" work on the novel.

British Writers and Their Work, Number 9. Lincoln, Nebraska, 1960.

Includes essays and good bibliographies of Disraeli, Thackeray, Dickens, and Trollope.

Cecil, Lord David. Early Victorian Novelists. New York, 1935.

Includes discussions of Dickens, Thackeray, the Brontës, Trollope, and George Eliot.

Cross, Wilbur L. The Development of the English Novel. New York, 1899.

For many years the standard work on the novel. Since it is nearly as old as the novels it treats, it has a "contemporary" flavor--and that is now its main interest for us.

Mord, Boris, ed. From Dickens to Hardy. The Pelican Guide to English Literature, Vol. 6. London, 1958.

An excellent, inexpensive volume which offers (1) notes on the Victorian scene, (2) notes on the literary scene, (3) full-length individual essays on the major writers (including Dickens, Thackeray, Trollope, the Brontës, George Eliot, and Hardy), and (4) a bibliographic appendix and suggested reading list.

Forster, E. M. Aspects of the Novel. New York, 1927.

A great novelist himself, Forster writes engagingly of other novelists.

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Kettle, Arnold. An Introduction to the English Novel. 2 vols. London, 1951-1953.

Leavis, F. R. The Great Tradition. New York, 1954.

The "great tradition"--says Leavis--includes Jane Austen, George Eliot, Henry James, and Joseph Conrad. The back of his hand to everyone else!

Lubbock, Percy. The Craft of Fiction. New York, 1957; Compass Books.

Originally published in 1929, this small volume created a big revolution in the way we look at novels.

Neill, S. Diana. A Short History of the English Novel. New York, 1951.

To quote its own jacket: "A lively survey of how the English novel developed, from its beginnings to the works of Lawrence Durrell and Samuel Beckett."

Thomson, Patricia. The Victorian Heroine: A Changing Ideal, 1847-1873. New York, 1956.

Tillotson, Kathleen. Novelists of the Eighteen-Forties. Oxford, 1954.

Van Ghent, Dorothy. The English Novel: Form and Function. New York, 1953.

Brilliant and stimulating (often perverse and occasionally impenetrable) essays on eighteen novels. Among them are Great Expectations, Vanity Fair, Wuthering Heights.

Wagenknecht, Edward. The Cavalcade of the English Novel. New York, 1954.

In the literature, both primary and secondary, of the Victorian novel, Wagenknecht has read as widely as anyone living.

NOTES ON PROCEDURE, PREPARATION, AND PRESENTATION

The preparation of an assignment in this course consists of reading the material indicated under the heading "Readings"; studying the "Study Notes"; and writing out a report according to the directions given under the heading "Written Assignment" at the end of each assignment. This report should represent your best abilities in reading, thinking, and writing. Besides competence in these respects, a good report shows the following characteristics:

1. The answers in discussion questions are always on the point designated by the written assignment. To write on the point, you should examine the written assignment carefully to make sure just what it calls for and then organize the ideas and facts pertinent to the subject into a coherent statement or discussion.

Introduction

2. Generalizations are always supported by specific evidence--citation, quotation or other demonstration.
3. Quoted material is used chiefly for the purpose above; in discussion questions, quotation does not substitute for your own ideas and expression and should not occupy more than one third of the discussion.
4. Direct quotations are always quoted accurately, enclosed in quotation marks, and acknowledged. That is, you should give the author's name, the title of the work, and the page on which the quoted passage occurs.
5. Indirect quotations are similarly acknowledged but are not put into quotation marks. The indirect quotation may not perhaps use the author's phrasing word for word, but it always expresses his idea accurately.
6. The good report is neither too long nor too short. Too brief a report may make unexceptionable statements and yet be unsatisfactory because it does not reveal the extent of your understanding; however thoroughly you may have mastered the material, you cannot be given credit for your accomplishment unless you write fully enough to disclose it. Too long a report is generally one that is extended by useless repetition, excessive quotation, or irrelevant issues. The good report is as long as is necessary for a well-substantiated, economically phrased coverage of the written assignment.
7. However good in the respects listed above and in content, a report that violates the conventions of literate writing by frequent misspellings, incorrect grammar, neglect of the elementary rules of punctuation, or incoherence resulting from the misuse of words or disorganized sentence structure has less merit than one written with the competence expected of a student with the prerequisites for this course, freshman English and six credits in introductory literature.

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PRINTED FIRST SHEETS

Printed first sheets are supplied by University Extension. One should be carefully filled in and used as the first page of each of your written assignments. Also furnished by University Extension are printed envelopes which should be used for mailing your written assignments. Use a separate envelope for each assignment.

After you have received a grade on all the assignments, you may mail the request for final examination, which is included at the end of this Study Guide. If you have an "incomplete" on any written assignment, the final examination will not be sent until this deficiency has been made up.

(Sample Commerce Assignment)

Assignment 6

MARKETING AND THE ULTIMATE CONSUMER

Marketing, it has been suggested, begins and ends with the ultimate consumer. This assignment analyzes this ultimate consumer from a behavioral viewpoint, and in it you learn that individuals behave differently, sometimes motivated by economic considerations and sometimes by emotional ones. The assignment also examines the relation of demographic characteristics to consumption.

Reading Assignment

American Business: Chapter 19, pages 401-422

Supplementary Reading: "The Challenge to Modern Marketing," Study Guide

Study Notes

Page 402, paragraph 2.* The classification of buying motives as either rational or emotional is perhaps an unfortunate historical development. There are many marketing men who believe this traditional and arbitrary classification is largely misleading and inaccurate. Simply giving thoughtful consideration to a purchase is not a sufficient criterion to indicate a rational buying motive. Motives, it is maintained, are responses to needs, and it is rational behavior to attempt to satisfy them. Some of these needs are physical, some psychological or emotional, some economic, while some, probably most, are any combination of physical, psychological, and economic. The distinction, then, as to the nature of the buying motive is based on the need being responded to.

*The first complete paragraph on a page is paragraph 1.

Assignment 6

Consumer responses to physical and psychological needs have largely been classed as emotional buying motives and consumer responses to economic needs as rational motives. In contrast to the emotional motives, rational motives are primarily concerned with making the most effective use of the customer's scarce resources. A product which is easier to use or clearly lasts longer, at lower cost, accomplishes this purpose.

Page 406, paragraph 3. It is important to realize that price is only one element in the marketing mix. Groceries, although they constitute a class of low-priced products, are sold on the basis of convenience, selection, ease of preparation, quality, and a pleasant purchase environment, as well as price.

Page 407, paragraph 2. As products become more dependable, guarantees become much less important as an inducement for consumers to buy. For untried products and services, guarantees are important elements in the effort to market them.

Page 410, paragraph 2. The patronage motives just discussed are similar to the rational motives for buying products. The selection of a particular store may also be related to psychological drives not yet fully understood. The Chicago Tribune study of social class in Chicago showed that people match their own values and expectations with the status of the store. Not all people want to shop at glamorous, high status stores. A lower status customer knows he will be punished in subtle ways by clerks and other customers if he goes to an exclusive store. The shopper does not wish to go to a store where she does not fit and is apt to stay away if the appeal is not clear-cut.

Supplementary Reading

THE CHALLENGE TO MODERN MARKETING*

By Arno K. Kleimenhagen and Clifford E. Larson

Note: Two former marketing practitioners, now serving the profession as educators, offer a thought-provoking analysis of the basic

*Reprinted from Sales/Marketing Today, the official journal of Sales and Marketing Executives--International, for June, 1967.

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Issues raised by marketing's increasingly vociferous critics, calling their rebuttal marketing's greatest challenge. This, they emphasize, can be accomplished by focusing our talents and energies on valid contributions to society and the betterment of mankind everywhere.

With increasing frequency, marketing is coming under intense criticism. Critics are questioning its relevance as a useful force in society, and, of course, continue to engage in the perennial questioning of its ethics. To some extent marketers have, through their writings and public statements, invited the attacks to which they now find themselves subjected.

By focussing on problems of an individual firm or industry, and often speaking with an unfortunate choice of language, they have projected--to many outside the profession--an image which tends to attribute unethical, if not immoral, motives and practices to those engaging in sales and marketing.

The challenge that modern marketing faces is the necessity to come to grips with the basic issues raised by its critics. As a starting point, it is necessary to re-examine the true significance of marketing. This should be done from the broadest of all possible views--the contribution that the marketing function makes to society.

Society's task is caring for the needs of people. Marketing, as an integral part of society, shares this task. Obviously then, the better marketing performs its function, the better society's goals are served. It is well known, but perhaps only to those who engage in marketing, that marketing's focus is on service to the consumer. This is true whether the consumer is a firm or an individual. Success in marketing is largely measured in terms of service. The better the quality of service, the greater the satisfaction to the producer, as well as to the user. It is the continuing ability to produce satisfactions that leads to profits and survival in a free enterprise society.

The critics of marketing invariably attack marketing on grounds of ethics and relevancy. Marketing is the alleged lair of wheeler-dealers, con-men and shoddy-goods distributors. Paraded in profusion, and with great fanfare, are the experiences of those who have been prodded into purchasing unneeded items by these people.

Marketing men recognize the realities of the world. To deny the existence of such individuals would be folly and most certainly untrue. But to transfer the motives of such individuals to the goals of the entire profession is to promote an image which is anything but deserved. By focusing on marketing's contribution to society, one is left with little doubt that devoting one's life to this task is in the highest traditions of mankind.

Marketing is also accused of being responsible for the diversion of scarce resources into production of goods for frivolous consumption. To cast marketing in this role of a satan whose goal is mankind's moral destruction is certainly unfair and most certainly credits marketing with greater powers than it now possesses. Marketing does not develop

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techniques calculated to push unwanted goods on uninterested individuals. Rather the focus, as suggested by the marketing concept, is to develop goods to better satisfy the needs of the society it serves.

Many marketing critics obviously bemoan the gradual change in wants by large numbers in our society. Individual wealth has permitted the individual in ever greater numbers to indulge himself, and the critics look with great disfavor on his choices.

Marketing, by serving the individual, is accused of seducing the individual and separating him from greater responsibilities. Curiously, by responding to the wishes of the consumer, marketing is supposedly guilty for his so called "moral downfall."

