英语考试高级阅读文选

包凡一 何庆权 俞敏洪 编著

目　　录

第一部分　　动物、植物、生物学

Classification of Plants

The newer classification system lists all of the more than 300,000 known plants in just two phyla, the Bryophytes and the Tracheophytes. Bryophytes, the mosses and liverworts, are usually soft and nonwoody in structure, take in water through short root-like filaments called rhizoids, and may have stems and simple leaves but, unlike the more complex Tracheophytes, do not have true roots or vascular tissue whose function is to circulate water, food, and essential minerals throughout the organism.

Tracheophytes are divided into four sub-phyla: lycopsids, which number some 900 living species; sphenopsids, whose fossil species contributed to coal formation in the Carboniferous period, but which have few living species; psilopsids, an extinct group of relatively simple plants, which fossil studies show to have been more advanced than any of the mosses; and pterosids, subdivided into three classes, the ferns, the gymnosperms, and the angiosperms.

The angiosperms, the most highly developed and complex class of plants, reproduce by means of single and double seed leaves called cotyledons. Monocots, such as corn, wheat, lilies, and orchids, have leaves with parallel veins, while dicots, which include oaks, maples, roses and thistles, among others, have net-veined leaves and stems with annual growth rings.

Adaptations of Desert Plants

Desert plant populations have evolved sophisticated physiological and behavioral traits that aid survival in arid conditions. Some send out long, unusually deep taproots; others utilize shallow but widespread roots, which allow them to absorb large, intermittent flows of water. Certain plants protect their access to water. The creosote bush produces a potent root toxin which inhibits the growth of competing root systems. Daytime closure of stomata exemplifies a further genetic adaptation; guard cells work to minimize daytime water loss, later allowing the stomata to open when conditions are more favorable to gas exchange with the environment.

Certain adaptations reflect the principle that a large surface area facilitates water and gas exchange. Most plants have small leaves, modified leaves (spines), or no leaves at all. The main food-producing organ is not the leaf but the stem, which is often green and non-woody. Thick, waxy stems and cuticles, seen in succulents such as cacti and agaves, also help conserve water. Spines and thorns (modified branches) protect against predators and also minimize water loss.

Leaves

Microbiological activity clearly affects the mechanical strength of leaves. Although it cannot be denied that with most species the loss of mechanical strength is the result of both invertebrate feeding and microbiological breakdown, the example of *Fagus sylvatica* illustrates loss without any sign of invertebrate attack being evident. *Fagus* shows little sign of invertebrate attack even after being exposed for eight months in either lake or stream environment, but results of the rolling fragmentation experiment show that loss of mechanical strength, even in this apparently resistant species, is considerable.

Most species appear to exhibit a higher rate of degradation in the stream environment than in the lake. This is perhaps most clearly shown in the case of *Alnus*. Examination of the type of destruction suggests that the cause for the greater loss of material in the streamprocessed leaves is a combination of both biological and mechanical degradation. The leaves exhibit an angular fragmentation, which is characteristic of mechanical damage, rather than the rounded holes typical of the attack by large particle feeders or the skeletal vein pattern produced by microbial degradation and small particle feeders. As the leaves become less strong, the fluid forces acting on the stream nylon cages caused successively greater fragmentation.

Mechanical fragmentation, like biological breakdown, is to some extent influenced by leaf structure and form. In some leaves with a strong midrib, the lamina break up, but the pieces remain attached by means of the midrib. One type of leaf may break clean while another tears off and is easily destroyed once the tissues are weakened by microbial attack.

In most species, the mechanical breakdown will take the form of gradual attrition at the margins. If the energy of the environment is sufficiently high, brittle species may be broken across the midrib, something that rarely happens with more pliable leaves. The result of attrition is that, where the areas of the whole leaves follow a normal distribution, a bimodal distribution is produced, one peak composed mainly of the fragmented pieces, the other of the larger remains.

To test the theory that a thin leaf has only half the chance of a thick one for entering the fossil record, all other things being equal, Ferguson (1971) cut discs of fresh leaves from 11 species of different leaf thickness and rotated them with sand and water in a revolving drum. Each run lasted 100 hours and was repeated three times, but even after this treatment, all species showed little sign of wear. It therefore seems unlikely that leaf thickness alone, without substantial microbial preconditioning, contributes much to the probability that a leaf will enter a depositional environment in a recognizable form. The results of experiments with whole fresh leaves show that they are more resistant to fragmentation than leaves exposed to microbiological attack. Unless the leaf is exceptionally large or small, leaf size and thickness are not likely to be as critical in determining the preservation potential of a leaf type as the rate of microbiological degradation.

Plants and Geography

Although different plants have varying environmental requirements because of physiological differences, there are certain plant species that are found associated with relatively extensive geographical areas. The distribution of plants depends upon a number of factors among which are (1) length of daylight and darkness, (2) temperature means and extremes, (3) length of growing season, and (4) precipitation amounts, types, and distribution.

Daylight and darkness are the keys by which a plant regulates its cycle. It is not always obvious how the triggering factor works, but experiments have shown day length to be a key. A case in point is that many greenhouse plants bloom only in the spring without being influenced by outside conditions other than light. Normally, the plants keyed to daylight and darkness phenomena are restricted to particular latitudes.

In one way or another, every plant is affected by temperature. Some species are killed by frost; others require frost and cold conditions to fruit. Orange blossoms are killed by frost, but cherry blossoms will develop only if the buds have been adequately chilled for an appropriate time. Often the accumulation of degrees or the direction of temperatures above or below a specific figure critically affects plants. Plant distributions are often compared with isotherms to suggest the temperature limits and ranges for different species. The world's great vegetation zones are closely aligned with temperature belts.

Different plant species adjust to seasonal changes in different ways. Some make the adjustment by retarding growth and arresting vital functions during winter. This may result in the leaf fall of middle latitude deciduous trees. Other plants disappear entirely at the end of the growing season and only reappear through their seeds. These are the annuals, and they form a striking contrast to the perennials, which live from one season to another.

Precipitation supplies the necessary soil water for plants, which take it in at the roots. All plants have some limiting moisture stress level beyond which they must become inactive or die. Drought resistant plants have a variety of defenses against moisture deficiencies, but hydrophytes, which also are adapted to humid environments, have hardly any defense against a water shortage.

Whales

Although vocal cords are lacking in cetaceans, phonation is undoubtedly centered in the larynx.

The toothed whales or odontocetes (sperm whale and porpoises) are much more vociferous than the whalebone whales, or mysticetes. In this country observers have recorded only occasional sounds from two species of mysticetes (the humpback and right whale). A Russian cetologist

reports hearing sounds from at least five species of whalebone whales but gives no details of the circumstances or descriptions of the sounds themselves. Although comparison of the sound-producing apparatus in the two whale groups cannot yet be made, it is interesting to note that the auditory centers of the brain are much more highly developed in the odontocetes than in the mysticetes, in fact, to a degree unsurpassed by any other mammalian group.

Bioluminescence in the Sea

At night, schools of prey and predators are almost always spectacularly illuminated by the bioluminescence produced by the microscopic and larger plankton. The reason for the ubiquitous production of light by the microorganisms of the sea remains obscure, and suggested explanations are controversial. It has been suggested that light is a kind of inadvertent by-product of life in transparent organisms. It has also been hypothesized that the emission of light on disturbance is advantageous to the plankton in making the predators of the plankton conspicuous to their predators! Unquestionably, it does act this way. Indeed, some fisheries base the detection of their prey on the bioluminescence that the fish excite. It is difficult, however, to defend the thesis that this effect was the direct factor in the original development of bioluminescence, since the effect was of no advantage to the individual microorganism that first developed it. Perhaps the luminescence of a microorganism also discourages attack by light-avoiding predators and is of initial survival benefit to the individual. As it then becomes general in the population, the effect of revealing plankton predators to their predators would also become important.

Animal Torpidity

A few species demonstrate conditions which are neither complete hibernation nor aestivation. Instead of going into a long "sleep" during the most adverse season, they become torpid for a few hours each day. This kind of behavior is known in other animals – bats become torpid during daytime, and hummingbirds at night. The first time I appreciated this phenomenon was while working with fat mice (*Steatomys*) in Africa. These mice, incidentally, have a most appropriate name, for their bodies are so full of fat they resemble little furry balls. Fat storage as a method of survival has rebounded to some extent as far as the fat mice are concerned. They are regarded as a succulent delicacy by many African tribes who hunt them with great tenacity; when captured, the mice are skewered and fried in their own fat. A captive fat mouse was once kept without food or water for thirty-six days; at the end of that time it had lost a third of its weight but appeared quite healthy. During the dry season, some captives spent the day in such a deep state of torpor that they could be roughly handled without waking. The body temperature was a couple of degrees above room temperature and the respiration was most irregular, several short pants being followed by a pause of up to three minutes. Just before dusk the mice woke up of their own accord and respired normally. In this case the torpid state was not induced by shortage of food or abnormal temperatures. The forest dormouse of southern Asia and Europe also undergoes periods

of torpidity during the day; this species has been recorded as having pauses of up to seventeen minutes between breaths. There is also a record of a leaf-eared mouse of the Peruvian desert which became torpid under severe conditions.

Mammals

The history of mammals dates back at least to Triassic time. Development was retarded, however, until the sudden acceleration of evolutional change that occurred in the oldest Paleocene. This led in Eocene time to increase in average size, larger mental capacity, and special adaptations for different modes of life. In the Oligocene Epoch, there was further improvement, with appearance of some new lines and extinction of others.

Miocene and Pliocene time was marked by culmination of several groups and continued approach toward modern characters. The peak of the career of mammals in variety and average large size was attained in the Miocene.

The adaptation of mammals to almost all possible modes of life parallels that of the reptiles in Mesozoic time, and except for greater intelligence, the mammals do not seem to have done much better than corresponding reptilian forms. The bat is doubtless a better flying animal than the pterosaur, but the dolphin and whale are hardly more fishlike than the ichthyosaur. Many swift-running mammals of the plains, like the horse and the antelope, must excel any of the dinosaurs. The tyrannosaur was a more ponderous and powerful carnivore than any flesh-eating mammal, but the lion or tiger is probably a more efficient and dangerous beast of prey because of a superior brain. The significant point to observe is that different branches of the mammals gradually fitted themselves for all sorts of life, grazing on the plains and able to run swiftly (horse, deer, bison), living in rivers and swamps (hippopotamus, beaver), dwelling in trees (sloth, monkey), digging underground (mole, rodent), feeding on flesh in the forest (tiger) and on the plain (wolf), swimming in the sea (dolphin, whale, seal), and flying in the air (bat). Man is able by mechanical means to conquer the physical world and to adapt himself to almost any set of conditions.

This adaptation produces gradual changes of form and structure. It is biologically characteristic of the youthful, plastic stage of a group. Early in its career, an animal assemblage seems to possess capacity for change, which, as the unit becomes old and fixed, disappears. The generalized types of organisms retain longest the ability to make adjustments when required, and it is from them that new, fecund stocks take origin – certainly not from any specialized end products. So, in the mammals, we witness the birth, plastic spread in many directions, increasing specialization, and in some branches, the extinction, which we have learned from observation of the geologic record of life is a characteristic of the evolution of life.

Heredity of Horses

Horse owners who plan to breed one or more mares should have a working knowledge of heredity and know how to care for breeding animals and foals. The number of mares bred that actually conceive varies from about 40 to 85 percent, with the average running less than 50 percent. Some mares that do conceive fail to produce living foals. This means that, on the average, two mares are kept a whole year to produce one foal, and even then, some foals are disappointments from the standpoint of quality.

The gene is the unit that determines heredity. In the body cells of horses there are many chromosomes. In turn, the chromosomes carry pairs of minute particles, called genes, which are the basic hereditary material. The nucleus of each body cell of horse contains 32 pairs of chromosomes, or a total of 64; whereas there are thousands of pairs of genes.