Marketing, if properly conceived, is a function which must be performed by all agencies within a society, not only by the profit-making businesses in the world's more affluent societies. Included, too, must be the function as it could also be performed by society's non-profit organizations if resources are to go into solving the problems of economic development, urban renewal and racial conflict.

It is with this expanded concept that marketing can answer its critics and, at the same time, solve its own persisting and perplexing problem: how to attract promising and capable people to it.

Elaborate surveys are not needed to verify that marketing's image with many young people today is not one with which they can identify. If marketing men can sell themselves and the significance of marketing to this audience they will accomplish two important tasks. First and most important, they will find increasing progress in recruiting high-quality future business leadership. Secondly, they will silence their critics by removing the basis for their criticism.

The challenge placed before marketing is clearly defined. Marketing must broaden its operating philosophy. Marketing men can no longer focus narrowly on products, customers, prices, promotion and sales, but rather must focus on their concern for the individual and mankind. They must assure that efficient performance of the marketing function goes far beyond the profit motive.

The growing complexity of the production process leads inevitably to the need for better marketing and better marketing tools. If marketing is the business of caring for the needs of people, to what nobler activity could one devote a life.

Self-Test Questions

1. What is meant by the statement, "The customer is king"?
2. What are "buying motives"?
3. Are emotional buying motives irrational motives? Explain.

Assignment 6

4. What are patronage motives?
5. In what ways is income related to consumption?
6. What is the relationship of population to consumption?
7. What is meant by "brand loyalty"?

Written Assignment

1. List four major trends in U.S. population--for example, "a growing segment of the population is over 65 years of age." Then explain how each of the following types of retail stores might be influenced by each of the trends:
 - a. Supermarket
 - b. Hardware store
 - c. Drugstore
 - d. Department store
 - e. Drive-in theater
2. What is the basic difference between rational and emotional buying motives? Is any use served by classifying motives in these two categories?
3. Read the Business Chronicle, "Decision: What retail outlets can best handle a new product?" page 421, and answer question 3 at the end of the case.

ASSIGNMENTS 12 AND 13

READINGS

Emily Brontë, Wuthering Heights

Allen, English Novel, pages 223-229

STUDY NOTES

It appears a wild fancy indeed to suggest that Wuthering Heights has anything in common with Pickwick Papers. Yet the two novels are alike in this: from the standpoint of criticism and explication they are both very hard nuts to crack. They offer themselves to all the modern critical apparatus, historical-psychoanalytical-mythical-semantic, but when the operation is over, there they stand quite untouched by all these attempts to explain them.

This is particularly true of Wuthering Heights. In his Aspects of the Novel E.M. Forster classifies that novel as "prophetic," because in it, he says, "...the emotions of Heathcliff and Catherine Earnshaw function differently to other emotions in fiction. Instead of inhabiting the characters, they surround them like thunder clouds, and generate the explosions that fill the novel from the moment when Lockwood dreams of the hand at the window down to the moment when Heathcliff, with the same window open, is discovered dead." In The Great Tradition F. R. Leavis announces in the first sentence of that thorny volume, "The great English novelists are Jane Austen, George Eliot, Henry James, and Joseph Conrad." But even he cannot cast Emily Brontë into outer darkness without a word. He acknowledges her to have been a genius, but, he says, "I have said nothing about Wuthering Heights because that astonishing work seems to me a kind of sport!" (The exclamation point is mine.) Herbert Read, in comparing Charlotte and Emily Brontë, finds "the psychology of Emily is at once less complex and more profoundly hidden. She

Assignments 12 and 13

is one of the strangest geniuses in our literature, and her kinship is with Baudelaire and Poe." In an essay which attempts to domesticate or Victorianize the Brontë sisters, Richard Chase rather goes out on a limb and then saws it off, when after quoting Read's remark about "the amazing quality of innocence" in the Brontës, especially Emily, he says, "And it is true that they do not always seem to be fully aware of what is going on in their own novels."

Such a sampling of critical opinion about Wuthering Heights does suggest perhaps not so much confusion in the minds of the critics, although it does suggest that, but rather a kind of awe--and bafflement. But, as you will discover, the bafflement comes only after you have finished the novel. While you are reading it, it does not occur to you to question anything.

There are strong mythic elements in Wuthering Heights: the Yorkshire setting, in which the principal characters of the drama are isolated from the rest of the world; the close blood-relationship of the protagonists in the novel; the motifs of blood revenge and thwarted passion acted out with violence, both physical and emotional; the sense, from the start of the novel, of a "house" (in the Greek sense of the word) with a curse upon it; and finally, of course, the superhero Heathcliff--a combination of sadistic demi-devil, Teutonic war-god and Niebelung, Byronic lover, and shrewd hardbitten Yorkshireman. Mythic though it appears to be, at the same time Wuthering Heights is perhaps the most intimate novel of the nineteenth century, for no other novel goes so far in presenting a relationship so deep and so nearly unfathomable as that between Heathcliff and Catherine. The great climactic scene in Chapter Fifteen, just before Catherine dies, is a projection into human language and human image of a kind of paroxysm of feeling between two people, preternatural yet almost infinitely complex and subtle, that is quite outside the experience of most of us--and, we know, of Emily Brontë herself. Yet it is, for us, encompassable, because it was for her. Would it have been so if she had not been "fully aware of what was going on" in her novel?

This intimacy is present partly because the author has anchored her narrative firmly in the person of Nelly Dean, a Yorkshire woman who now,

Assignments 12 and 13

as she tells her story, is in her middle age but who has lived alternately at Wuthering Heights and Thrushcross Grange since the parentless "gipsy" child, Heathcliff appeared at Wuthering Heights many years before. But she is not telling her story to us--as Jane Eyre did--but to Mr. Lockwood, a gentleman hailing not from the North country, but from the sophisticated South of England, and whose interest in the fortunes of the Earnshaws and the Lintons is finally one of not much more than intense curiosity. As the new tenant of Thrushcross Grange, which as the story opens Heathcliff now owns, Lockwood pays a visit to Wuthering Heights and is forced to spend the night there. His experience then leads him to find out from Nelly Dean, now housekeeper at Thrushcross, the story of what has led up to the appalling situation he found at Wuthering Heights that day and night. As in a proper epic, then, Wuthering Heights begins in medias res, with Lockwood's account of this night. Then, with Catherine's account of her own and Heathcliff's childhood that Lockwood finds in the Bible in the bedroom in which he spends the night at Wuthering Heights, with Nelly Dean's continuing narrative, with Isabella Linton's letter to Nelly, with the verbatim record of the young Catherine Linton's experiences at Wuthering Heights when she visits young Linton there, with what Lockwood finds upon his last visit--with all of this the circle is completed, the circles, really, which have moved outward concentrically and relentlessly from the stone dropped into the center of the still pool at the start when Mr. Lockwood with such bright irony has pronounced the moors in which he finds himself "a beautiful country!... A perfect misanthropist's heaven."

As her sister did in Jane Eyre, here in Wuthering Heights Emily Bronte has managed to strike the note of authenticity through her narrators, a garrulous old maid with almost total recall and a rather tiresomely, self-sufficient "foreigner," who is himself not a little spinsterish. Since they are telling the tale, the author can, as it were, stay out of it. We feel that the novel, as critics have suggested time and again, seems to have written itself, and this feeling we have about it is reflected in our own uncertainty about our reactions to it: at one and the same time it seems to have nothing to do with us--and everything!

Assignments 12 and 13

For example, Nelly's simple-hearted concern about Heathcliff's fitness for heaven throws into sharp relief what she calls, as she describes his last hours, his "goddless indifference." Her remark sends us unerringly back to that moment at the beginning of the book (but acutally, as the time sequence is organized, only a few months earlier) when after Mr. Lockwood had told him of his dream of a ghost Heathcliff cried out, "Oh! my heart's darling; hear me this time, Catherine, at last!" With a shock we recognize our own indifference now to traditional patterns of religious feeling and thought, our own indifference to anyone's fitness for heaven. What this pair were and are to each other is all that matters.

But, then, what are these two? They are those elemental forces, forces of value in the human condition, which cannot be destroyed--unless they choose to destroy themselves. Which, of course, they do. In the perfection of their relation to the moors which they love so, in the glory of their rebellion both against the effete lushness of upper-class life at Thrushcross Grange (as they peer through the window at it) and against the vindictive savagery of the sadistic Hindley, in the splendor of their mockery of a society which would control them, in their very oneness, they have found the key to the universe. The world is theirs. And they throw it away. Like Shakespeare's Antony and Cleopatra. But unlike Antony and Cleopatra, they allow themselves to be separated not by war or some kind of cosmic catastrophe, but by economics and social status. Heathcliff has neither money Edgar Linton has both; Cathy chooses Linton. And her decision destroys her and, somehow worse, destroys Heathcliff, transforming him in the end into, in Nelly Dean's words, "a savage sarcastic face." If all tragedy communicates, if nothing else, a desolating sense of waste, then Wuthering Heights is a tragedy.

Before closing these two strange novels, we cannot do better than quote some remarks of the poet Swinburne about them. While no more successful than the next one at explaining how they did it, he does in a rather grandly rhetorical paragraph come close to assessing what it was that the remarkable Brontë sisters did.

Assignments 12 and 13

The gift of which I would speak, is that of a power to make us feel in every nerve, at every step forward which our imagination is compelled to take under the guidance of another's, that thus and not otherwise, but in all things altogether even as we are told and shown, it was and it must have been with figures set before us in their action and their suffering; that thus and not otherwise they absolutely must and would have felt and thought and spoken under the proposed conditions.⁷

SUGGESTED READING

Kettle, Arnold. "Emily Brontë: Wuthering Heights," in An Introduction to the English Novel, Vol. 1. New York, 1960.

Van Ghent, Dorothy. "On Wuthering Heights," in The English Novel: Form and Function. New York, 1953.

Note: For other books about Emily Brontë, see the list of suggested reading which follows the study notes on Charlotte Brontë.

WRITTEN ASSIGNMENT

1. If Jane Austen had lived to read Wuthering Heights, what do you think she might have said about it? (It will add some spice to your answer if you are tempted to make it sound as if Jane Austen had written it!)
2. Using the following as a definition, discuss Wuthering Heights as a tragedy.