When a sex cell (a sperm or an egg) is formed, only one chromosome and one gene of each pair goes into it. Then, when mating and fertilization occur, the 32 single chromosomes from the germ cell of each parent unite to form new pairs, and the chromosomes with their genes are again present in duplicate, in the body cells of the embryo. Thus, with all possible combinations of 32 pairs of chromosomes and the genes that they bear, it is not strange that full sisters (except identical twins from a single egg split after fertilization) are so different. Actually we can marvel that they bear as much resemblance to each other as they do.

Because of this situation, the mating of a mare with a fine track record to a stallion that transmits good performance characteristics will not always produce a foal of a merit equal to its parents. The foal could be markedly poorer than the parents or, in some cases, it could be better than either parent.

Simple and multiple gene inheritance occurs in horses, as in all animals. In simple gene inheritance, only one pair of genes is involved; thus, a pair of genes may be responsible for some one specific trait in horse. However, most characteristics, such as speed, are due to many genes; hence, they are called multiple-gene characteristics.

For most characteristics, many pairs of genes are involved. for example, growth rate in foals is affected by (1) appetite and feed consumption, (2) the proportion of the feed eaten that is absorbed, and (3) the use to which the nutrients are put – whether they are used for growth or fattening, and each in turn is probably affected by different genes. Because multiple characteristics show all manner of gradation from high to low performance, they are sometimes referred to as quantitative traits. Thus, quantitative inheritance refers to the degree to which a characteristic is inherited. For example, all racehorses can run and all inherit some ability to run, but it is the degree to which they inherit the ability that is important.

Marine Animal Evolution

Until the 1970's, the pattern of early marine animal evolution seemed to be well established. Most present-day animal phyla had appeared during the "Cambrian explosion", an extraordinary burgeoning of multicellular life in the warm seas of the Cambrian period, between 570 and 500 million years ago. It was assumed that, despite the very large number of species that appeared during the Cambrian explosion, nearly all fit into the same rather small number of phyla that exist today. Each phylum – a group of organisms with the same basic pattern of organization, such as the radial symmetry of jellyfish and other coelenterates or the segmented structure of worms and other annelids – was seen as evolutionarily stable. Innumerable individual species have arisen and died out but development and extinction were assumed to take place within existing phyla; the elimination of entire phyla was thought to be extremely rare. However, a diverse group of marine fossils, known collectively as the "Problematica", presented difficulties for this interpretation. The Problematica show patterns of organization so bizarre that it is hard to fit any of them into present-day phyla. They include the banana shaped *Tullimonstrum* and the spiked spiny *Hallucigenia*, creatures whose very names reflect the classifier's discomfort. The "Ediacaran fauna", which respired, absorbed nutrients, and eliminated wastes directly through their external surfaces, are also included among the Problematica. Theirs was an approach taken by only a few modern multicelled creatures (such as tapeworms) that are otherwise totally unlike them. Recently, several theorists have argued that the Problematica are not just hard to classify – they are evidence that the conventional view of the Cambrian explosion is wrong. They contend that the Cambrian explosion represented the simultaneous appearance of a much larger number of animal phyla than exists today. Each was a separate "experiment" in basic body design, and the Cambrian seas teemed with many different phyla, or basic body plans, each represented by only a few species. Today, the number of phyla has fallen drastically, but each surviving phylum contains a much larger number of species – there are at least 20,000 species of fish alone. The Problematica, then, were not unsuccessful variants within present-day phyla; each represented a distinct phylum in its own right.

Revisionists and conventional theorists agree that modern marine species are products of natural selection. But the revisionists contend that the selection process eliminated not only particular unfavorable traits, but entire body plans, entire approaches to survival. The Ediacaran fauna, for example, represented a particular structural solution to the basic problems of gas and fluid exchange with the environment. This approach to body engineering was discarded at the same time as the Ediacaran fauna themselves were wiped out; given the improbability of duplicating an entire body plan through chance mutation, it was unlikely that this particular approach would ever be tried again.

Saving the Porpoise

Just as the members of the Inter-American Tropical Tuna Commission have subscribed to annual quotas on the tuna harvest, they are agreed that cooperation is essential in limiting the porpoise kill. The common interest is preservation of the tuna industry. And since modern fishing methods exploit the cozy relationship between the yellowfin tuna and the porpoise, tuna fishing would

become less profitable if the number of porpoises decreased. Tuna and porpoise are often found together at sea, and the fishermen have learned to cast their nets where they see the porpoises, using them to locate the tuna. The problem is that many porpoises die in the nets.

The commission deliberations acknowledged the environmental pressures that have led to strict regulation of U.S. tuna crews under federal law. Delegates also recognized that porpoise protection goals are relatively meaningless unless conservation procedures are adopted and followed on an international basis. Commission supervision of survey, observer, and research programs won general agreement at the eight-nation conference.

The method and timetable for implementing the program, however, remain uncertain.

Thus the federal regulation that leaves U.S. crews at a disadvantage in the tuna-harvest competition remains a threat to the survival of the tuna fleet. Still, the commission meetings have focused on the workable solution. All vessels should be equipped with the best porpoise-saving gear devised; crews should be trained and motivated to save the porpoise; a system must be instituted to assure that rules are enforced. Above all, the response must be international. Porpoise conservation could well be another element in an envisioned treaty that remains unhappily elusive at the continuing Law-of-the-Sea Conference.

The tuna industry interest in saving porpoises is bothersome to many who also want to save the porpoise, but object to the industry motivation for doing so. For fishermen, saving the porpoise is valuable only because the porpoise leads them to tuna. For more compassionate souls, however, the porpoise is not just a tuna finder, but, more important, the sea creature that seems most human. Fredson Delacourte, national chairman of the "People for Animals" drive, says this: "It is especially sad that these sea creatures, in spite of their keen intelligence, cannot outwit the tuna fishermen who, anxious to meet their annual quota, ensnare and destroy porpoises as well. But it is even sadder that the tuna industry is so intent upon using the porpoise so greedily." Mr. Delacourte praises the fishing industry for its plans to save the porpoises, at the same time that he wishes their motives were more altruistic. He insists that any "law of the sea" should be essentially a moral law rather than an economic one.

Reefs

There are a great many points about coral reefs that remain subjects of scientific puzzlement. One mystery concerns the relationship between Scleractinia, the coral type whose colonization produces reefs, and their symbiotic partners the zooxanthellae, the unicellular algae present in the corals' endodermic tissues. It is known that each symbiont plays an integral part in the formation of a reef's protective limestone foundation. The coral polyps secrete calceous exoskeletons which cement themselves into an underlayer of rock, while the algae deposit still more calcium carbonate, which reacts with sea salt to create an even tougher limestone layer. It is also known that, due to the algal photosynthesis, the reef environment is highly oxygen-saturated,

while the similarly high amounts of carbon dioxide are carried off rapidly. All this accounts for the amazing renewability of coral reefs despite the endless erosion caused by wave activity. However, the precise manner in which one symbiont stimulates the secretion of calcium carbonate by the other remains unclear.

Scientists have also proposed various theories to explain the transformation of "fringing reefs", those connected above sea level to land masses, into "barrier reefs" that are separated from shorelines by wide lagoons, and then into free-floating atolls. Though the theory postulated by Charles Darwin is considered at least partially correct, some scientists today argue that the creation of the reef forms has more to do with the rise of sea level that accompanied the end of the Ice Age than with the gradual submergence of the volcanic islands to which the fringing reefs were originally attached. However, recent drillings at Enewetak atoll have uncovered a large underlay of volcanic rock, which suggests that Darwin's explanation may have been more valid after all.

Even the name given to the reefs is something of a misnomer. The Scleractinia themselves generally comprise no more than 10 percent of the biota of the average reef community: zooxanthellae can account for up to 90 percent of the reef mass, along with foraminifera, annelid worms, and assorted molluscs. Moreover, the conditions under which reef growth occurs are determined by the needs of the algae, not the corals. Reefs can flourish only in shallow, highly saline waters above 70℉, because the algae require such circumstances; yet non-reef-building corals – corals which lack the algae presence – occur worldwide under various environmental conditions, from the Arctic to the Mediterranean, home of the red coral prized for jewelry. The most likely reason that the term "coral reefs" persists is that the brilliant variety of coral shapes and colors makes aesthetic considerations more vivid than biological ones.

Anopheles Mosquitoes

Following the discovery in 1895 that malaria is carried by Anopheles mosquitoes, governments around the world set out to eradicate those insect vectors. In Europe the relation between the malarial agent, protozoan blood parasites of the genus Plasmodium, and the vector mosquito, *Anopheles maculipennis*, seemed at first inconsistent. In some localities, the mosquito was abundant but malaria rare or absent, while in others the reverse was true. In 1934 the problem was solved. Entomologists discovered that *A. maculipennis* is not a single species but a group of at least seven.

In outward appearance the adult mosquitoes seem almost identical, but in fact they are marked by a host of distinctive biological traits, some of which prevent them from hybridizing. Some of the species distinguished by these traits were found to feed on human blood and thus to carry the malarial parasites. Once identified, the dangerous members of the *A. maculipennis* complex could be targeted and eradicated.

The Antibacterial Property of Honey

An ancient use for honey was in medicine as a dressing for wounds and inflammations. Today, medicinal uses of honey are largely confined to folk medicine. On the other hand, since milk can be a carrier of some diseases, it was once thought that honey might likewise be such a carrier. Some years ago this idea was examined by adding nine common pathogenic bacteria to honey. All the bacteria died within a few hours or days. Honey is not a suitable medium for bacteria for two reasons – it is fairly acid and it is too high in sugar content for growth to occur. This killing of bacteria by high sugar content is called osmotic effect. It seems to function by literally drying out the bacteria. Some bacteria, however, can survive in the resting spore form, though not grown in honey.

Another type of antibacterial property of honey is that due to inhibine. The presence of an antibacterial activity in honey was first reported about 1940 and confirmed in several laboratories. Since then, several papers were published on this subject. Generally, most investigators agree that inhibine (name used by Dold, its discoverer, for antibacterial activity) is sensitive to heat and light. The effect of heat on the inhibine content of honey was studied by several investigators apparently, heating honey sufficiently to reduce markedly or to destroy its inhibine activity would deny it a market as first-quality honey in several European countries. The use of sucrose and inhibine assays together was proposed to determine the heating history of commercial honey.

Until 1963, when White showed that the inhibine effect was due to hydrogen peroxide produced and accumulated in diluted honey, its identity remained unknown. This material, well known for its antiseptic properties, is a byproduct of the formation of gluconic acid by an enzyme that occurs in honey, glucose oxidase. The peroxide can inhibit the growth of certain bacteria in the diluted honey. Since it is destroyed by other honey constituents, and equilibrium level of peroxides occur in a diluted honey, its magnitude depending on many factors such as enzyme activity, oxygen availability, and amounts of peroxide-destroying materials in the honey. The amount of inhibine (peroxide accumulation) in honey depends on floral type, age, and heating.

A chemical assay method has been developed that rapidly measures peroxide accumulation in diluted honey. By this procedure, different honeys have been found to vary widely in the sensitivity of their inhibine to heat. In general, the sensitivity is about the same as or greater than that of invertase and diastase in honey.

Termites

It is well known that termites are blind, but little has been discovered about the other sense organs of these insects or their reactions to various stimuli. Body odors, as well as odors related

to sex and to colony, certainly play a part in the activities of the termite colony. When specimens of eastern subterranean termites are placed in a jar containing a colony of rotten wood termites from the Pacific coast, the host termites recognize these foreign insects by differences in odor and eventually kill the invaders. The progress of the chase and kill is very slow, and the larger host termites appear awkward in their efforts to bite and kill their smaller but quicker-moving cousin. Finally, more or less by sheer numbers and by accident, they corner and exterminate the enemy.

Eastern dealated (wingless) termites that manage to survive in the rotten wood termite colony for more than a week, however, are no longer molested. This is noteworthy, since eastern termites of this variety had previously been pursued and killed. Fresh eastern wingless specimens placed in the colony alongside the week-old visitors are immediately attacked, thus indicating that the rotten wood termites have in no way lost their capacity for belligerence.

What else besides odor helps termites interpret the world around them? The insects have sense or "chorodontal" organs located on the antennae, on the bristles, on the base of the mandibles, and on the legs. These organs apparently enable termites to receive vibrations sent through the air, or, more precisely, aid in the reception of stimuli sent through the nest material or through air pockets within the nest material. When alarmed, soldier termites exhibit synchronous, convulsive movements that appear to be a method of communication adapted to the chorodontal organ system, although no sound that is audible to man is produced by these movements. Termite soldiers also strike their heads against wood and other nest materials, producing noises that, after passing through the sounding board formed by the nest material, become rustling and crackling sounds plainly audible to man's duller and possibly differently attuned perceptions. In fact, soldiers of one termite species, found in the arid regions of California, strike their heads against the dry, dead flower stalks of Spanish bayonets and agave plants with such force that the sound produced can be heard several feet away. Other types of soldier termites found in the tropics make audible clicking noises with their jaws.

There is a clear correlation between the functioning of the chorodontal system and termite settlement patterns. Seldom are termites found infesting railroad ties over which there is frequent heavy traffic, or on the woodwork of mill or factory buildings where heavy machinery in motion would cause vibrations. Small scale tests with a radio speaker and vibrator yielded interesting results when termites were placed in the speaker and exposed to various frequency vibration. When the vibrations ranged from 50-100 per second, the termites were thrown about; at vibrations of 100-500, termites set their feet and mandibles and held on with all their power; at 2,000-5,000 vibrations per second, the termites crawled about undisturbed.

Insecticides

Traditional strategies for controlling insect-pests tend to rely on the use of nonselective insecticides that cause extensive ecological disruption. The alternative sterile-insect technique, in

which members of the target species are irradiated to cause sterility, has enjoyed some modest success. When released into an infested area, the sterile insects mate with normal insects but produce no offspring. Unfortunately, the irradiation weakens the insects, making it less likely that they will mate; and, in any event, sterile insects do not search selectively for non-sterile mates. A third, newly developed strategy is based on parasite release.

Pest hosts and their associated parasites have evolved biological and behavioral characteristics that virtually ensure that the relative numbers of hosts and parasites in the ecosystem they inhabit remain within relatively narrow limits – even though coexisting populations may fluctuate up to 100-fold during a single season. The close numerical relationships are entirely consistent with nature's balancing mechanisms, which permit closely associated organisms to live together in harmony. Thus, in natural populations, the ratios of parasites to hosts are not high enough to result in dependable control. However, it is possible to mass-rear parasites so that they can be released at strategic times and in numbers that result in parasite-to-host ratios sufficient to control host populations.

Biosteres tryoni, for example, has a strong affinity for medfly larvae. Let us assume that a new medfly infestation is discovered. It is likely to have originated from a single female and, even in an area with a good surveillance program, to be in the third reproductive cycle. The rate of population increase is 10-fold per generation; so at the time the infestation comes to light, about 1,000 males and 1,000 females are emerging and will produce a total of approximately 80,000 larvae. Reproduction will be concentrated in an area of about one square mile, but scattered reproduction will occur anywhere within a 25-square mile area. At first glance, the odds of controlling the infestation by parasite release seem low; but with new techniques for mass-producing parasites, it is possible to release one million males and one million females into the infested area. This would mean an average of 62 females per acre, and the average female parasitizes about 30 host larvae during its lifetime. Additionally, the parasites actively search for host habitats by using the kairomone signals emanating from infested fruit. Even assuming that only 10 percent of the released females are successful and further that they parasitize an average of only 10 larvae, they could still parasitize one million larvae. Only 80,000 larvae are available, however, so the actual ratio would be 12.5:1. A ratio as low as 5:1 results in 99 percent parasitism.

This method of pest eradication presents no health or environmental problems and is actually cheaper. The cost of mass-rearing and distributing B. tryoni is about $ 2,000 per million. So even if six million parasites of both sexes are released during a period corresponding to three medfly reproductive cycles, the total cost of the treatment would be $ 12,000 – compared to $ 25,000 for a single insecticide spray application to the same 25-square mile area.

Adaptive Divergence

Both plants and animals of many sorts show remarkable changes in form, structure, growth

habits, and even mode of reproduction in becoming adapted to different climatic environment, types of food supply, or mode of living. The divergence in response to evolution is commonly expressed by altering the form and function of some part or parts of the organism, the original identity of which is clearly discernible. For example, the creeping foot of the snail is seen in related marine pteropods to be modified into a flapping organ useful for swimming, and is changed into prehensile arms that bear suctorial disks in the squids and other cephalopods. The limbs of various mammals are modified according to several different modes of life – for swift running (cursorial) as in the horse and antelope, for swinging in trees (arboreal) as in the monkeys, for digging (fossorial) as in the moles and gophers, for flying (volant) as in the bats, for swimming (aquatic) as in the seals, whales and dolphins, and for other adaptations. The structures or organs that show main change in connection with this adaptive divergence are commonly identified readily as homologous, in spite of great alterations. Thus, the finger and wristbones of a bat and whale, for instance, have virtually nothing in common except that are definitely equivalent elements of the mammalian limb.

Adaptive Convergence

The opposite of adaptive divergence is an interesting and fairly common expression of evolution. Whereas related groups of organisms take on widely different characters in becoming adapted to unlike environments in the case of adaptive divergence, we find that unrelated groups of organisms exhibit adaptive convergence when they adopt similar modes of life or become suited for special sorts of environments. For example, invertebrate marine animals living firmly attached to the sea bottom or to some foreign object tend to develop a subcylindrical or conical form. This is illustrated by coral individuals, by many sponges, and even by the diminutive tubes of bryozoans. Adaptive convergence in taking this coral-like form is shown by some brachiopods and pelecypods that grew in fixed position. More readily appreciated is the streamlined fitness of most fishes for moving swiftly through water; they have no neck, the contour of the body is smoothly curved so as to give minimum resistance, and the chief propelling organ is a powerful tail fin. The fact that some fossil reptiles (ichthyosaurs) and modern mammals (whales, dolphins) are wholly fishlike in form is an expression of adaptive convergence, for these air-breathing reptiles and mammals, which are highly efficient swimmers, are not closely related to fishes. Unrelated or distantly related organisms that develop similarity of form are sometimes designated as homeomorphs (having the same form).

Endangered Species

All along the chain of biological evolution, the extinction of species appears to have been a stage in the process of adapting genetic lineages to changing environmental conditions. Although some catastrophic extinction occurred naturally, producing total loss of a genetic line, such catastrophes were comparatively rare. In modern times, however, human activities have altered

the fundamental nature of this process, resulting in nearly total genetic losses.

It is difficult to gain general agreement that man-induced increases in the endangerment and extinction of wildlife – whether due to habitat alteration or loss, pollution, insufficiently regulated hunting, or other factors – are undesirable. It is, however, more difficult to obtain consensus when consideration is given to the economic costs of correcting such trends, including natural habitat preservation, regulation of pesticides and other toxic substances, and wildlife and park management. Endangered species often are, in effect, competitors with humans for habitat and other resources which also provide other kinds of human uses and needs.

Measures needed to protect endangered species vary considerably in difficulty and cost. Of the approximately 400 invertebrate species which at present appear to be threatened, for example, about one-third could probably be restored by such inexpensive means as modifying the boundaries of designated natural areas, acquiring and protecting caves and other small areas which contain the particular species, and additional management of parks and refuges.

Another one-third of the endangered lower animal species are threatened principally by water pollution and could be protected by improved control, particularly of five southern rivers. The remaining one-third of the 400 endangered shellfish species would be considerably more difficult to protect. These are threatened by complex factors, such as overcollecting, channelization, highway and housing development, dams, introduced species such as the Asian snail, dredging, quarry washing, poor erosion control, and lowering of water tables.

The identification of threatened species and other significant wildlife trends must precede any corrective measures, and our knowledge base for making such identification is deficient in many respects. Our present lists of threatened species and subspecies are known to be incomplete, except in those geographical areas which contain habitats of species that have important commercial or sports harvest value.

Objections to Darwin's Theory

After a major theory has become doctrine, we tend to forget seemingly legitimate objections later shown to be incorrect, remembering only the controversial aspects of those theories. This leads to retrospective arrogance: by aligning ourselves with the victorious doctrine, we disdain those who opposed it.

Although much has been written about the theological conflicts with Darwinian theory, little is known of the powerful scientific objections that modified Darwin's beliefs.

During Darwin's lifetime, the accepted theory of heredity was that of blending inheritance, in which forms intermediate between those of the parents resulted from mating. Mendel's discovery that inheritance was particulate was published, but was unrecognized. Jerkin pointed out that if a

rare and favorable mutation occurred, it would soon be obliterated due to "swamping" from repeated crossings from the wild-type form. Disputing Darwin's conception of evolution as proceeding through the natural selection of those with slightly better characteristics than arose randomly, Jerkin concluded that natural selection could not account for the tremendous diversity of life, hypothesizing that large numbers of organisms mutated simultaneously in the same direction – a controlled orthogenetic process resembling a series of "special creations".

Since "special creationism" was an ideological target of Darwin's, he found himself in a quandary. Although he did not abandon his theory, he admitted that natural selection played a much smaller part in evolution than he had previously claimed. He also embraced the Lamarckian concept that somatic changes in parents are transmitted to their offspring, thus providing a mechanism by which an entire population could change in the same direction at once.

Another potent objection came from the physicists led by Lord Kelvin, who contested the assumption of previous geologists and biologists that life had existed for billions of years, if not infinitely. How, these iconoclasts questioned, could evolution proceed by slow steps in millions of years, and how could advanced forms, recently evolved, show such great differences? The Kelvinists, basing their conclusions on the assumption that the sun was an incandescent liquid mass rapidly radiating heat, calculated that the age of the earth was between twenty and forty million year.

Darwin was forced to admit that their calculations were correct and their premises rational, and to adjust his theory, he proposed that change had occurred much more rapidly in the past than in the present, where species seemed static, and that more advanced forms varied more rapidly than lower forms. This provided further reason to advocate Lamarck's theory of inheritance, because that could account for the rapid change.

It is interesting to note that both these retreats of Darwin were later shown to be faulty. The discovery that the sun runs on a nearly infinite amount of atomic fuel totally invalidated Kelvin's argument. Mendel was "rediscovered" in the twentieth century, when it was pointed out that the particulate nature of inheritance meant that favorable mutation could not only persist, but could rapidly become prevalent.

Darwinian Theory

Yet, while Darwinian theory extends its domain, some of its cherished postulates are slipping, or at least losing their generality. The "modern synthesis", the contemporary version of Darwinism that has reigned for thirty years, took the model of adaptive gene substitution within local populations as an adequate account, by accumulation and extension, of life's entire history. The model may work well in its empirical domain of minor, local, adaptive adjustment; populations of the moth *Biston betularia* did turn black, by substitution of a single gene, as a selected response for decreased visibility on trees that had been blackened by industrial soot. But is the

origin of a new species simply this process extended to more genes and greater effect? Are larger evolutionary trends within major lineages just a further accumulation of sequential adaptive changes?

Many evolutionists (myself included) are beginning to challenge this synthesis and to assert the hierarchical view that different levels of evolutionary change often reflect different kinds of causes. Minor adjustment within populations may be sequential and adaptive. But speciation occur by major chromosomal changes that establish sterility with other species for reasons unrelated to adaptation. Evolutionary trends may represent a kind of higher-level selection upon essentially static species themselves, not the slow and steady alteration of a single large population through untold ages.

Before the modern synthesis, many biologists (see Bateson, 1922, in bibliography) expressed confusion and depression because the proposed mechanisms of evolution at different levels seemed contradictory enough to preclude a unified science. After the modern synthesis, the notion spread (amounting almost to a dogma among its less thoughtful lieutenants) that all evolution could be reduced to the basic Darwinism of gradual, adaptive change within local populations. I think that we are now pursuing a fruitful path between the anarchy of Bateson's day and the restriction of view imposed by the modern synthesis. The modern synthesis works in its appropriate arena, but the same Darwinian processes of mutation and selection may operate in strikingly different ways at higher domains in a hierarchy of evolutionary levels. I think that we may hope for uniformity of causal agents, hence a single, general theory with a Darwinian core. But we must reckon with a multiplicity of mechanisms that preclude the explanation of higher level phenomena by the model of adaptive gene substitution favored for the lowest level.