Tragedy is that in which life and death, the exclusive fulfillment of passion and the self-destruction which inevitably accompanies it, are inextricably fused.
3. A Marxist critic has found the driving force in Wuthering Heights to be the struggle for wealth and for the power that accompanies wealth. In interpreting this novel, how far do you think one can go in granting this to be its central theme?
4. If you were required to give a prize to one or the other of the two novels--Jane Eyre or Wuthering Heights--to which would you give it? And why?

⁷Algernon Charles Swinburne, A Note on Charlotte Brontë (London, 1894), p. 13.

LESSON 6

I. GRAMMAR

In Chapter 4 of Par les grands auteurs, study I-IV inclusive, pages 37-46. First go over the grammar points; then do the exercises.

NOTES:

- A. Compare the present indicative of avoir with the endings of the future:

j'ai (-ai)	nous <u>avons</u> (-ons)
tu <u>as</u> (-as)	vous <u>avez</u> (-ez)
il <u>a</u> (-a)	ils <u>ont</u> (-ont)

- B. The future translates "shall" or "will" plus the meaning of the verb, but "shall" is used only when the subject is "I" or "we."
- C. Similarly the future perfect translates "shall have" or "will have" plus the meaning of the main verb, but "shall have" is used only when the subject is "I" or "we."
- D. Be sure to read carefully 2) and 3) on page 240.
- E. In connection with the position of adjectives (Appendice 8d), you will note that some adjectives have one meaning when they precede the noun and quite another when they follow. The rule is this: When an adjective has both a literal and a figurative meaning, it is placed after the noun for the literal meaning, and before the noun for the figurative. Study the examples under 4) on pages 220-221.

F. Under Revision de verbes (page 43), observe the very common idiom venir de plus infinitive. This idiom is used only in the present and in the imperfect, thusly:

Il vient de parler.--"He has just spoken." (Literally, "He is coming from speaking" and therefore he has just done so.)

Il venait de parler.--"He had just spoken." (Literally, "He was coming from speaking" and therefore had just done so.)

II. READING

In Par les grands auteurs, read Femmes de Paris, pages 47-48.

Notes on Reading:

Page 48, line 5: humeurs--"moods"

8: l'art de se faire respecter--"the art of commanding respect"

9: toute--"any" (Have you noticed the various meanings of tout?)

22: esprit--"wit" (Have you noticed the various meanings of this word?)

WRITTEN ASSIGNMENT

1. In Par les grands auteurs, do the odd-numbered sentences of I-IV, pages 37-46 (top).
2. Answer the even-numbered questions of VIII, pages 48-49. (You may refer to the text for this exercise.)

Assignment 3

TRIANGULATION (CONTINUED)

Reading Assignment

Articles 10-29 through 10-40 in the text

Study Notes

Approximate Adjustment of a Quadrilateral. The approximate method of adjustment of a quadrilateral is the method that is covered in this course. This subject is quite thoroughly explained in Article 10-30 of the text and in the example problem on page 323. You should study this carefully.

Computation of Lengths and Plane Coordinates. You should study carefully Articles 10-31 and 10-32 of the text, paying particular attention to the example problems.

Reduction of Slope Distance by Station Elevations. Reduction of slope distances to sea level is explained in Articles 10-36 and 10-37 of the text. The following problem illustrates the method used when the station elevations are known.

Illustrative Problem

Trilateration station A is at elevation 1080 feet above mean sea level and station B is at elevation 3750 feet. The distance between the two stations was measured electronically and found to be 15,728.50 meters. The line lies in latitude 45° approximately, where the earth's radius is 6,378,240 meters. Reduce the slope distance to mean sea level.

Assignment 3

Refer to Fig. 8 below.

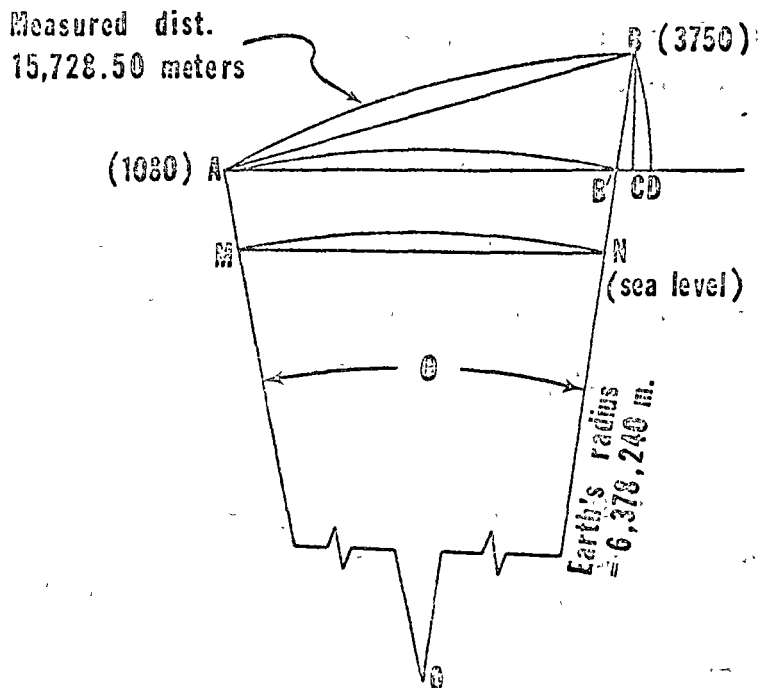


Figure 8

Solution:

By Equation 2-3 of the text (revised Equation 10-24 to include second term):

$$CD = \frac{\Delta h^2}{2G} + \frac{\Delta h^4}{8G^3}$$

$$CD = \frac{\left(\frac{3750 - 1080}{3.2808}\right)^2}{2(15,728.50)} + \frac{\left(\frac{3750 - 1080}{3.2808}\right)^4}{8(15,728.50)^3}$$

$$CD = 21.053 + .014 = 21.067 \text{ meters}$$

$$AB' = 15,728.50 - 21.07 = 15,707.43 \text{ approximate}$$

By Equation 10-19:

$$\sin \frac{\theta}{2} = \frac{AB'}{2R} = \frac{15,707.43}{2(6,378,240)} = .0012313$$

By Equation 10-25:

$$B'C = \Delta h \cdot \sin \frac{\theta}{2} = \left(\frac{3750 - 1080}{3.2808}\right) \cdot .0012313 = 1.002 \text{ meters}$$

Then,

$$AB' = AB - (B'C + CD),$$

$$AB' = 15,728.50 - 1.00 - 21.067 = 15,706.43 \text{ meters.}$$

Reducing AB' to the sea-level length MN ,

by Equation 10-22:

$$C_1 = AB' \frac{h_A}{R} - AB' \frac{h_A^2}{R^2}$$

$$C_1 = 15,706.43 \left\{ \left[\frac{1080}{3.2808} \right] - \left[\frac{1080^2}{(3.2808)^2} \right] \right\}$$

$$C_1 = 0.811 \text{ meters}$$

Finally,

$MN = 15,706.43 - 0.81 = 15,705.62$ meters, which is the sea-level length of the measured line AB . (Note: There are 3.2808 feet per meter.)

Written Assignment

- In the quadrilateral represented in Fig. 9 on the following page, all angles were measured with the same degree of precision and the results were as follows:

Angle	Value	Angle	Value
1	$56^{\circ}24'10.0''$	5	$25^{\circ}18'16.8''$
2	$33^{\circ}53'35.0''$	6	$58^{\circ}54'57.5''$
3	$62^{\circ}03'27.6''$	7	$37^{\circ}02'04.4''$
4	$58^{\circ}44'39.0''$	8	$27^{\circ}38'46.5''$

Adjust the quadrilateral by the approximate method discussed in Article 10-30 of the text.*

*It is advisable to use 7-place logs for the logarithmic correction if you have them. However it will be acceptable to use the 6-place logs in the text but extreme care in interpolation will be necessary. Adjust the angles only to the nearest tenth of a second.

Assignment 3

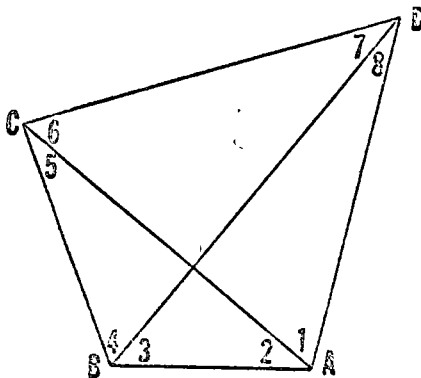


Figure 9

2. In the quadrilateral of problem 1 above, the plane coordinates of A are $X_A = 1,524,472.25$ feet and $Y_A = 624,502.34$ feet, and the plane coordinates of B are $X_B = 1,510,235.70$ feet and $Y_B = 627,355.52$ feet. Compute the length and azimuth of AB. Then solve the triangle DAB. Finally, compute the plane coordinates of D by a double-position computation.
3. Trilateration station A is at elevation 1360 feet above mean sea level and station B is at elevation 4980 feet. The distance from A to B, as measured by a geodimeter, is 28,545.60 meters. The line lies in latitude 45° approximately. Reduce this measured slope distance to the mean sea-level distance.

APPENDIX B
SAMPLE LETTERS REQUESTING PERMISSION TO QUOTE

Mr. Robert A. Kavesh, Secretary-Treasurer
The Journal of Finance
Graduate School of Business
New York University
100 Trinity Place
New York, New York 10006

Dear Mr. Kavesh:

University Extension of The University of Wisconsin is preparing a correspondence course entitled "Corporation Finance."

We would like to quote the following articles in their entirety from your journal in the course study guide.

1. "Leverage and the Cost of Capital"
by Ezra Solomon (May, 1963), pages 273-279.
2. "The S.E.C. Special Study and the Exchange Markets"
by David K. Eiteman (May, 1966), pages 311-323.

We would also like to quote the following:

"The Size and Maturity of Direct Placement Loans"
by Robert M. Soldeisky (March, 1960), lines 7 to
29 on page 32.

May we have your permission to reproduce the above materials in the study guide? About 150 copies will be printed for distribution to students.

We hope that our status as a state-supported, nonprofit educational institution will permit you to grant this request without charge. Your journal derives benefits, however, from exposure to students in this course who will be tomorrow's leaders and future subscribers.

If you have a particular form for use in acknowledging permission, we shall, of course, be happy to use it.