At the basis of all this ferment lies nature's irreducible complexity. Organisms are not billiard balls, propelled by simple and measurable external forces to predictable new positions on life's pool table. Sufficiently complex systems have greater richness. Organisms have a history that constrains their future in myriad, subtle ways. Their complexity of form entails a host of functions incidental to whatever pressures of natural selection superintended the initial construction. Their intricate and largely unknown pathways of embryonic development guarantee that simple inputs (minor changes in timing, for example) may be translated into marked and surprising changes in output (the adult organism).

Charles Darwin chose to close his great book with a striking comparison that expresses this richness. He contrasted the simpler system of planetary motion, and its result of endless, static cycling, with the complexity of life and its wondrous and unpredictable change through the ages.

There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

Genetic Variation

Genetic variation is also important in the evolution of lower organisms such as bacteria, and here too it arises from mutations. Bacteria have only one chromosome, however, so that different alleles or variant forms of a gene are not normally present within a single cell. The reshuffling of bacterial genes therefore ordinarily requires the introduction into a bacterium of DNA carrying an allele that originated in a different cell. One mechanism accomplishing this interbacterial transfer of genes in nature is transduction: certain viruses that can infect bacterial cells pick up fragments of the bacterial DNA and carry the DNA to other cells in the course of a later infection. In another process, known as transformation, DNA released by cell death or other natural processes simply enters a new cell from the environment by penetration the cell wall and membrane. A third mechanism, conjugation, involves certain of the self-replicating circular segments of DNA called plasmids, which can be transferred between bacterial cells that are in direct physical contact with each other.

Whether the genetic information is introduced into a bacterial cell by transduction, transformation or conjugation, it must be incorporated into the new host's hereditary apparatus if it is to be propagated as part of that apparatus when the cell divides. As in the case of higher organisms, this incorporation is ordinarily accomplished by the exchange of homologous DNA; the entering gene must have an allelic counterpart in the recipient DNA. Because homologous recombination requires overall similarity of the two DNA segments, it can take place only between structurally and ancestrally related segments. And so, in bacteria as well as in higher organisms, the generation of genetic variability is limited to what can be attained by exchanges between different alleles of the same genes or between different genes that have stretches of similar nucleotide sequences. This requirement imposes severe constraints on the rate of evolution that can be attained through homologous recombination.

Until recently mutation and homologous recombination nevertheless appeared to be the only important mechanisms for generating biological diversity. They seemed to be able to account for the degree of diversity observed in most species, and the implicit constraints of homologous recombination – which prevent the exchange of genetic information between unrelated organisms lacking extensive DNA-sequence similarity – appeared to be consistent with both a modest rate of biological evolution and the persistence of distinct species that retain their basic identity generation after generation.

Within the past decade or so, however, it has become increasingly apparent that there are various "illegitimate" recombinational processes, which can join together DNA segments having little or no nucleotide-sequence homology, and that such processes play a significant role in the organization of genetic information and the regulation of its expression. Such recombination is often effected by transposable genetic elements: structurally and genetically discrete segments of DNA that have the ability to move around the chromosomes and the extrachromosomal DNA molecules or bacteria and higher organisms. Although transposable elements have been studied largely in bacteria cells, they were originally discovered in plants and are now known to exist in

animals as well. Because illegitimate recombination can join together DNA segments that have little, if any, ancestral relationship, it can affect evolution in quantum leaps as well as in small steps.

Why Organisms Age

The reasons organisms age have been much discussed. Some have claimed that senescence is a mechanism for culling the aged from the population to prevent overcrowding. Others have believed aging to be the unavoidable outcome of tissue metabolism. Still others have felt the question of senescence to be largely irrelevant since few wild organisms ever reach the senile state. Modern evolutionary theory has a rationale for senescence which has a firm theoretical base: natural selection of individuals.

One should be skeptical of the claim that organisms deteriorate with age as an inevitable outcome of living. Considering the complex morphogenetic changes many organisms undergo during development, it would seem that maintaining what has been formed should be relatively simple. A valid theory of senescence must explain why salmon usually deteriorate rapidly and die after spawning, at an age of two or three, while trees and tortoises may live for hundreds of years without degeneration.

Senescence, in and of itself, can never help the individual's Darwinian fitness. All else being equal, an organism's chances of perpetuating its genes are better if it is healthy rather than sick, alive rather than dead. If senescence is to be compatible with natural selection, there must be some concomitant benefit associated with it that outweighs its disadvantage. Since Darwinian fitness is measured by total reproduction, the advantage must be that senescence is inextricably tied up with reproductive effort.

Consider that all organisms have a finite probability of dying of natural causes within any given time period. This puts a premium on reproducing sooner rather than later. In other words, an organism's Darwinian fitness tends to be enhanced by not deferring reproduction till a later time, for that organism might be killed or injured in the interim. The degree of risk of an organism is subject to determines how much pressure there is to reproduce soon.

An insect, for example, may have a ten percent chance of being killed each day; it is not surprising that insects have high reproductive rates, and high rates of senescence. Tortoises, on the other hand, have heavy shells which presumably provide efficient protection against predation and injury; because their mortality risk is low, they are able to rely on long lives and can defer reproduction until times are most favorable. Their senescence rates are low.

If an organism is able to have more offspring as it ages, it experiences an evolutionary pressure opposing that caused by mortality. In such cases, low senescence rates are favored to take advantage of the increased reproductive rate at future times. This theory would predict that

female fish which produce more eggs as they grow older and larger would age at a much slower rate than male fish whose sperm production does not rise with size.

This line of reasoning suggests that when organisms have little or no chance of reproducing, they tend to die early as a result of physical degenerative changes called senescence. But how, then, does this hypothesis explain the continued survival of humans well past reproductive age? Why do human females live long lives after menopause has marked the end of their ability to bear further offspring? There are at least two explanations. One is that this situation is an evolutionary anomaly: primitive people rarely lived past fifty. But a more complete explanation is that postreproductive people can advance their reproductive fitness through parental and grandparental care of their descendants: by furnishing advice, food, protection, a place in society, among other things, they can greatly advance the future reproduction of their already existing descendants.

Photosynthesis

Studies of photosynthesis began in the late eighteenth century. One scientist found that green plants produce a substance (later shown to be oxygen) that supports the flame of a candle in a closed container. Several years later it was discovered that a plant must be exposed to light in order to replenish this flame-sustaining "substance". Soon another discovery showed that the oxygen is formed at the expense of another gas, carbon dioxide.

In 1804, De Saussure conducted experiments revealing that equal volumes of carbon dioxide and oxygen are exchanged between a plant and the air surrounding it. De Saussure determined that the weight gained by a plant grown in a pot equals the sum of the weights of carbon derived from absorbed carbon dioxide and water absorbed through plant roots. Using this information, De Saussure was able to postulate that in photosynthesis carbon dioxide and water combine using energy in the form of light to produce carbohydrates, water, and free oxygen. Much later, in 1845, scientists' increased understanding of concepts of chemical energy led them to perceive that, through photosynthesis, light energy is transformed and stored as chemical energy.

In the twentieth century, studies comparing photosynthesis in green plants and in certain sulfur bacteria yielded important information about the photosynthetic process. Because water is both a reactant and a product in the central reaction, it had long been assumed that the oxygen released by photosynthesis comes from splitting the carbon dioxide molecule. In the 1930's, however, this popular view was decisively altered by the studies of C.B. van Niel. Van Niel studied sulfur bacteria, which use hydrogen sulfide for photosynthesis in the same way that green plants use water, and produce sulfur instead of oxygen. Van Niel saw that the use of carbon dioxide to form carbohydrates was similar in the two types of organisms. He reasoned that the oxygen produced by green plants must derive from water – rather than carbon dioxide, as previously assumed – in the same way that the sulfur produced by the bacteria derives from hydrogen sulfide. Van Niel's finding was important because the earlier belief had been that oxygen was split off from carbon

dioxide, and that carbon then combined with water to form carbohydrates. The new postulate was that, with green plants, hydrogen is removed from water and then combines with carbon dioxide to form the carbohydrates needed by the organism.

Later, van Niel's assertions were strongly backed by scientists who used water marked with a radioactive isotope of oxygen in order to follow photosynthetic reactions. When the photosynthetically produced free oxygen was analyzed, the isotope was found to be present.

Genetics and Inheritance

Although genetics is all about inheritance, inheritance is certainly not all about genetics. Nearly all inherited characters more complicated than a single change in the DNA involve gene and environment acting together. It is impossible to sort them into convenient compartments. An attribute such as intelligence is often seen as a cake which can be sliced into so much "gene" and so much "environment". In fact, the two are so closely blended that trying to separate them is more like trying to unbake the cake. Failure to understand this simple biological fact leads to confusion and worse.

Not far from Herbert Spencer's (and his neighbor Karl Marx's) tomb, in Hampstead – a notably affluent part of London – is a large red-brick house. It was occupied by Sigmund Freud after he fled Austria to avoid racial policies which descended from the Galtonian ideal. On his desk is a collection of stone axes and ancient figurines. Freud's interest in these lay in his belief that behavior is controlled by biological history.

Everyone, he thought, recapitulates during childhood the phases which humans experienced during evolution. Freud saw unhappiness as a sort of living fossil, the emergence of ancient behavior which was inappropriate today. Like Galton he viewed the human condition as formed by inheritance. The libido and ego are, he wrote, "at bottom heritages, abbreviated recapitulations of the development which all mankind has passed through from its primeval days." Freud hoped that once he had uncovered the inherited fault which underlies mental illness, he might be able to cure it.

Today's Freudians have moved away from their master's Galtonizing of behavior. They feel that nurture is more important. Analysis looks for childhood events rather than race-memories. In so doing it is in as much danger as was Freud of trying to unbake the cake of human nature. Any attempt to do so is likely to prove futile.

The Siamese cat shows how futile the task may be. Siamese have black fur on the tips of the ears, the tail and the feet, but are white or light brown elsewhere. The cats carry the "Himalayan" mutation, which is also found in rabbits and guinea pigs (but not, unfortunately, in humans). Breeding experiments show that a single gene inherited according to Mendel's laws is involved. At first sight, then, the Siamese cat fur is set in its nature: if coat color is controlled by just one

gene then surely there is no room for nurture to play a part.

However, the Himalayan mutation is odd. The damaged gene cannot produce pigment at normal body temperature but works perfectly if it is kept cool. This is why the colder parts of the cat's body, its ears, nose, and tail (and, for a male, its testicles) are darker than the rest. An unusually dark cat can be produced by keeping a typical Siamese in the cold and a light one by bringing it up in a warm room. Inside every Siamese is a black cat struggling to get out. It is meaningless to ask whether its pattern is due to gene or environment. It is due to both. What the Siamese cat – and every living creature – inherits is an ability to respond to the environment in which it is placed.

Taxonomy

Taxonomy, the science of classifying and ordering organisms, has an undeserved reputation as a harmless, and mindless, activity of listing, cataloguing, and describing – consider the common idea of a birdwatcher, up at 5:30 in the morning with binoculars, short pants, and "life list" of every bird he has seen. Even among scientists, taxonomy is often treated as "stamp collecting". It was not always so. During the eighteenth and early nineteenth centuries, taxonomy was in the forefront of the sciences. The greatest biologists of Europe were professional taxonomists – Linnaeus, Cuvier, Lamarck. Darwin's major activity during the twenty years separating his Malthusian insights from the publication of his evolutionary theory was a three-volume work on the taxonomy of barnacles. Thomas Jefferson took time out from the affairs of state to publish one of the great taxonomic errors in the history of paleontology – he described a giant sloth claw as a lion's three times the size of Africa's version. These heady days were marked by discovery as naturalists collected the fauna and flora of previously uncharted regions. They were also marked by the emergence of intellectual structure, as coherent classifications seemed to mirror the order of God's thought.

America played its part in this great epoch of natural history. We often forget that 150 years ago much of our continent was as unknown and potentially hazardous as any place on earth. During the eighteenth century, when most naturalists denied the possibility of extinction, explorers expected to find mammoths and other formidable fossil creatures alive in the American West. There are a number of passionate, single-minded iconoclasts who fought the hostility of the wildness, and often of urban literary people, to disclose the rich fauna and flora of America. For the most part, they worked alone, with small support from patrons or government. The Lewis and Clark expedition is an exception – and its primary purpose was not natural history. We may now look upon tales of frontier toughness and perseverance as the necessary mythology of a nation too young to have real legends. But there is often a residue of truth in such tales, and naturalists are among the genuine pioneers.

Alexander Wilson walked from New England to Charleston peddling subscriptions to his American Ornithology. Thomas Nuttall – oblivious to danger, a Parsifal under a lucky star,

vanquishing every Klingsor in the woods, discovered some of the rarest, most beautiful, and most useful of American plants. J.J. Audubon drank his way across Europe selling his beautiful pictures of birds to lords and kings. John Lawson, captured by Tuscarora Indians, met the following fate according to an eyewitness: "They struck him full of fine small, splinters or torchwoods like hog's bristles and so set them gradually afire." David Douglas fell into a pit trap for wild cattle and was stomped to death by a bull.

第二部分　　医学、生理学

Theories about Alcoholism

One of the many theories about alcoholism is the learning and reinforcement theory, which explains alcoholism by considering alcohol ingestion as a reflex response to some stimulus and as a way to reduce an inner drive state such as fear or anxiety. Characterizing life situations in terms of approach and avoidance, this theory holds that persons tend to be drawn to pleasant situations and repelled by unpleasant ones. In the latter case, alcohol ingestion is said to reduce the tension or feelings of unpleasantness and to replace them with the feeling of euphoria generally observed in most persons after they have consumed one or more drinks.

Some experimental evidence tends to show that alcohol reduces fear in an approach-aversion situation. Conger trained one group of rats to approach a food goal and, using aversion conditioning, trained another group to avoid electric shock. After an injection of alcohol the pull away from the shock was measurably weaker, while the pull toward the food was unchanged.

The obvious troubles experienced by alcoholic persons appear to contradict the learning theory in the explanation of alcoholism. The discomfort, pain, and punishment they experience should presumably serve as a deterrent to drinking. The fact that alcoholic persons continue to drink in the face of family discord, loss of employment, illness, and other sequels of repeated bouts is explained by the proximity of the drive reduction to the consumption of alcohol; that is, alcohol has the immediate effect of reducing tension while the unpleasant consequences of drunken behavior come only later. The learning paradigm, therefore, favors the establishment and repetition of the resort to alcohol.

In fact, the anxieties and feeling of guilt induced by the consequences of excessive alcohol ingestion may themselves become the signal for another bout of alcohol abuse. The way in which the cue for another bout could be the anxiety itself is explained by the process of stimulus generalization: conditions or events occurring at the time of reinforcement tend to acquire the characteristics of stimuli. When alcohol is consumed in association with a state of anxiety or fear, the emotional state itself takes on the properties of a stimulus, thus triggering another drinking bout.

The role of punishment is becoming increasingly important in formulating a cause of alcoholism based on the principles of learning theory. While punishment may serve to suppress a response, experiments have shown that in some cases it can serve as a reward and reinforce the behavior. Thus if the alcoholic person has learned to drink under conditions of both reward and punishment, either type of condition may precipitate renewed drinking.

Ample experimental evidence supports the hypothesis that excessive alcohol consumption can be

learned. By gradually increasing the concentration of alcohol in drinking water, psychologists have been able to induce the ingestion of larger amounts of alcohol by an animal than would be normally consumed. Other researchers have been able to achieve similar results by varying the schedule of reinforcement – that is, by requiring the animal to consume larger and larger amounts of the alcohol solutions before rewarding it. In this manner, animals learn to drink enough to become dependent on alcohol in terms of demonstrating withdrawal symptoms.

Chronic Fatigue Syndrome

Studies have shown that certain components of the immune system behave abnormally in people with chronic fatigue syndrome. Chemicals called interleukin-2 and gamma interferon, which the body produces during its battle against cancer and infectious agents, may not be made in normal amounts. There is evidence that a low-grade battle is being waged by the immune system of CFS patients, given the slight increase in the number of white cells that usually accumulate in the blood when people are fighting off an infection. Natural killer cells, though, that also help the body in this battle are found in slightly reduced numbers. It's important to note that clinical depression has the identical small reduction in natural killer-cell activity. In addition, some depressed patients produce higher amounts of antibodies to certain viruses. There may be more of a connection between depression, the immune system, and chronic fatigue syndrome than is realized even now, which introduces the somewhat controversial aspect of the syndrome, its neuropsychological features.

Antipsychotic Medication

In the 1950s, the development of antipsychotic drugs called neuroleptics radically changed the clinical outlook for patients in mental institutions who had previously been considered hopelessly psychotic. Daily medication controlled delusions and made psychotherapy possible. Many who otherwise might never have left institutions returned to society. Now physicians have learned that there is a price to be paid for these benefits. Approximately 10 to 15 percent of patients who undergo long-term treatment with antipsychotic drugs develop a cluster of symptoms called tardive dyskinesia, the most common symptoms of which are involuntary repetitive movement of the tongue, mouth, and face, and sometimes the limbs and trunk.

Neuroleptic drugs interfere with the action of dopamine, an important neurotransmitter in the brain, by binding to the dopamine receptors of nerve cells, and dopamine is a prime suspect in the pathophysiology of schizophrenia. Large doses of drugs such as amphetamines, which stimulate secretion of dopamine, produce a psychosis resembling schizophrenia. Reducing the activity of this neurotransmitter alleviates the delusions that cause psychotic behavior. Although the inhibition of dopamine activity can control psychotic behavior, researchers now believe that the central nervous system of some patients adapts to long-term therapy by increasing the

number of specific dopamine binding sites. The net result is dopamine hypersensitivity, which is correlated with the subsequent appearance of tardive dyskinesia.

The risk of developing tardive dyskinesia is not so great that doctors have considered abandoning the use of antipsychotic drugs. Patients generally are bothered only slightly by the physical side effects, though the abnormal movement are troubling and may hinder social adjustment. Additionally, early diagnosis and prompt discontinuation of the neuroleptics might decrease the incidence of the movement disorders. Unfortunately, without neuroleptic drugs, psychotic behavior returns. So researchers have tried to achieve a satisfactory balance between the two effects, lowering dosage to a level that minimizes movement disorders yet controls psychosis. In a five-year study of twenty-seven psychiatric patients treated with neuroleptics representing all classes of antipsychotic drugs, researchers attempted to decrease drug doses to their lowest effective levels. Patient responses suggested that low to moderate doses of antipsychotic drugs could control psychoses just as well as high doses, and tardive dyskinesia symptoms stabilized and gradually diminished or completely disappeared.

The fact that psychoses can be controlled at the same time that tardive dyskinesia symptoms are reduced suggests that a drug more specifically affecting the mechanism of psychoses might not cause movement disorders. Sulpiride, a drug not available in the United States but widely used in Europe, where it was developed, may be one such alternative. The drug selectively block D-2 dopamine receptors, perhaps especially those in the limbic area of the brain, which is involved in emotion and behavior. It does not adversely affect the adenylate cyclase-linked D-1 dopamine receptors. Sulpiride has proven effective in the short term, but whether it suppresses tardive dyskinesia over a long period of treatment is not yet known.

Mental Health Care

The mental health movement in the United States began with a period of considerable enlightenment. Dorothea Dix was shocked to find the mentally ill in jails alms houses and crusaded for the establishment of asylums in which people could receive humane care in hospital-like environments and treatment which might help restore them to sanity. By the mid-1800s, 20 states had established asylums, but during the late 1800s and early 1900s, in the face of economic depression, legislatures were unable to appropriate sufficient funds for decent care. Asylums became overcrowded and prisonlike. Additionally, patients were more resistant to treatment than the pioneers in the mental health field had anticipated, and security and restraint were needed to protect patients and others. Mental institutions became frightening and depressing places in which the rights of patients were all but forgotten.

These conditions continued until after World War II. At that time, new treatments were discovered for some major mental illnesses theretofore considered untreatable (penicillin for syphilis of the brain and insulin treatment for schizophrenia and depression), and a succession of books, motion pictures, and newspaper exposes called attention to the plight of the mentally ill.

Improvements were made, and Dr. David Vail's Humane Practices program is a beacon for today. But changes were slow in coming until the early 1960s. At that time, the Civil Rights Movement led lawyers to investigate America's prisons, which were disproportionately populated by blacks, and they in turn followed prisoners into the only institutions that were worse than the prisons – the hospitals for the criminally insane. The prisons were filled with angry young men who, encouraged by legal support, were quick to demand their rights. The hospitals for the criminally insane, by contrast, were populated with people who were considered "crazy" and who were often kept obediently in their place through the use of severe bodily restraints and large doses of major tranquilizers. The young cadre of public interest lawyers liked their role in the mental hospitals. The lawyers found a population that was both passive and easy to champion. These were, after all, people who, unlike criminals, had done nothing wrong. And in many states they were being kept in horrendous institutions, an injustice which, once exposed, was bound to shock the public and, particularly, the judicial conscience. Patients' right groups successfully encouraged reform by lobbying in state legislatures.

Judicial interventions have had some definite positive effects, but there is growing awareness that courts cannot provide the standards and the review mechanisms that assure good patient care. The details of providing day-to-day care simply cannot be mandated by a court, so it is time to take from the courts the responsibility for delivery of mental health care and assurance of patient rights and return it to the state mental health administrators to whom the mandate was originally given. Though it is a difficult task, administrators must undertake to write rules and standards and to provide the training and surveillance to assure that treatment is given and patients' rights are respected.

"Drug Lag"

From the time they were first proposed, the 1962 Amendments to the Food, Drug and Cosmetic Act have been the subject to controversy among some elements of the health community and the pharmaceutical industry. The Amendments added a new requirement for Food and Drug Administration approval of any new drug: The drug must be demonstrated to be effective by substantial evidence consisting of adequate and well-controlled investigations. To meet this effectiveness requirement, a pharmaceutical company must spend considerable time and effort in clinical research before it can market a new product in the United States. Only then can it begin to recoup its investment. Critics of the requirement argue that the added expense of the research to establish effectiveness is reflected in higher drug costs, decreased profits, or both, and that this has resulted in a "drug lag".

The term drug lag has been used in several different ways. It has been argued that the research required to prove effectiveness creates a lag between the time when a drug could theoretically be marketed without proving effectiveness and the time when it is actually marketed. Drug lag has also been used to refer to the difference between the number of new drugs introduced annually before 1962 and the number of new drugs introduced each year after that date. It's also argued

that the Amendments resulted in a lag between the time when new drugs are available in other countries and the time when the same drugs are available in the United States. And drug lag has also been used to refer to a difference in the number of new drugs introduced per year in other advanced nations and the number introduced in the same year in the United States.

Some critics have used drug lag arguments in an attempt to prove that the 1962 Amendments have actually reduced the quality of health care in the United States and that, on balance, they have done more harm than good. These critics recommend that the effectiveness requirements be drastically modified or even scrapped. Most of the specific claims of the drug lag theoreticians, however, have been refuted. The drop in new drugs approved annually, for example, began at least as early as 1959, perhaps five years before the new law fully effective. In most instances, when a new drug was available in a foreign country but not in the United States, other effective drugs for the condition were available in this country and sometimes not available in the foreign country used for comparison. Further, although the number of new chemical entities introduced annually dropped from more than 50 in 1959 to about 12 to 18 in the 1960's and 1970's, the number of these that can be termed important – some of them of "breakthrough" caliber – has remained reasonably close to 5 or 6 per year. Few, if any, specific examples have actually been offered to show how the effectiveness requirements have done significant harm to the health of Americans. The requirement does ensure that a patient exposed to a drug has the likelihood of benefiting from it, an assessment that is most important, considering the possibility, always present, that adverse effects will be discovered later.

Health Problems in U.S.