Sincerely,

The Secretary
National Association of Real Estate Boards
155 East Superior Street
Chicago, Illinois

Dear Sir:

Some years ago your Association granted permission to us to reproduce your code of ethics in our correspondence course in business ethics.

The code is presented to the student as a practical example of one of the realities in business ethics. Many students have undoubtedly benefited from exposure to your code.

Because we believe the code fulfills a highly useful purpose to students we'd like to have your permission to reproduce it in our revised course. I'd appreciate receiving a letter from you giving this permission.

If your code has been revised, I'd be pleased to have a revision.

Sincerely,

APPENDIX C

NATIONAL UNIVERSITY EXTENSION ASSOCIATION MEMBERS

THE NATIONAL UNIVERSITY EXTENSION ASSOCIATION
MEMBERSHIP 1968-69

University of Alabama	University of Kentucky
Auburn University	Louisiana State University
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University of Colorado	Northern Michigan University
Home Study Institute	Western Michigan University
University of Florida	Michigan State University
University of Georgia	University of Minnesota
University of Idaho	University of Mississippi
University of Illinois	University of Southern Mississippi
Loyola University	Mississippi State University
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Ball State University	University of Nebraska
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Mount Allison University	



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Luisiana 59,
Col. Nápoles
523-66-88

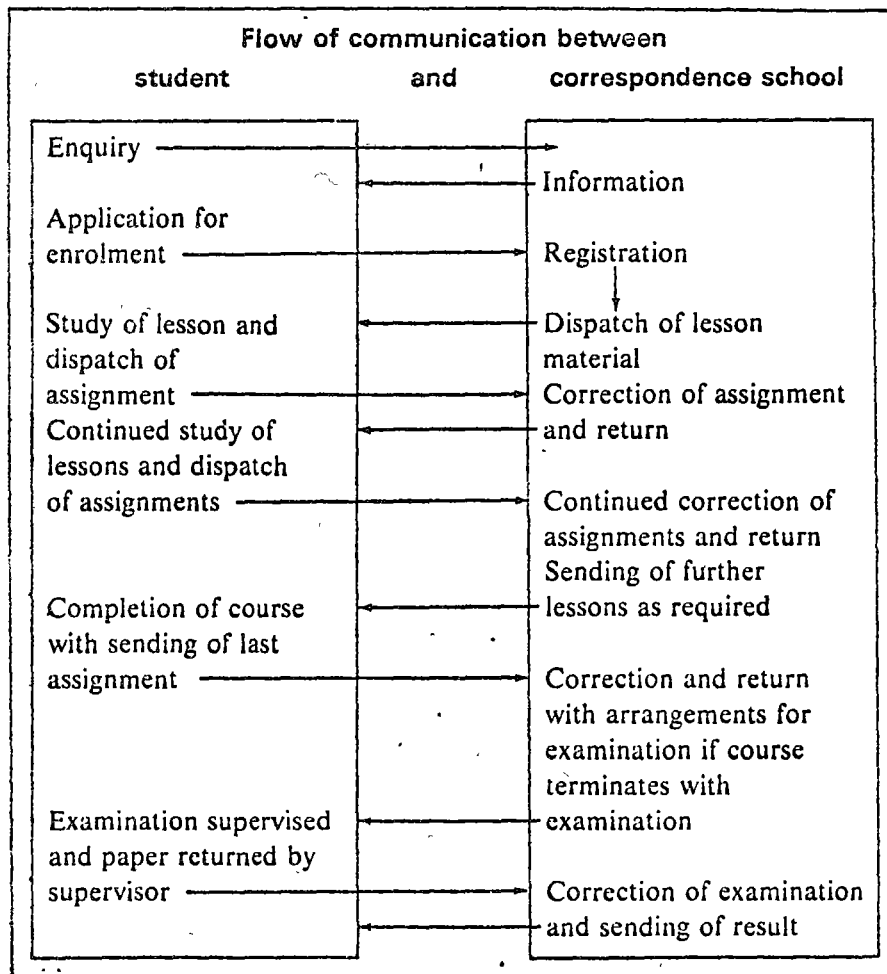
BODEGAS RURALES CONASUPO
REP. de Argentina 12
542-65-00 ext. 172

SRIA. OBRAS PUBLICAS
Miguel Laurent 840-5o. piso
Col. Narvarte
575-69-22



a greater volume to handle when the next day's mail arrives, and possibly still more letters unanswered at the end of the second day. So from day to day the accumulation grows until mail is unanswered for so long that anxious applicants write a second time to follow up their first unanswered enquiries. This only adds to the delay by creating more work, since the follow-up letters have to be opened, read and attached to the previous correspondence to find out what action has been taken. Thus delay in reply to letters not only frustrates students, but adds to the work of the correspondence school.

A golden rule for every correspondence school is that in





THE UNIVERSITY OF WISCONSIN
UNIVERSITY EXTENSION
Correspondence Instruction

Registration No _____

Course No _____

Course Name _____

No. of This Assignment _____

Date _____

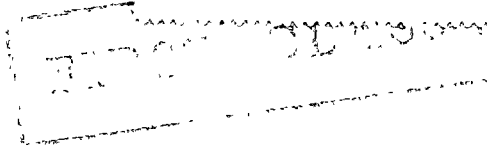
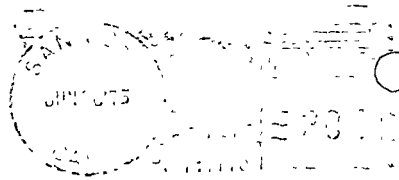


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Name		
Street or R. F. D.		
City	Zone	State

Begin your written assignment on this sheet. Use
paper of this size for additional pages.

UNIVERSITY OF WISCONSIN
MADISON



UNIVERSITY OF WISCONSIN
MADISON, WISCONSIN
53706

JUN 23 1975

UNIVERSITY OF WISCONSIN - EXTENSION
432 NORTH LAKE STREET
MADISON, WISCONSIN 53706

FROM: Dr. J. G. ...
PLEASE PRINT YOUR NAME AND ADDRESS
Street Address: R-244
City: MADISON, WISCONSIN
State: WI Zip Code: 53706

GRADE: A
DATE REC'D: JUN 23 1975
DATE RETURNED: _____



UNIVERSITY OF WISCONSIN-EXTENSION
Independent Study
432 NORTH LAKE STREET
MADISON, WISCONSIN 53706

Registration No. 61132
Course Name and No. 101.0 101
Assignment No. 449

UNIVERSITY OF WISCONSIN-EXTENSION
Independent Study
227 Extension Building

EXTENSION REQUEST

Student's Name: _____

Course: _____

Registration Date: _____ Assignments to be Completed: _____

If you wish to examine the student's file, it is available in 227 Extension Building. Please return letter, indicating your decision.

EXTENSION REQUEST APPROVED _____ REFUSED _____ INSTRUCTOR'S INITIALS _____ DATE _____

Suggestion regarding time allowance:

3 mo. _____, 6 mo. _____, 9 mo. _____, 1 year _____

Thank you,

Donald F. Kaiser
D.F. Kaiser
Director

UNIVERSITY OF WISCONSIN-EXTENSION
Independent Study
227 Extension Building

REINSTATEMENT REQUEST

Student's Name: _____

Course: _____

Registration Date: _____ Assignments to be Completed: _____

Please return letter indicating your decision.

REINSTATEMENT REQUEST APPROVED _____ REFUSED _____ INSTRUCTORS INITIALS _____

If approved, suggested time allowance to be figured upon receipt of the \$5.00 reinstatement fee:

3 mo. _____, 6 mo. _____, 9 mo. _____, 1 year _____

Thank You,
D.F. Kaiser
D.F. Kaiser
Director

REQUEST FOR FINAL EXAMINATION

Please return this form to University Extension as soon as you have submitted the last assignment.

Name of Student _____ Date _____

Street Address or P. O. Box Number _____

City _____ State _____ ZIP Code _____

Course in which examination is desired _____

Purpose for which course was taken _____
(University credit, teacher certificate credit, high school credit, no credit)

Have you submitted all of the assignments? Yes No

Suggested names of supervisor of final examination (see item 2, first page of directions) (Be certain to make arrangements with the supervisor before submitting this form.)

Name _____

Street Address or P. O. Box Number _____

City _____ State _____ ZIP Code _____

Title or Rank _____

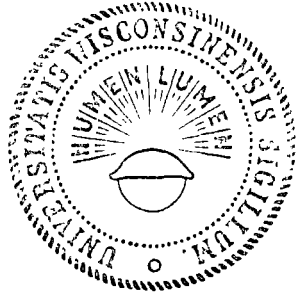
Name _____

Street Address or P. O. Box Number _____

City _____ State _____ ZIP Code _____

Title or Rank _____

NOTE. This form is to be detached and mailed directly to Independent Study, The University of Wisconsin, University Extension, 432 North Lake Street, Madison, Wisconsin 53706, so that it may receive prompt attention. It is *not* to be included with an assignment.



UNIVERSITY OF WISCONSIN—EXTENSION

INDEPENDENT STUDY

This is to certify that

has satisfactorily completed

Henry L. Ahlgran

Chancellor, University Extension

Date



December 17, 1974

Professor Norman R. Braton
247 Mechanical Engineering Building
University of Wisconsin-Madison
Madison, Wisconsin 53706

Dear Norm,

We are interested in developing a correspondence course in welding, one that would be as practical as possible and as complete as possible and one that would be suitable for persons with a high school education. In previous meetings with our Mr. Gritzmacher and Mr. Wortley you have expressed an interest and availability to do this course. This letter will serve as a contract for this work.

The work to be performed by you includes preparing a Study Guide (typed one side, double spaced, "artist-ready" sketches), Solutions to Written Assignments, Exams, Alternate Exams, and Exam Keys.

Specifically the course, which will be three credits, will be developed around the second edition of Welding Technology, by Giachino, Weeks, and Johnson.

Work to be performed by our Department will include promptly reviewing your manuscript, providing editorial services, obtaining credit if applicable, handling all reproductions for course distribution, and arranging for suitable announcements and publicity. Professor Donald Gritzmacher of our Department will be your liaison and will provide advice and assistance to you as necessary.

Additionally, we will provide space in our offices for you during the period that you will be doing the writing. Also, if you would like, we can provide typing assistance.