The most damning thing that can be said about the world's best-endowed and richest country is that it is not only not the leader in health status, but that it is so low in the ranks of the nations. The United States ranks 18th among nations of the world in male life expectancy at birth, 9th in female life expectancy at birth, and 12th in infant mortality. More importantly, huge variations are evident in health status in the United States from one place to the next and from one group to the next.

The forces that affect health can be aggregated into four groupings that lend themselves to analysis of all health problems. Clearly the largest aggregate of forces resides in the person's environment. His own behavior, in part derived from his experiences with his environment, is the next greatest force affecting his health. Medical care services, treated as separate from other environmental factors because of the special interest we have in them, make a modest contribution to health status. Finally, the contributions of heredity to health are difficult to judge. We are templated at conception as to our basic weaknesses and strengths, but many hereditary attributes never become manifest because of environmental and behavioral forces that act before the genetic forces come to maturity and other hereditary attributes are increasingly being palliated by medical care.

No other country spends what we do per capita for medical care. The care available is among the best technically, even if used too lavishly and thus dangerously, but none of the countries which stand above us in health status have such a high proportion of medically disenfranchised persons. Given the evidence that medical care is not that valuable and access to care not that bad, it seems most unlikely that our bad showing is caused by the significant proportion who are poorly served. Other hypotheses have greater explanatory power: excessive poverty, both actual and relative, and excessive affluence.

Excessive poverty is probably more prevalent in the United States than in any of the countries that have a better infant mortality rate and female life expectancy at birth. This is probably true also for all but four of five of the countries with a longer male life expectancy. In the notably poor countries that exceed us in male survival, difficult living conditions are a more accepted way of life, and, in several of them, a good basic diet, basic medical care, basic education and lifelong employment opportunities are an everyday fact of life. In the United States a national unemployment level of 10 percent may be 40 percent in the ghetto, while less than 4 percent elsewhere. The countries that have surpassed us in health do not have such severe or entrenched problems. Nor are such a high proportion of their people involved in them.

Excessive affluence is not so obvious a cause of ill health, but, at least until recently, few other nations could afford such unhealthful ways of living. Excessive intake of animal protein and fats, dangerous imbibing of alcohol, use of tobacco and drugs (prescribed and proscribed), and dangerous recreational sports and driving habits are all possible only because of affluence. Our heritage, desires, opportunities and our macho, combined with the relatively low cost of bad foods and speedy vehicles, make us particularly vulnerable to our affluence. And those who are not affluent try harder. Our unacceptable health status, then, will not be improved appreciably by expanded medical resources nor by their redistribution so much as a general attempt to improve the quality of life for all.

Drug Labeling

Under existing law, a new drug may be labeled, promoted, and advertised only for those conditions in which safety and effectiveness have been demonstrated and of which the Food and Drug Administration (FDA) has approved, or so-called "approved uses". Other uses have come to be called "unapproved uses" and cannot be legally promoted. In a real sense, the term "unapproved" is a misnomer because it includes in one phrase two categories of marketed drugs that are very different: drugs which are potentially harmful and will never be approved, and already approved drugs that have "unapproved" uses. It is common for new research and new insights to demonstrate valid new uses for drugs already on the market. Also, there are numerous examples of medical progress resulting from the serendipitous observations and therapeutic innovations of physicians, both important methods of discovery in the field of therapeutics. Before such advances can result in new indications for inclusion in drug labeling, however, the available data must meet the legal standard of substantial evidence derived from adequate and

well-controlled clinical trials. Such evidence may require time to develop, and, without initiative on the part of the drug firm, it may not occur at all for certain uses. However, because medical literature on new uses exists and these uses are medically beneficial, physicians often use these drugs for such purposes prior to FDA review or changes in labeling. This is referred to as "unlabeled uses" of drugs.

A different problem arises when a particular use for a drug has been examined scientifically and has been found to be ineffective or unsafe, and yet physicians who either are uninformed or who refuse to accept the available scientific evidence continue to use the drug in this way. Such use may have been reviewed by the FDA and rejected, or, in some cases, the use may actually be warned against in the labeling. This subset of uses may be properly termed "disapproved uses".

Government policy should minimize the extent of unlabeled uses. If such uses are valid – and many are – it is important that scientifically sound evidence supporting them be generated and that the regulatory system accommodate them into drug labeling. Continuing rapid advances in medical care and the complexity of drug usage, however, makes it impossible for the government to keep drug labeling up to date for every conceivable situation. Thus, when a particular use of this type appears, it is also important, and in the interest of good medical care, that no stigma attached to "unapproved usage" by practitioners while the formal evidence is assembled between the time of discovery and the time the new use is included in the labeling. In the case of "disapproved uses", however, it is proper policy to warn against these in the package insert. Whether use of a drug for these purposes by the uninformed or intransigent physician constitutes a violation of the current Federal Food, Drug and Cosmetic Act is a matter of debate that involves a number of technical and legal issues. Regardless of that, the inclusion of disapproved uses in the form of contraindications, warnings and other precautionary statements in package inserts is an important practical deterrent to improper use. Except for clearly disapproved uses, however, it is in the best interests of patient care that physicians not be constrained by regulatory statutes from exercising their best judgment in prescribing a drug for both its approved uses and any unlabeled uses it may have.

Laughter and Health

Due to the involuntary, simultaneous contraction of 15 facial muscles, the upper lip is raised, partially uncovering the teeth and effecting a downward curving of the furrows that extend from the wings of both nostrils to the corners of the mouth. This produces a puffing out of the cheeks on the outer side of the furrows. Creases also occur under the eyes and may become permanent at the side edges of the eye. The eyes undergo reflex lacrimation and vascular engorgement. At the same time, an abrupt strong expiration of air is followed by spasmodic contractions of the chest and diaphragm resulting in a series of expiration-inspiration microcycles with interval pauses. The whole body may be thrown backward, shaken, or convulsed due to other spasmodic skeletal muscle contractions. We call this condition laughter.

Of all human expressive behaviors, laughter has proven a most fascinating enigma to philosophers and scientists alike. Its psychology, neurology, and anthropological origins and purpose are only partially defined. But its effects and uses are becoming increasingly apparent to health care professionals.

Laughter is considered to be an innate human response which develops during the first few weeks of life. Evidence of the innate quality of laughter is seen in its occurrence in deaf and blind infants and children who are completely without visual or auditory clues from their environment. Darwin propounded in his *Principle of Antithesis* that laughter develops as the infant's powerful reward signal of comfort and well-being to the nurturing adult. This signal is totally antithetical perceptually to the screams or cries of distress associated with discomfort. Laughter seems to play an important role in the promotion of social unity, production of a sense of well-being, communication of well-being, and as a mechanism for coping with stressful situations. Physiologically, both reflexive (tickle-response) and hear-felt (mental response) laughter effect changes to the human system which may be significant in the treatment and prevention of illness. These include laughter's association with an increase in pulse rate, probably due to increased levels of circulatory catecholamines (blood catecholamine levels vary directly with the intensity of laughter). There is an increase in respiration. There is a decrease in blood CO_2 levels. There is a possible increase in secretion of brain and pituitary endorphins – the body's natural anesthetics which relieve pain, inhibit emotional response to pain, and thus reduce suffering. There is a decrease in red blood cell sedimentation rate ("sed rate" is associated with the body's level of infection or inflammation).

While it is possible that the effect laughter and other salutary emotions have is primarily one of a placebo, this in no way minimizes the therapeutic potential for these emotions. Hippocrates propounded that the mind and body are one. It may be possible that there is a physical chemistry associated with the will to live. Further investigation of the effects of positive emotions upon health and well-being may give us the keys to unlocking the power of the life force.

Sleep

Experimental studies of sleep deprivation have been conducted for a number of years in an effort to determine the function of sleep. Theoretically, if sleep plays any biologically or psychologically essential role in the life of an organism, that role should become apparent when the organism has been systematically deprived of sleep. However, the results of the experiments that have been conducted are not clear-cut. In some experiments, subjects deprived of sleep for period of two hundred hours or more have been able to function on an almost normal level. The results of certain early studies, which seemed to suggest that psychotic-like symptoms, including hallucinations, loss of identity, and bizarre behavior, would routinely occur after a lengthy period of enforced sleeplessness, have not been confirmed. When these symptoms have occurred, it has generally been in subjects whose history revealed a predisposition to mental instability. In any case, the adverse effects of sleeplessness have been found to persist only rarely beyond a one or

two-day period of recovery sleep following the experimental vigil.

Certain relatively mild reactions to prolonged sleep deprivation do occur with some regularity. Hand tremors, slurred speech, and insensitivity to visual, aural, and tactile stimulation are common in sleep-deprived subjects. There is usually some loss of efficiency in the performance of tasks, although the nature and degree of the loss depends on the type of task imposed. Tasks for which the subject is able to set his or her own work pace are affected very slightly by sleep deprivation. On the other hand, when task itself imposes a particular work pace, accuracy and efficiency are likely to drop dramatically. Lengthy tasks requiring thirty minutes or more of continuous work are more adversely affected, as are tasks requiring alertness to fleeting sensory stimuli. Some theorists contend that the difficulties encountered with work-paced tasks by sleep-deprived persons can be explained by the phenomenon of "microsleep", momentary lapses into sleep by an otherwise wakeful individual. Microsleep episodes, while brief and often undetected by the subject, are thought to be likely to cause errors of omission in the performance of a task.

At the completion of an experimental vigil, most subjects engage in a twelve-to fourteen-hour period of sleep, after which most effects of the deprivation are gone. For the first two or three nights after the vigil, the usual pattern of sleep stages recorded by the electroencephalogram (EEG) is generally disrupted. The first recovery night includes a much greater amount than usual of stage-4 sleep (the deepest form of sleep), with correspondingly shorter periods of stage-1, stage-2, stage-3, and REM sleep. The second recovery night generally includes slightly more stage-4 sleep than usual, but more striking is the sharp increase in REM sleep, the type of sleep associated with dreaming. The marked rebound in REM sleep after a period of enforced wakefulness generally supports the notion that some minimum amount of dreaming is necessary for full psychological health, although it leaves obscure the question as to exactly how or why.

Anxiety Disorders

Observers studying anxiety, including Freud, long predicted that brain and central nervous system would be found to be functioning abnormally in patients with serious anxiety disorders. Their predictions remained speculative, however, because researchers were limited by the methods and knowledge of their times. Today, because of recent technological advances, much of the research being done on anxiety and related disorders focuses on the brain and nervous system. Some biological research workers attempt to understand anxiety disorders by experimentally producing anxiety in humans and other animals. Others study the physical symptoms commonly associated with phobias or panic to see whether they play a role in causing the disorders.

Research on neurotransmitters, the chemicals that carry messages from one nerve cell to another, has not found serious malfunctions associated with anxiety. But indirect measures suggest some abnormalities, particularly in the neurotransmitter norepinephrine. Scientists are, however, still far from being able to say whether brain malfunction – some genetic fault coded into the person's

hereditary apparatus, for example – is the cause of anxiety disorders.

Experts disagree about the meaning of some research findings. One problem they cite is that while studies focusing on the brain's processing of anxiety-reducing drugs suggest how the brain functions during episodes of severe anxiety, they prove nothing definitive. Another problem they cite is that most research has necessarily been confined to animals; whether the results apply to humans is not certain. Nevertheless, pieces of the neuroscientific puzzle have been found, and they are beginning to fall into place.

Investigators have identified several substances over the past few years that can actually produce panic attacks, though apparently only in people who have already experienced such attacks. This line of evidence suggests that patients subject to panic attacks may be biologically different from other people. It also offers clues to just what those differences might be. The ability to induce panic attacks gives research investigators a powerful tool for understanding them.

The most thoroughly studied of the anxiety-producing chemicals is sodium lactate. The use of this substance to induce panic attacks is based on the observation that some people who suffer extreme episodes of anxiety produce an excessive amount of the chemical lactate after routine exercise. For these people, exercise can actually set off a panic attack. Researchers have found that sodium lactate triggers panic attacks in a full 80 percent of patients with panic disorder, but in less than 20 percent of normal people. Lactate infusions may provide a means of suggesting which patients are biologically prone to panic attacks and thus apt to respond to drug treatment. It is unlikely, however, that lactate infusions will ever be a sure test.