As we will be working on a publicity effort at the same time you are developing the course, time of completion will be important. We understand that you will be available to do this work beginning about the first of June. We would like to have all required materials delivered to us not later than August 15, 1975.

We have discussed two methods of compensating you for this work. One would be by a contract sum and the other would be by appointment for a period of time this summer. You have advised that you would do some preliminary work in order to estimate the total work required. We will subsequently

Norman R. Braton
Page 2
December 17, 1974

negotiate with you the amount of work and the basis for compensation. This will be done as an attachment to this letter.

You agree that the copyright and all other rights pertaining to the work, including any royalties or fees that may accrue, shall belong to the Regents of the University of Wisconsin System.

If the above meets with your approval, kindly indicate your acceptance below and return one copy to us. We would like to have your estimate of the work required just as soon as possible. We look forward to working with you on this project.

Very truly yours,



John P. Klus, Chairman
Department of Engineering,
Mathematics and Applied
Sciences

ACCEPTED:

By: Norman R. Braton

Date: December 27, 1974

COURSE CREDIT STATUS:

Graduate—The student has undertaken the graduate level requirements of this course. If the student has been admitted to a U.W. Graduate School and the course is an appropriate part of his curriculum, these credits will normally be applicable toward a degree from the University of Wisconsin.

Undergraduate—The student has undertaken the undergraduate requirements of this course. If the student has been admitted to the University of Wisconsin and the course is appropriate to his curriculum, these credits will normally be applicable toward a degree from the University of Wisconsin.

High School—if the student has obtained his principal's approval, these credits will normally be applicable toward a high school diploma.

Continuing Education—Academic work applicable, when part of the requirements, toward a certificate, diploma, or other form of recognition granted by University of Wisconsin—Extension.

Audit—The student has taken this course for review. No degree credits have been earned.

COURSE VALUE:

Semester Credit—Measures value of college-level (Bachelor or Master) courses.

Continuing Education Unit (CEU)—Measures value of continuing education courses and degree credit courses used as part of a continuing education program.

UW-Extension's CEU effort is part of a national effort to recognize self-enrichment and self-development through a program of continuing education. Programs having a CEU value can be characterized as organized educational experiences supported by well-defined learning objectives, capable direction, and qualified instruction.

One CEU is equivalent to ten hours spent in class instruction, or ten hours on work assignments outside of class, or a combination of the two.

Those participants who have received continuing education hours (CEH's) in previous programs can compute CEU's earned by simply dividing total CEH's by ten.

High School Credit—Measures value of high school level courses in Carnegie units.

.50 = 1/2 year or 1/2 Carnegie unit .75 = 3/4 year or 3/4 Carnegie unit

1 = 1 year or 1 Carnegie unit

GRADE OPTIONS:

Student Accomplishment Measured by Examination	
A Excellent	S Satisfactory (Pass)
B Good	U Unsatisfactory (Fail)
C Average	I Incomplete
D Poor	P Progress
F Fail	
Student Accomplishment Unexamined	
X	Attendance requirement only

UNIVERSITY OF WISCONSIN-EXTENSION
Application for Enrollment in Independent Study

PRINT INFORMATION INCOMPLETE APPLICATION WILL BE RETURNED

Do not write here

Reg. No. _____
 Date _____
 Course Fee _____
 Texts and Materials _____

 Service Charge 1.00
 Partial Payment Fee _____
 Registration Fee _____
 A.M. Lessons _____
 A.M. Materials _____
 Total _____

 Amount Received _____
 Bal. Due _____
 (Student) (Univ. Ext.)
 Instr. Approval & Date _____

Mr. _____
 Mrs. _____
 Miss _____

last name first name middle initial maiden name

Mail Address: street _____ city _____ state _____ zip code _____ county _____

Permanent Address: street _____ city _____ state _____ zip code _____ county _____

- () Check if you wish to purchase texts from Independent Study. Cost of texts not included in course fee. Consult Bulletin for prices.
- () Check if you want original materials sent AIR MAIL. Student will be billed separately for this service.
- () Check if you want your corrected assignments returned AIR MAIL. Consult Bulletin for charges and include with remittance.

COURSE: _____

department (e.g. English) course number course title number of credits

PREREQUISITES: What courses (high school, vocational school, or college) have you completed that are direct preparation for the course for which you are now applying? (Students applying for courses in mathematics or engineering must list ALL previous training in mathematics and science.)

name of course	grade rec'd	sem. in high school	sem. in college	other

(Circle last year of school completed)

HIGH SCHOOL	7	8	9	10	11	12	_____
COLLEGE	1	2	3	4	5	6	_____
VOCATIONAL SCHOOL	Yes _____		No _____		_____		

Social Security No. _____
 Year of Birth _____
 Occupation _____

Circle the statement which most accurately describes your reason for engaging in Independent Study at this time.

(0) Professional or vocational advancement (Noncredit)	(6) Deferred Univ. of Wisconsin Credit (Credit to be granted after student has been accepted for admission to residence work by the Office of Admissions.)
(1) Teacher's Certificate	(7) Credit at another college _____
(2) Univ. of Wisconsin--Extension Certificate	_____ (name and location)
(3) High School credit	(8) Other (Please specify) _____
(4) College entrance requirement	
(5) Univ. of Wisconsin credit (only for students who have been admitted to the Univ. of Wisconsin)	

If you are meeting a credit deadline, please give deadline date _____

Have you previously enrolled in a University of Wisconsin correspondence course? () Yes () No

HIGH SCHOOL STUDENTS Please ignore the remainder of this side and complete the reverse side of this form. Other enrollees complete this side only.

Are you in good standing at the College or University you last attended? () Yes () No

Have you attended any of the University of Wisconsin System campuses? () Yes () No

Have you previously enrolled in a University of Wisconsin--Extension Class? () Yes () No

SCHOOL ATTENDED (high school, vocational school, college)

name	location	from	to	diploma or degree
		19	19	
		19	19	
		19	19	

In signing this application I agree to abide by the rules and regulations of Independent Study as set down in the current bulletin.

_____ date _____ signature _____

FOR HIGH SCHOOL ENROLLEES ONLY

Name and address of High School in which credit is to be earned.

To the High School Principal

- 1. Is the student's correspondence work to be supervised by the principal or by a member of the school faculty? Yes No
- 2. Will this course be a part of the 16 units required for graduation? Yes No
- 3. Do you wish to have textbooks supplied by UW-Extension? Yes No
- 4. To whom should material be sent? _____
- 5. If the student is meeting a credit deadline, please give deadline date.

- 6. The following information would be helpful in obtaining departmental approval. Please give all data available.
IQ _____ Percentile _____ Class rank _____ Grade Average _____
- 7. Special remarks:

Approved for billing by Board of Education

Approved for credit _____

School _____

High School Principal

Signature _____
Prin., Supt., or Dir.

Date _____

Mail to

UNIVERSITY OF WISCONSIN-EXTENSION
227 Extension Building
432 North Lake Street
Madison, Wisconsin 53706

THE UNIVERSITY OF WISCONSIN
UNIVERSITY EXTENSION DIVISION
CORRESPONDENCE INSTRUCTION PROGRAM

DIRECTIONS FOR FINAL EXAMINATIONS

1. A final examination in a course is required whenever a student wishes the University Extension Division to issue a certificate of completion or an official transcript. This applies to university courses, vocational-technical courses, and high school courses. Students who are not sure whether they will request the University Extension Division to issue a statement regarding their work at some future date are urged to take the final examination.
2. The examination may be taken under the following regulations:
 - (a) A student may take the examination at the central office of the University Extension Division at Madison, at Milwaukee, or at an Extension Center.
 - (b) A student working for *high school credit* may take the examination under the supervision of the principal of the high school where he hopes to apply the credit, or of some person specially designated for that purpose by the principal. The principal's designation must be in writing.
 - (c) A student working for *teacher certificate credit* may take the examination under the supervision of the city or county superintendent, or of some person specially designated by the city or county superintendent for that purpose. The superintendent's designation must be in writing.
 - (d) A student working for *state college credit*, or credit at any college or university other than The University of Wisconsin, should take the examination under the supervision of the registrar of the institution where he hopes to apply the credit. If it is not possible for him to do so, he may take the examination under the conditions set forth for students working for University of Wisconsin credit. SEE 2(e).
 - (e) A student working for *University of Wisconsin credit* may take the examination under the supervision of a city superintendent, a county superintendent, a senior high school principal, a vocational school director, or the registrar of a recognized college or university.
 - (f) A student in vocational-technical courses who desires a University Extension certificate, and who cannot take the examination at one of the offices listed in 2(a) above, may take it under the supervision of some responsible person who will agree to conduct it according to the regulations of the University Extension Division. He should submit a list of two or more names—preferably as suggested in (b), (c), or (e). The Extension Division reserves the right to reject the name of any person suggested and to require another selection, or to make its own selection.
 - (g) A student in the armed forces of the United States may take the final examination under his superior commissioned officer, his Information and Education Officer, or his personnel officer.

DIRECTIONS FOR FINAL EXAMINATIONS

3. The University makes no provision for payment for the services of an examiner.
4. The final examination should be requested after the return of the last corrected assignment, and before the expiration date of the course. It should be taken within 30 days thereafter.
5. The student will be notified when the examination has been sent to his proctor or is ready at the Correspondence Instruction office. He should not appear to write his examination until he has received this notification. The examination questions, and also the paper upon which the examination is written, will be supplied by the Extension Division through the supervisor of the examination.

A student who is taking a course for college, university, or teacher certificate credit, may request the Extension Division to issue a transcript at any time after the course is completed. Transcripts for high school credits are automatically sent to the principal of the high school where the credit is to be applied, and students seeking such credit need not request a transcript.

A certificate of completion will be issued, upon request, for courses not involving credit. Certificates of completion are NOT issued for courses taken for high school or college credit.

Students who wish to have a transcript sent, or a certificate of completion issued at the successful completion of the final examination, should fill in page 4.

REQUEST FOR FINAL EXAMINATION

Please return to the University Extension Division as soon as the last assignment has been submitted.