Although less intensively studied, caffeine is another substance that can produce panic attacks in susceptible persons. About half of panic-disorder patients have panic experiences after consuming a quantity of caffeine equivalent to that contained in four or five cups of coffee. (Normal people also experience panic, but only after they ingest much larger quantities of caffeine.) Caffeine is thought to produce its effects by blocking the action of a brain chemical known as adenosine, a naturally occurring sedative. Clinical investigators have found that many people with panic attacks avoid caffeine after noticing that it causes attacks.

Memory and Emotion

Most of our knowledge about how the brain links memory and emotion has been gleaned through the study of so-called classical fear conditioning. In this process the subject, usually a rat, hears a noise or sees a flashing light that is paired with a brief, mild electric shock to its feet. After a few such experiences, the rat responds automatically to the sound or light even in the absence of the shock. Its reactions are typical to any threatening situation: the animal freezes, its blood pressure and heart rate increase, and it startles easily. In the language of such experiments, the noise or flash is a conditioned stimulus, the foot shock is an unconditioned stimulus, and the rat's reaction is a conditioned response, which consists of readily measured behavioral and

physiological changes.

Conditioning of this kind happens quickly in rats – indeed, it takes place as rapidly as it does in humans. A single pairing of the shock to the sound or sight can bring on the conditioned effect. Once established, the fearful reaction is relatively permanent. If the noise or light is administered many times without an accompanying electric shock, the rat's response diminishes. This change is called extinction. But considerable evidence suggests that this behavioral alteration is the result of the brain's controlling the fear response rather than the elimination of the emotional memory. For example, an apparently extinguished fear response can recover spontaneously or can be reinstated by an irrelevant stressful experience. Similarly, stress can cause the reappearance of phobias in people who have been successfully treated. This resurrection demonstrates that the emotional memory underlying the phobia was rendered dormant rather than erased by treatment.

Fear conditioning has proved an ideal starting point for studies of emotional memory for several reasons. First, it occurs in nearly every animal group in which it has been examined: fruit flies, snails, birds, lizards, fish, rabbits, rats, monkeys, and people. Although no one claims that the mechanisms are precisely the same in all these creatures, it seems clear from studies to date that the pathways are very similar in mammals and possibly in all vertebrates. We therefore are confident in believing that many of the findings in animals apply to humans. In addition, the kinds of stimuli most commonly used in this type of conditioning are not signals that rats – or humans, for that matter – encounter in their daily lives. The novelty and irrelevance of these lights and sounds help to ensure that the animals have not already developed strong emotional reactions to them. So researchers are clearly observing learning and memory at work. At the same time, such cues do not require complicated cognitive processing from the brain. Consequently, the stimuli permit us to study emotional mechanisms relatively directly. Finally, our extensive knowledge of the neural pathways involved in processing acoustic and visual information serves as an excellent starting point for examining the neurological foundations of fear elicited by such stimuli.

Blood Identification in Crime Detection

Methods for typing blood were developed around the turn of the century, about the same time that fingerprints were first used for identification. Only in the last decade or two, however, have scientists begun to believe that genetic markers in blood and other bodily fluids may someday prove as useful in crime detection as fingerprints.

The standard ABO blood typing has long been used as a form of negative identification. Added sophistication came with the discovery of additional subgroups of genetic markers in blood and with the discovery that genetic markers are present not only in blood but also in other bodily fluids, such as perspiration and saliva.

These discoveries were of little use in crime detection, however, because of the circumstances in which police scientists must work. Rather than a plentiful sample of blood freshly drawn from a patient, the crime laboratory is likely to receive only a tiny fleck of dried blood of unknown age from an unknown "donor" on a shirt or a scrap of rag that has spent hours or days exposed to air, high temperature, and other contaminants.

British scientists found a method for identifying genetic markers more precisely in small samples. In this process, called electrophoresis, a sample is placed on a tray containing a gel through which an electrical current is then passed. A trained analyst reads the resulting patterns in the gel to determine the presence of various chemical markers.

Electrophoresis made it possible to identify several thousand subgroups of blood types rather than the twelve known before. However, the equipment and special training required were expensive. In addition, the process could lead to the destruction of evidence. For example, repeated test of a blood-flecked shirt – one for each marker – led to increasing deterioration of the evidence and the cost of a week or more of laboratory time.

It remained for another British researcher, Brian Wrexall, to demonstrate that simultaneous analyses, using an inexpensive electrophoresis apparatus, could test for ten different genetic markers within a 24-hour period. This development made the study of blood and other fluid samples an even more valuable for crime detection.

In Vitro Culturing

Two techniques have recently been developed to simplify research and reduce the number of nonhuman primates needed in studies of certain complex hormonal reactions. One technique involves the culturing of primate pituitary cells and the cells of certain human tumors. In the other, animal oviduct tissue is transplanted under the skin of laboratory primates. Both culturing techniques complement existing methods of studying intact animals.

With an in vitro culturing technique, researchers are deciphering how biochemical agents regulate the secretion of prolactin, the pituitary hormone that promotes milk production. The cultured cells survive for as long as a month, and they do not require serum, a commonly used culture ingredient that can influence cellular function and confound study results. One primate pituitary gland may yield enough cells for as many as 72 culture dishes, which otherwise would require as many animals.

The other technique allows scientists to monitor cellular differentiation in the reproductive tracts of female monkeys. While falling short of the long-sought goal of developing an in vitro model of the female reproductive system, the next best alternative was achieved. The method involves transplanting oviduct tissue to an easily accessible site under the skin, where the grafted cells behave exactly as if they were in their normal environment. In about 80 percent of the grafts,

blood vessels in surrounding abdominal skin grow into and begin nourishing the oviduct tissue. Otherwise, the tissue is largely isolated, walled off by the surrounding skin. A cyst forms that shrinks and swells in tandem with stages of the menstrual cycle. With about 80 percent of the grafts reestablishing themselves in the new site, a single monkey may bear as many as 20 miniature oviducts that are easily accessible for study. Because samples are removed with a simple procedure requiring only local anesthesia, scientists can track changes in oviduct cell over short intervals. In contrast, repeated analysis of cellular changes within the oviduct itself would require abdominal surgery every time a sample was taken – a procedure that the animals could not tolerate.

Scientists are using the grating technique to study chlamydia infections, a leading cause of infertility among women. By infecting oviduct tissues transplanted into the abdominal skin of rhesus monkeys, researchers hope to determine how the bacteria cause pelvic inflammatory disease and lesions that obstruct the oviduct. Such research could eventually lead to the development of antibodies to the infectious agent and a strategy for producing a chlamydia vaccine.

Development and Human Immaturity

Man, so the truism goes, lives increasingly in a man-made environment. This places a special burden on human immaturity, for it is plain that adapting to such variable conditions must depend very heavily on opportunities for learning, or whatever the processes are that are operative during immaturity. It must also mean that during immaturity man must master knowledge and skills that are neither stored in the gene pool nor learned by direct encounter, but which are contained in the culture pool – knowledge about values and history, skills as varied as an obligatory natural language or an optional mathematical one, as mute as levers or as articulate as myth telling.

Yet, it would be a mistake to leap to the conclusion that because human immaturity makes possible high flexibility, therefore anything is possible for the species. Human traits were selected for their survival value over a four-to five-million-year period with a great acceleration of the selection process during the last half of that period. There were crucial, irreversible changes during that final man-making period: recession of formidable dentition, 50-percent increase in brain volume, the obstetrical paradox – bipedalism and strong pelvic girdle, larger brain through a smaller birth canal – immature brain at birth, and creation of what Washburn has called a "technical-social way of life", involving tool and symbol use.

Note, however, that hominidization consisted principally of adaptations to conditions in the Pleistocene. These preadaptations, shaped in response to earlier habitat demands, are part of man's evolutionary inheritance. This is not to say that close beneath the skin of man is a naked ape, that civilization is only a veneer. The technical-social way of life is a deep feature of the species adaptation, but we would err if we assumed a priori that man's inheritance placed no

constraint on his power to adapt. Some of the preadaptations can be shown to be presently maladaptive. Man's inordinate fondness for fats and sweets no longer serves his individual survival well. And the human obsession with sexuality is plainly not fitted for survival of the species now, however well it might have served to populate the upper Pliocene and the Pleistocene. Nevertheless, note that the species responds typically to these challenges by technical innovation rather than by morphological or behavioral change. Contraception dissociates sexuality from reproduction. We do not, of course, know what kinds and what range of stresses are produced by successive rounds of such technical innovation. Dissociating sexuality and reproduction, for example, surely produces changes in the structure of the family, which in turn redefine the role of women, which in turn alters the authority pattern affecting the child, etc. Continuing and possibly accelerating change seems inherent in such adaptation. And this, of course, places an enormous pressure on man's uses of immaturity, preparing the young for unforeseeable change – the more so if there are severe restraints imposed by human preadaptations to earlier conditions of life.

Human Immune System

The key to the human immune system is its ability to distinguish between self and nonself. Molecules that mark a cell as self are encoded by a group of genes contained in a section of a specific chromosome and are known as the major histocompatibility complex, or MHC. An antigen, which is any substance such as a virus, a bacterium, a fungus, or a parasite that is capable of triggering a response, announces its foreignness by means of intricate and characteristic shapes called epitopes, which protrude from its surface. Cells in the immune system are capable of recognizing an endless variety of distinguishable epitopes; the body will even reject nourishing proteins unless they are first broken down by the digestive system into their primary, nonantigenic building blocks. Tissues or cells from another individual, except an identical twin whose cells carry identical self-markers, also act as antigens. Because MHC genes and the molecules they encode vary widely in the details of their structure from one individual to another – a diversity known as polymorphism, transplants are very likely to be identified as foreign by the immune system and rejected.

Lungs

The lungs, shaped roughly like triangles or pyramids, rest in the chest cavity on the diaphragm (a muscular tissue that separates the abdominal cavity from the chest). They are separated by the large blood vessels, the esophagus, and the heart.

The main function of the lungs is to keep the body supplied with oxygen (lungs are unnecessary in water-dwelling animals as water removes the waste gases and supplies the cells with the needed oxygen). When oxygen enters the lungs, it permeates the walls of the air sacs and is

absorbed into the bloodstream. The blood travels through the body, giving oxygen to the tissues and receiving carbon dioxide.

The lungs, consisting primarily of air sacs, average between three and four pounds. Healthy lungs are gray and blotchy in appearance. The idea of the bright pink lung is widespread but erroneous. However, lungs do become grossly discolored by disease and smoking.

More than five hundred million alveoli (air sacs) are in the lungs. The alveoli are hollows formed by the bronchioles, which are the smallest version of the air passages known as the bronchial tubes. The alveoli are clusters (something like soap suds) that are found at the end of the bronchioles. The right lung has three lobes (large cluster of alveoli), while the left lung has two.

Skin

Because human anatomy does not change (except over long periods of time), knowledge acquired a century ago is still accurate today. Broad functions of any part of the body, such as the skin, are duplicated in different ways by other organs. One can eventually understand the entire body as a larger system made up of smaller, interdependent systems.

A cross-section of the skin reveals a top layer of epidermis, or cuticle, followed by derma, and finally, subcutaneous cellular tissue. Sprouting through all three layers are hairs, with hair follicles and erector pili muscles embedded deep within the subcutaneous tissue. Sweat (sudoriferous glands), fat cells, and sebaceous glands are scattered throughout, while papillae, which are conical and extremely sensitive, can be found directly beneath the superficial layer.

The skin is the primary organ of the sense of touch. It can excrete substances as well as absorb them, and it plays a vital role in regulating body temperature and in protecting the tissues that lie beneath it.

The epidermis has no veins or arteries and varies considerably both in thickness and in the depth or fineness of its furrows. On the palm, for example, the skin is quite thick, or horny, and is marked by deep furrows or lines. On the back of the hand, however, the skin is less thick, and has only a faint network of lines crisscrossing it. The pigment found in the epidermis gives whatever color there is to the skin; this pigment is similar to that found in the retina of the eye. One layer down, in the derma, there is similar variation in thickness, mostly to protect underlying tissue.