Name of Student _____ Date _____

Street and Number _____

City _____ State _____

Course in which examination is desired _____

Purpose for which course was taken _____
(University credit, teacher certificate credit, high school credit, no credit)

Have you submitted all of the assignments? Yes No

Suggested names of supervisor of final examination:

Name _____

Street and Number _____

City _____ State _____

Title or Rank _____

Name _____

Street and Number _____

City _____ State _____

Title or Rank _____

NOTE: This form is to be detached and mailed directly to The University of Wisconsin, Extension Division, Correspondence Instruction Program, 432 North Lake Street, Madison 6, Wisconsin, so that it may receive prompt attention. It is not to be included with an assignment.

(To be detached and mailed to The University of Wisconsin,
Extension Division, Correspondence Instruction Program,
432 North Lake Street, Madison 6, Wisconsin

REQUEST FOR TRANSCRIPT OF CREDITS¹

College credits earned will be transferred either to the Office of Registration and Records of The University of Wisconsin or to other educational institutions, upon completion of the following form. Transcripts of high school credits are automatically sent to the principal of the high school where the credit is to be applied. Students earning such credit *need not* fill in this form.

Name _____ Date _____

Address _____

Correspondence Course _____

Dates of enrollment and completion of course _____

Transcript to be sent to _____

Address _____

\$1 00 will be charged for all additional transcripts.

¹In order to have credits earned during a summer or vacation period transferred to the Office of Registration and Records of The University of Wisconsin in time for registration, the student must complete his work, including the examination, at least two weeks preceding the opening of a semester. In making out semester programs, students whose credits have not been transferred may ask their advisors to telephone the Recorder of the Extension Division to verify course completions.

REQUEST FOR CERTIFICATE OF COMPLETION

Certificates of completion are issued upon request for successfully completed courses *not* carrying high school or university credit. Persons desiring such a certificate should complete and return the following form:

Name _____ Date _____

Address _____

Correspondence Course _____

Dates of enrollment and completion of course _____

Certificate to be sent to _____

Address _____

\$1.00 will be charged for all additional certificates.



REG. NO. 82379
 DEPT. 350
 DATE 11-3-72

COURSE 102

DOE, JOHN A.
 123 SOUTH FIRST STREET
 MADISON, WI 53705

	To C	MSS. Ret'd						
	1		11		21		31	
	2		12		22		32	COMMENTS
	3		13		23		33	
	4		14		24		34	
	5		15		25		35	
	6		16		26		36	
	7		17		27		37	
	8		18		28		38	
	9		19		29		39	
	10		20		30		40	
								Av.
								Course Grade

3 CR
 Purpose UNIV WI CR
 Year of Birth 1951
 Occupation STUDENT
 Prep. School
 College

FORM UW (22)-273

ADJUST VISIBLE CROSS REFERENCE #104250

DOE JOHN A
 123 SOUTH FIRST ST
 MADISON, WI 53702

SOC SEC NO 123-45-6789

UNIV WIS CREDIT

CURRENT ADDRESS

PERMANENT ADDRESS

LESS SENT	MSS REC D	GRADE	MSS RET D	14	28			
				15	29			10-15-72 Permit on file.
1				16	30			11-3-72 Lessons 6 and 9 are optional.
2				17	31			
3				18	32			
4				19	33			
5				20	34			
6				21	35			
7				22	36			
8				23	37			
9								

GRADES

LESS AV.	EXAM.	COURSE GRADE
----------	-------	--------------

111



Registration No. 81019

Date 12-4-74

Course Engr. 114

Course Fee _____

Books and Materials _____

Study Guide _____

Reinstatement Fee \$5.00

Wis Sales Tax _____

Total Charges 5.00

Amount Paid 5.00

Balance Due _____

(Please pay within 10 days)

Refund Due Student _____

FROM UNIVERSITY EXTENSION

THE UNIVERSITY OF WISCONSIN

Independent Study

432 North Lake Street

MADISON, WISCONSIN 53706

TO

Donald E. Hosek
3916 S. Elmwood Ave
Stickney, IL 60402

Form UW (22)-183

BUSINESS OFFICE

CR

Registration No. 69996

Date 12-3-74

Course Psych. 530

Course Fee _____

Books and Materials _____

Study Guide _____

Reinstatement Fee \$5.00

Wis Sales Tax _____

11



REG NO
DEPT
DATE

COURSE

1	11	21	31	COMMENTS	
2	12	22	32		
3	13	23	33		
4	14	24	34		
5	15	25	35		
6	16	26	36		
7	17	27	37		
8	18	28	38		
9	19	29	39		
10	20	30	40		
				Purpose	
				Year of Birth	
				Occupation	
				Prep School	
				College	
			Final	Av.	Course Grade

UW (22)-250

UNIVERSITY OF WISCONSIN-EXTENSION

APPROVAL BLANK FOR AD HOC APPOINTMENTS TO STAFF

NAME _____
(Last) (First) (Middle) (Maiden)

Office mailing address _____
(room) (building)

Rank _____

Principal duties _____

Duties are on _____ Credit _____ Noncredit level

SALARY

Salary of _____ for period _____

- To be paid:
 Hourly (time sheet to be submitted)
 Lump sum

Charge to: _____
Div. - Dept. Fund - Acct. Act.

Recommended: _____ Approved: _____
(Extension Dept. Head) (Date) (Dean or Director-Extension) (Date)

Please send three (3) copies to: EXTENSION PAYROLL OFFICE
105 Extension Building

UNIVERSITY OF WISCONSIN-EXTENSION
CORRESPONDENCE STUDY

REPORT OF FEE BASIS INSTRUCTION

_____ 197
(Year)

Month of _____ 197

To be sent in on or before the 14th of each month.

Instructor	Course	No. of lessons	Rate	Total Amount Due

NOTES:

1972

to be paid
() Monthly fee
() Term fee

UNIVERSITY OF WISCONSIN-EXTENSION

1972

UNIVERSITY OF WISCONSIN-EXTENSION

Payroll Certification for Fee Graders

Month _____ Year _____ Applied Sciences Department T-21-3628 Dept. No

Name	U.W. Credit Act 2	All Other Act 5	Total Amount
Bouffiou, Russell D.			
Essenmacher, Gery J.			
Hinkley, Jeffrey A.			
Hopkins, Edward			
Parson, James H.			
Panek, Robert J.			
Preichel, Paul M, Jr.			

Name	U.W. Credit Act 2	All Other Act 5	Total Amount
------	-------------------------	-----------------------	-----------------

Prepared by _____ Date _____

Chairman

LESSON REPORT FOR UW--EX COURSES FOR MONTH ENDING

<u>Course</u>	<u>Lessons</u>	<u>Course</u>	<u>Lessons</u>
ASTRONOMY -- 188		ENGINEERING MATHEMATICS -- 332	
100	Survey of Astronomy	A50	Shop Arithmetic I
CHEMISTRY -- 224		A52	Practical Arithmetic
H30	Functional Chem I	A53	Practical Algebra
H31	Functional Chem II	A54	Prac Trig & Logarithms
103	General Chemistry	A55	Practical Calculus
104	Gen Chem & Qual Anal	A58	Basic Math for Elec & Electronics I
711	Adv Inorganic Chem	A59	Basic Math for Elec & Electronics II
CIVIL ENGINEERING -- 240		ENGINEERING MECHANICS -- 346	
145	Elem Surveying I	101	Statics
146	Elem Surveying II	102	Dynamics
147	Top & Land Surveying	103	Mech of Materials
241	Route Location	GENERAL ENGINEERING -- 336	
252	Struc Analysis	112e	Logic Thought & Logic Cir
400	Photogrammetry	279	Technical Writing
422	Highway Engineering	A50	Basic Engineering Refresher
A70	Critical Path Method	GENERAL PHYSICAL SCIENCE -- 410	
590	Critical Path Network Techniques	H20	Gen Phys Science I
COMPUTER SCIENCES -- 688		H21	Gen Phys Science II
211	Fund of FORTRAN Progr	MECHANICAL ENGINEERING -- 612	
ELECTRICAL ENGINEERING -- 320		114	Prin of Indus Engineering
A54	Prac Indus Electron	A60	Automotive Engines
A61	Electric Wiring	A61	Automotive Chassis
A64	Essen of Electricity	A64	Diesel Engines
A65	Elem of Elec I	A80	Safety Supervision
A66	Elem of Elec II	A81	Safety Engineering
ENGRG DWG & ENGRG GRAPHICS -- 343		A84	Safety Management
100	Engineering Drawing	A90	Intro to Refrig
A88	Prin of Arch Drawing	A92	Steam Plant Operation
		428	Intro to Numer Control

LESSON REPORT FOR UW--EX COURSES -- 2

Course	Lessons
METALLURGICAL & MINERAL ENGRG -- 636	
104 Prin of Phys Met	_____
350 Intro to Materials Sci	_____
METEOROLOGY -- 640	
100 Weather and Climate	_____
PHYSICS -- 754	
H40 Elem Physics I	_____
H41 Elem Physics II	_____
103 General Physics	_____
104 General Physics	_____
201 Gen Phys for Engineers	_____

Course	Lessons
TECHNICAL AND VOCATIONAL -- 334	
V68 General Aeronautics	_____
W72 Fundamentals of Electricity	_____
W90 Intro to Refrigeration	_____

TOTALS

ASTRONOMY	_____
CHEMISTRY	_____
CIVIL ENGINEERING	_____
COMPUTER SCIENCES	_____
ELECTRICAL ENGINEERING	_____
ENGINEERING DRAWING & ENGINEERING GRAPHICS	_____
ENGINEERING MATHEMATICS	_____
ENGINEERING MECHANICS	_____
GENERAL ENGINEERING	_____
GENERAL PHYSICAL SCIENCE	_____
MECHANICAL ENGINEERING	_____
METALLURGICAL AND MINERAL ENGINEERING	_____
METEOROLOGY	_____
PHYSICS	_____
TECHNICAL AND VOCATIONAL	_____
GRAND TOTAL	_____

Faculty	_____
Fee Instructors	_____
Total	_____

UNIVERSITY OF WISCONSIN-EXTENSION

Month _____ Year _____

DEPARTMENT OF ENGINEERING

Name _____

Monthly Instructional Report

A. Independent Study: Courses Supervised _____ Registrations _____

Name of Course _____ Activity (Writing, Editing, Revising) _____

							TOTAL
Lessons by Self:							

B. Institutes:

Name of Institute _____ Activity (Planning meeting, mailing, teaching, etc.) _____

C. Short Courses:

Name of Course _____

D. Evening Classes:

Name _____ Activity _____

E. Contracts

% of Time _____ Name of Contract (or Number) _____ Activity _____

UNIVERSITY OF WISCONSIN-EXTENSION

Correspondence Records

GRADE REPORT

Name _____ Date _____

Course _____ Final Grade _____

Explanation of grade symbols:

A or Excellent, 93-100

B or Good, 85- 92

C or Fair, 77- 84

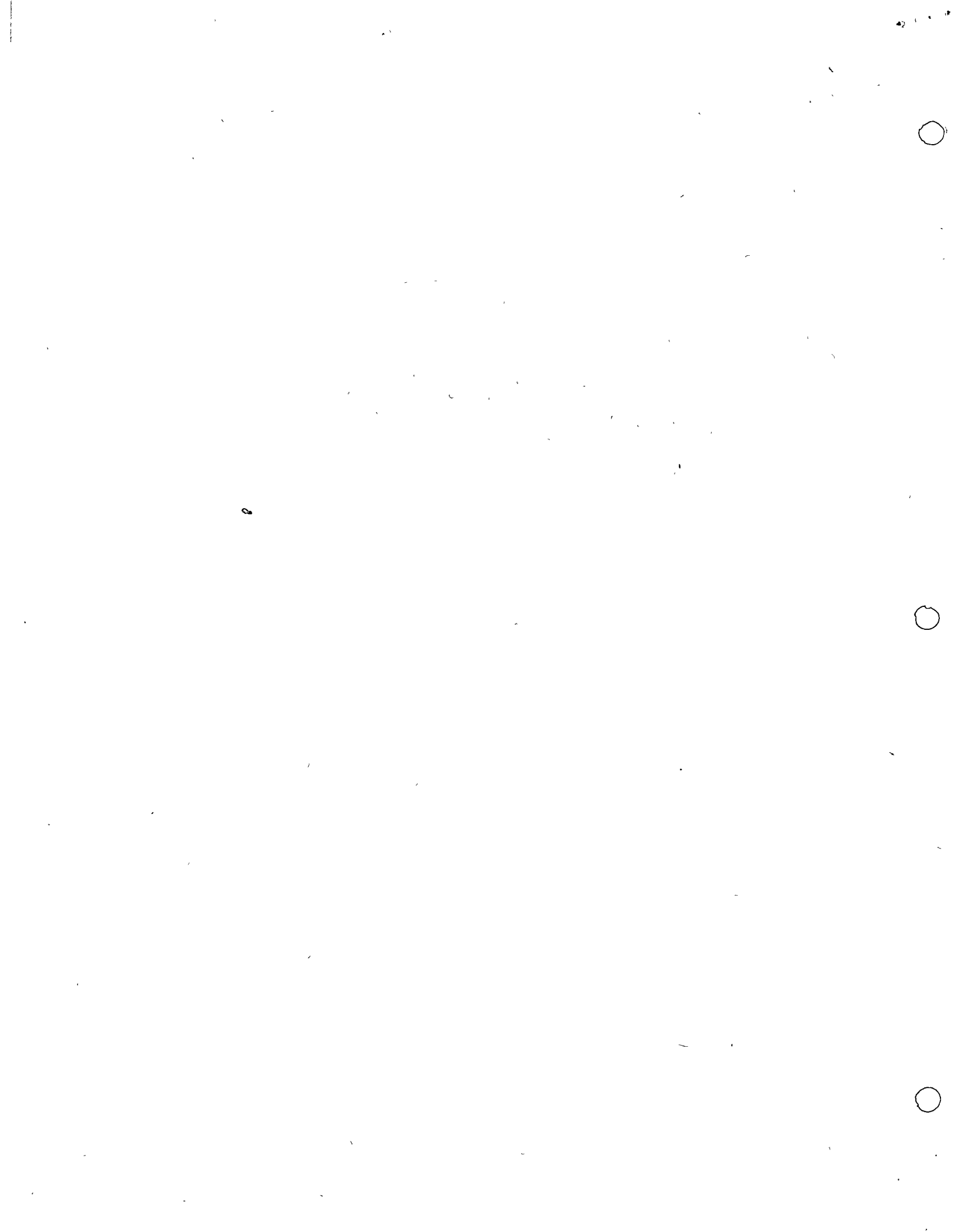
D or Poor, 70- 76

F or Failed, below 70

INSTRUCTOR

(over)

This card is an informal notification to the student and cannot be used as a certificate of credit. An official certification for those courses where credit has been secured will be made, upon request of the student, to the institution where credit is desired.



**CODE OF ETHICS FOR THE CEC
EUROPEAN COUNCIL FOR EDUCATION BY CORRESPONDENCE)**

As approved by the general meeting in Barcelona, June 1967.

1. The school's advertising must be truthful, informative and in accordance with the dignity of education.
2. The school shall not, in its publicity material or during personal consultations, hold out to prospective students promises of prizes or financial rewards of any kind, or of individual success, or any other improper inducements.
3. The school shall not employ representatives, however designated, on a commission basis.
4. The school shall fully inform students before they enrol for any course of:
 - a. the exact amount of the fee,
 - b. the exact terms of payment,
 - c. the services included in the fee,
 - d. the possibilities of terminating a course or transferring to another.
5. The school shall allow students to suspend the study of their courses for a reasonable length of time and subsequently to continue on the original terms.
6. The school shall allow students to terminate their courses before completion in the case of illness, unemployment, or for any other adequate reason.
7. The school shall exercise the utmost care not to endanger public goodwill by legal proceedings for the collection of fees.
8. If a school offers a guarantee of further tuition until success is gained at an examination, the guarantee conditions must:
 - a. be clearly stated in their promotional literature;
 - b. be fully and honestly implemented.
9. The school shall inform its students, before they enrol, of:
 - a. the scope and extent of the course;
 - b. any requirements of previous knowledge;
 - c. the prospects of undergoing official or other examinations, obtaining certificates, diplomas, etc.;
 - d. the name and qualifications of course writers where practicable;
 - e. the name and qualifications of tutors where practicable.

10. The school shall offer a sound consultation service to students who are doubtful about their previous knowledge or chances of completing a contemplated course successfully.
11. The courses shall be written, and the students' exercises shall be corrected by suitably qualified people.
12. The school's instruction material shall be educationally suitable, reasonably up to date, and presented in a practical manner.
13. The school's course units ('lessons, letters') shall each include a number of exercises, examination questions, problems or other tests based on the exposition of the course.
14. The school shall supervise its students' progress and shall encourage them to complete their studies.
15. The school shall issue only certificates or diplomas that fairly represent the instruction given, and shall not make any statement or imply that any such certificates or diplomas are equivalent to a degree or to a certificate awarded by a recognised examining body unless any such statement is based on indisputable documented facts.

WHERE TO GET HELP IN MARKETING RESEARCH

Whether you are gathering factual data or simply seeking ideas for new programs, there are many sources you can use. Listed below are some of the organizations, publications, and media you can use as a research basis.

- U.S. Department of Commerce — Census Reports

- Census of Population
 - Census of Retail Establishments
 - Census of Wholesale Establishments
 - Census of Industry

- County Business Patterns

- Number of industries
 - Kind of industries by SIC (Standard Industrial Classification) and number of employees
 - Size of payroll

- Bureau of Labor Statistics

- Employment
 - Average weekly earnings
 - Type of business

- County and City Data Book (issued every five years)

- Population, taxes, forms, business establishments

- Chamber of Commerce — local and state

- Names of members
 - Types of industries

- Manufacturers Associations

- Names of members

- State Economic or Commerce Departments

- Various reports on industrial development, new laws, and general profile data

- Sales Management Magazines Survey of Buying Power

- Population, income, spending power, retail sales, sales by major category—by county and major metropolitan area. This manual is issued annually and generally provides special segments on growth areas, race, and age of local population.

THE ROLE OF ADVERTISING AND PROMOTION IN MARKETING

As consumers we are all aware of the intensive use of advertising in the marketing of today's products. Practically all organizations engaged in the mass distribution of products use some form of advertising, and in the course of a single day we may be exposed to hundreds of messages.

With newspapers, TV, radio, magazines, direct mail, and billboards all competing for attention, it is necessary for the administrator to carefully plan the promotional approach best suited to his organization product and clientele.

Before designing a brochure, writing any copy, or choosing the media, the administrator should have a thorough understanding of the objectives and purposes of advertising.

The general objectives of advertising include the following:

- Produce direct and immediate action, such as registering for a course or sending for a brochure.
- Create awareness on the part of the reader or listener regarding your organization, its objectives or philosophy, and the educational product.
- Create or change the concept of your institution or program.

In addition to these general objectives, the reader should consider some of the specific purposes of advertising:

- Increase the use of the service by increasing the units of purchase (take two courses) or increase the length of the buying season (attend summer school).
- Attract a new age group to your service.
- Make known the organization and what it stands for.
- Dispel wrong impressions.
- Help render a public service or support a public cause.
- Reach a person who influences the user or purchaser.
- Increase the strength of the entire field of education.
- Acquaint the public with all the services provided by your organization.
- Secure acceptance for subordinate programs or services.
- Counteract the use of programs or courses that may be viewed as substitutes.

THE ADVERTISING AND PROMOTION BUDGET

In conversations with advertising and marketing managers, you will be exposed to numerous philosophies regarding the methods of budgeting for the promotional program. Some organizations simply take a flat percentage of their total departmental budget while others add a percentage to whatever they spent last year. Still others might attempt to copy what other institutions spend.

The ideal method of determining the budget size is to relate it to the promotional task or actual marketing objectives you wish to achieve. By following this method, all activities will be tied directly to actual costs and the administrator will be in a position to perform a cost analysis on all programs.

A second advantage to following the task method is that it forces the administrator to plan the marketing program in more detail and for a longer period of time. The benefits to this planning effort are that all programs are placed in proper perspective and by planning far in advance, the administrator avoids managing the department by crisis.

Obviously, this approach is more efficient since the administrator knows precisely what the objectives of the organization are, and then allocates only those dollars and human resources that are needed to meet those objectives.

In order to follow the method proposed above, you should do the following:

1. Determine the cost, step-by-step, of attaining a fully operational advertising performance, and on this basis make budget recommendations; you must know what you want your advertising program to do.
2. Consider the return you can expect on your advertising expenditures. In other words, you can develop a revenue/expenditure ratio that can be used as a measure of performance efficiency.
3. Consider how much pioneering effort you must do in your advertising. How well does the consumer know the institution and its programs? How well established is the organization in the minds of the potential user?
4. Consider the cost of the media you must use to reach your customers. Whether it be radio, newspaper, brochures, or direct mail, determine in advance what you will need in order to fulfill the objectives as originally stated.

WHAT AFFECTS THE READERSHIP OF AN ADVERTISEMENT

As an advertiser, you have no doubt been amazed at the "pulling power" of some ads while some of your real masterpieces never created a stir.

The readership of an advertisement is affected by many factors. The same ad in a different publication, or used at a different time, may not be as effective as its initial run. Outlined below are some of the factors that affect readership:

- type of product or service being offered
- amount of space in the ad
- amount of white space used in the ad
- use of color and the kinds of colors used
- copy used in the ad
- general layout of the ad
- illustrations used
- headline—words, length, and type face
- believability of the ad
- competitive ads in the same medium
- actual media or publication chosen
- understanding of the message
- reader's interest in the message
- location of the advertisement in the publication
- ease in which the reader can respond to the ad

There has been much study on the readership of advertisements. However, due to the large number of variables it is difficult to determine the exact reasons for high readership on any one ad.

THE ESSENTIAL ELEMENTS OF PROMOTIONAL PIECES AND ADVERTISEMENTS

What should promotional literature do for your organization? If you could write the ideal ad or develop the most effective brochure, what results or objectives would you hope to achieve?

All successful promotional literature attempts to do five things:

The first job of all promotional literature is to get the reader's attention. Since the average person is constantly bombarded with advertisements, the writer finds himself in a highly competitive situation whenever he publishes an ad or mails a brochure.

The most frequently used methods of getting attention are through the use of a "catchy" headline or an interesting illustration including art work and photography. Studies have shown that readership goes up with the use of color and the liberal use of white space.

The second major concern of effective promotional literature is to create interest in the subject. Having caught the reader's attention, the ad must now create enough interest in the reader's mind to encourage him to read the entire message.

The third objective is to arouse desire in the mind of the reader. As he reads the message, he should feel the service or product will fill some need or lead to some satisfaction.

The fourth objective of effective promotional literature is to create conviction in the mind of the reader that the advertisement will indeed perform the service or deliver the satisfaction promised in the message.

The final objective of the ad should be to spur action on the part of the reader. After reading the ad, the reader should be encouraged to take some explicit action which might be to enroll in a course, fill out a coupon, or call for additional information. In other words, this is the step that actually moves the reader to do what you want him to do.

In order to achieve these objectives, the promotional writer has six major elements with which to work. They are:

The headline — This is the idea or main thought of interest to the reader.

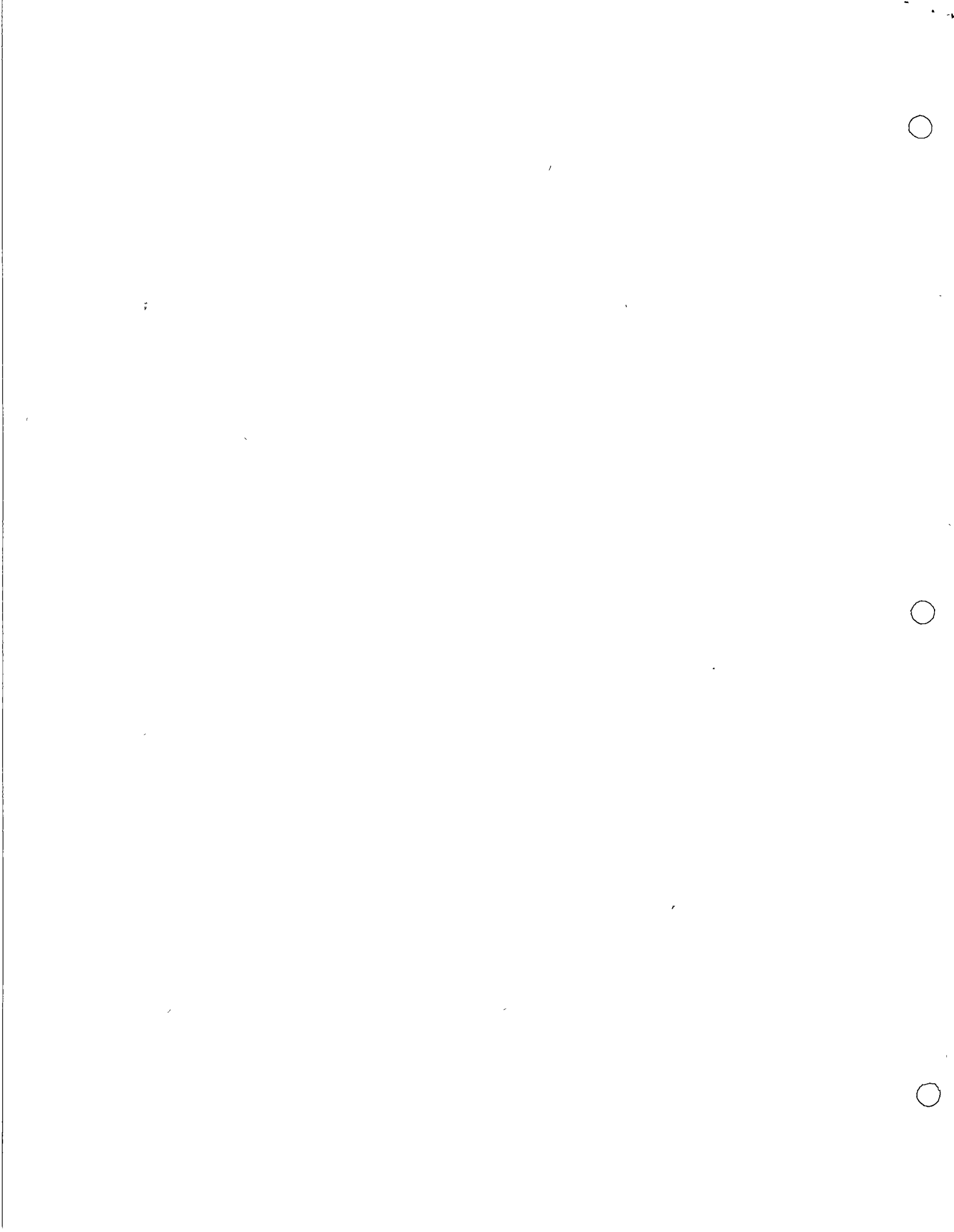
Amplification of headline — The verbal vehicle that carries the reader's interest from the main thought (the headline) to the program you're promoting.

Explanation of benefits offered or claims made — Through the use of the copy, the writer explains why the reader should be interested in the offering being made.

Proof of any claims — The evidence or support of any claim or benefit offered.

Additional advantages from the program — Having shown the main advantages of the program being offered, the writer now offers additional advantages in support of the program. This appears to be a bonus in the eyes of the reader.

The closing — This is probably the most important element of the six, because it is here the reader is offered a suggestion as to how he can obtain the suggested satisfaction by taking some specific action.



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"ENSEÑANZA POR CORRESPONDENCIA"

O B J E T I V O S

1a. y 2a. Sesión

1. Modificar la conducta de profesionistas adultos aplicando una teoría que permita aumentar el conocimiento y modificar la conducta.
2. Cómo afectan las experiencias previas positiva y negativamente a propósito de la educación.
3. Conocer diferentes teorías acerca de las variables que afectan el aprendizaje en general y el aprendizaje de los adultos en particular.
4. Diferenciar los elementos que intervienen en la educación para adultos y en la de no adultos.
5. Distinguir la necesidad de hacer que la gente aplique lo aprendido como un satisfactor de sus demandas reales.
6. Hacer entender que los cursos por correspondencia se dirigen a los adultos y conocer los problemas de diseño de los mismos.
7. La retroalimentación como medio de autoevaluación.
8. Conocer la forma de motivar y convencer a los adultos, trabajando en cambiar su forma de conducta por medio de los cursos por correspondencia.
9. Analizar las distintas actitudes entre quienes estudian cursos por correspondencia buscando grado académico y quienes no lo buscan.
10. Sensibilizarnos sobre las condiciones del aprendizaje.
11. Introducción a los cursos por correspondencia y establecer un aviso o llamado de atención, sobre el deseo de estudiar y estudiar efectivamente.
12. Señalar la importancia de la motivación. definir objetivos y métodos de enseñanza.
13. Deshacer la actitud del adulto ante estos cursos: Resistencia. Encontrar la manera de motivar.
14. Establecer metodología sobre la función del aprendizaje en los cursos por correspondencia.
15. Conocer los problemas del aprendizaje en los adultos y como solucionarlos.

16. Provocar la discusión sobre los conceptos presentados y otros no tratados con relación a los mismos.
17. Importancia de la motivación cuando lo que se enseña se puede poner en práctica.
18. Analizar las mecánicas utilizadas en cursos por correspondencia para adultos y jóvenes y obtener los mejores resultados.
19. Establecer que actualmente no puede ser satisfecha la necesidad de aprender normalmente y que los cursos por correspondencia pueden ser la solución.
20. Objetivos para la primera parte del curso:
 - 20.1 Establecer la diferencia entre la forma de aprendizaje del adulto y la del niño.
 - 20.2 Determinar los posibles cambios conductuales en el adulto según sus diferentes campos de actividad.
 - 20.3 Establecer los cambios conductuales deseables en el adulto.
 - 20.4 Plantear las conquistas hacia las cuales tienden los programas en este campo.
 - 20.5 Describir las condiciones básicas para el aprendizaje.
21. Objetivos finales:
 - 21.1 Visión panorámica del curso.
 - 21.2 Esbozo de una teoría de la enseñanza para adultos.
 - 21.3 Problemática de la enseñanza para adultos.
 - 21.4 La enseñanza del adulto como una necesidad
 - 21.5 Vías de acción para satisfacer esa necesidad.
 - 21.6 Requerimientos específicos para los maestros por correspondencia.
 - 21.7 Requerimientos para los adiestrados por correspondencia.
 - 21.8 Tesis de Miller
 - 21.9 Tesis de Getsel
 - 21.10 Integración en grupos de los asistentes.