In the derma lies the vascular system, which includes nerves, blood vessels, and lymphatics. The derma is divided into two sub-layers: the reticular layer and the papillary layer, which is closer to the epidermis. The less sensitive the skin, the fewer papillae reside there; in the most sensitive places, such as the fingertips and the nipples, the papillae are long, large, and grouped closely together to form parallel arcs with ducts to sweat glands lying in between. Under the papillary

layer, and conforming to it, is the reticular layer, composed of fibrous bands and elastic tissue, and interlaced by fat and sudoriferous glands. The basic functions of muscular contraction, vascular transport, nerve communication, and protection all take place in the various layers of the skin, so that understanding the components of the skin and how they work together is a helpful step in understanding the complex anatomy of the human body.

Obesity

In terms of its prevalence, obesity is the leading disease in the United States. Obesity may be defined as a condition of excess adipose tissue, as fatness beyond cultural esthetic norms, or as adipose tissue tending to disrupt good health of mind and body. A common rule of thumb is that people more than 20 pounds above their desirable weights are obese. By this measure, 30 percent of men and 40 percent of women in America are obese. Despite the prevalence of the disease, curative measures are almost impossible for those currently obese; future generations may be spared.

Adipose tissue is triumph of evolution. Fat yields 9.0 calories per gram, while carbohydrates and protein each 4.0 calories per gram, and fat contains much less water than does protein. It is, therefore, much more efficient to store excess energy as fat than as protein. Primitive man, with uncertain food sources, had great need for excess fat, but modern Western man, with predictable food supply and sedentary lifestyle, is burdened by this evolutionary vestige. This is not to say that modern man has no need at all for adipose tissue; on the contrary, he needs it if for such important purposes as insulation from cold, and protection of organs from injury.

The problem Americans face is losing excess adipose tissue, and they turn from one fad diet to another. Despite a billion-dollar diet industry, the five-year cure rate of obesity is almost zero. Cancer is more curable. The reasons for this are psychological as well as physiological.

From a physical standpoint, losing a pound or two a week for a few weeks is not difficult, for most of the loss is in the form of protein and water, and protein carries with it four times its weight in water. However, when the body has been in negative nitrogen balance for too long, it acts to correct the situation by taking in as much or more nitrogen than it excretes. Since protein is the only source of nitrogen in the diet, any future weight loss must come from adipose tissue, the very compactness of which makes losing weight a very slow and tedious task. If caloric expenditure exceeds intake by 500 calories, only 62 grams of adipose tissue can be lost as compared with 620 grams of protein and associated water. The body's tendency to return to nitrogen balance can be so strong that the dieter may actually gain weight while still expending more calories than he is ingesting. Faced with a discontinuance of weight loss, or even a weight gain, while still adhering to a previously successful diet tends to lead dieters to suffer depression, hunger, decreased metabolic rate, inactivity, and weakness, which in turn lead to the diet's abandonment. The strong tendency then is for rapid weight gain, probably from numerous psychological factors as well as such physiological ones as increased lipid synthesis.

Obese people tend to be hypertensive, diabetic, and, because they are relatively insensitive to insulin's effects, hyperinsulinemic. Weight loss is associated with improvement in all these categories. Further, obesity is correlated with increased serum lipids (such as cholesterol), a condition which is additionally significant because of its role in atherosclerotic heart disease, by far the leading cause of death in the United States.

While vigorous attempts to reduce obesity in America should be aimed at all affected, the most successful efforts are likely to be those directed toward children. If the advertising and food industries stop trying to sell high-caloric, low-nutritive-value foods to children, if parents reserve sweets as treats for special occasions, and if mothers and fathers are successfully educated to understand that the feeding patterns they impose on their infants and children can determine the adolescent and adult eating habits those children will develop, the future generation may not be as fat as ours is.

Treatment of Myocardial Injury

Nitroglycerin has long been famous for its relief of angina pectoris attacks but ruled out for heart attacks on the theory that it harmfully lowers blood pressure and increases heart rate. A heart attack, unlike an angina attack, always involves some localized, fairly rapid heart muscle death, or myocardial infarction. This acute emergency happens when the arteriosclerotic occlusive process in one of coronary arterial branches culminates so suddenly and completely that the local myocardium – the muscle area that was fed by the occluded coronary – stops contracting and dies over a period of hours, to be replaced over a period of weeks by a scar, or "healed infarct".

In 1974, in experiments with dogs, it was discovered that administration of nitroglycerin during the acute stage of myocardial injury, provided that the dog's heart rate and blood pressure were maintained in the normal range. Soon after, scientists made a preliminary confirmation of the clinical applicability of nitroglycerin in acute heart attack in human patients. Five of twelve human subjects developed some degree of congestive heart failure. Curiously, the nitroglycerin alone was enough to reduce the magnitude of injury in these five patients, but the other seven patients, whose heart attacks were not complicated by any congestive heart failure, were not consistently helped by the nitroglycerin until another drug, phenylephrine, was added to abolish the nitroglycerin-induced drop in blood pressure. One explanation for this is that the reflex responses in heart rate, mediated through the autonomic nervous system, are so blunted in congestive heart failure that a fall in blood pressure prompts less of the cardiac acceleration which otherwise worsens the damage of acute myocardial infarction.

It appears that the size of the infarct that would otherwise result from a coronary occlusion might be greatly reduced, and vitally needed heart muscle thus saved, by the actions of certain drugs and other measures taken during the acute phase of the heart attack. This is because the size of the myocardial infarct is not really determined at the moment of the coronary occlusion as

previously thought. The fate of the stricken myocardial segment remains largely undetermined, hanging on the balance of myocardial oxygen supply and demand which can be favorably influenced for many hours after the coronary occlusion. So it is possible to reduce the myocardial ischemic injury during acute human heart attacks by means of nitroglycerin, either alone or in combination with phenylephrine.

Other drugs are also being tested to reduce myocardial infarct size, particularly drugs presumed to affect myocardial oxygen supply and demand, including not only vessel dilators such as nitroglycerin but also antihypertensives, which block the sympathetic nerve reflexes that increase heart rate and work in response to exertion and stress. Such measures are still experimental, and there is no proof of benefit with regard to the great complications of heart attack such as cardiogenic shock, angina, or mortality. But the drugs for reducing infarct size now hold center stage in experimental frameworks.

Preventive Medicine and Curative Medicine

According to legend, Aesculapius bore two daughters, Panacea and Hyegeia, who gave rise to dynasties of healers and hygienists. The schism remains today, in clinical training and in practice; and because of the imperative nature of medical care and the subtlety of health care, the former has tended to dominate. Preventive medicine has as its primary objective the maintenance and promotion of health. It accomplishes this by controlling or manipulating environmental factors that affect health and disease. For example, in California presently there is serious suffering and substantial economic loss because of the failure to introduce controlled fluoridation of public water supplies. Additionally, preventive medicine applies prophylactic measures against disease by such actions as immunization and specific nutritional measures. Third, it attempts to motivate people to adopt healthful life-styles through education.

For the most part, curative medicine has as its primary objective the removal of disease from the patient. It provides diagnostic techniques to identify the presence and nature of the disease process. While these may be applied on a mass basis in an attempt to "screen" out persons with preclinical disease, they are usually applied after the patient appears with a complaint. Second, it applies treatment to the sick patient. In every case, this is, or should be, individualized according to the particular need of each patient. Third, it utilizes rehabilitation methodologies to return the treated patient to the best possible level of functioning.

While it is true that both preventive medicine and curative medicine require cadres of similarly trained personnel such as planners, administrators, and educators, the underlying delivery systems depend on quite distinctive professional personnel. The requirements for curative medicine call for clinically trained individuals who deal with patients on a one-to-one basis and whose training is based primarily on an understanding of the biological, pathological, and psychological processes that determine an individual's health and disease status. The locus for this training is the laboratory and clinic. Preventive medicine, on the other hand, calls for a very

broad of professional personnel, few of whom require clinical expertise. Since their actions apply either to environmental situations or to population groups, their training takes place in a different type of laboratory or in a community not necessarily associated with the clinical locus.

The economic differences between preventive medicine and curative medicine have been extensively discussed, perhaps most convincingly by Winslow in the monograph. *The Cost of Sickness and the Price of Health*. The sickness is almost always a negative, nonproductive and harmful state. All resources expended to deal with sickness are therefore fundamentally economically unproductive. Health, on the other hand, has a very high value in our culture. To the extent that healthy members of the population are replaced by sick members, the economy is doubly burdened. Nevertheless, the per capita cost of preventive measures for specific diseases is generally far lower than the per capita cost of curative medicine applied to treatment of the same disease. Prominent examples are dental caries, poliomyelitis and phenylketonuria.

There is an imperative need to provide care for the sick person within a single medical care system, but there is no overriding reason why a linkage is necessary between the two components of a health care system, prevention and treatment. A national health and medical care program composed of semiautonomous systems for personal health care and medical care would have the advantage of clarifying objectives and strategies and of permitting a more equitable division of resources between prevention and cure.

Hypertension

Although it is now possible to bring most high blood pressure under control, the cause of essential hypertension remains elusive. Understanding how hypertension begins is at least partly a problem of understanding when in life it begins, and this may be very early – perhaps within the first few months of life. Since the beginning of the century, physicians have been aware that hypertension may run in families, but before the 1970's, studies of the familial aggregation of blood pressure treated only populations 15 years of age or older. Few studies were attempted in younger persons because of a prevailing notion that blood pressures in this age group were difficult to measure and unreliable and because essential hypertension was widely regarded as a disease of adults.

In 1971, a study of 700 children, age 2 to 14, used a special blood pressure recorder which minimizes observer error and allows for standardization of blood pressure readings. Before then, it had been well established that the blood pressure of adults aggregates familiarly, that is, the similarities between the blood pressure of an individual and his siblings are generally too great to be explained by chance. The 1971 study showed that familial clustering was measurable in children as well, suggesting that factors responsible for essential hypertension are acquired in childhood. Additional epidemiological studies demonstrated a clear tendency for the children to retain the same blood pressure patterns, relative to their peers, four years later. Thus, a child with blood pressure higher or lower than the norm would tend to remain higher or lower with

increasing age.

Meanwhile, other investigators uncovered a complex of physiologic roles – including blood pressure – for a vasoactive system called the kallikrein-kinin system. Kallikreins are enzymes in the kidney and blood plasma which act on precursors called kininogens to produce vasoactive peptides called kinins. Several different kinins are produced, at least three of which are powerful blood vessel dilators. Apparently, the kallikrein-kinin system normally tends to offset the elevations in arterial pressure that result from the secretion of salt-conserving hormones such as aldosterone on the one hand and from activation of the sympathetic nervous system (which tends to constrict blood vessels) on the other hand.

It is also known that urinary kallikrein excretion is abnormally low in subjects with essential hypertension. Levels of urinary kallikrein in children are inversely related to the diastolic blood pressures of both children and their mothers. Children with the lowest kallikrein levels are found in the families with the highest blood pressures. In addition, black children tend to show somewhat lower urinary kallikrein levels than white children, and blacks are more likely to have high blood pressure. There is a great deal to be learned about the biochemistry and physiologic roles of the kallikrein-kinin system. But there is the possibility that essential hypertension will prove to have biochemical precursors.

Asbestos

In Aachen, Germany, and environs, many children have been found to have an unusually high lead content in their blood and hair. The amount of lead in the children tested has risen above the amount found in workers in heavy-metal industries. The general public is no longer surprised that the lead has been traced to Stolberg near Aachen: Stolberg is surrounded by brass foundries and slag heaps which supply building materials to construct schoolyards and sports halls.

This is but one example ...

When Dr. John W. Gofman, professor of medical physics at the University of California and a leading nuclear critic, speaks of "ecocide" in his adversary view of nuclear technology, he means the following: A large nuclear plant like that in Kalkar, the Netherland, would produce about 200 pounds of plutonium each year. One pound, released into the atmosphere, could cause 9 billion cases of lung cancer. This waste product must be stored for 500,000 years before it is of no further danger to man. In the anticipated reactor economy, it is estimated that there will be 10,000 tons of this material in western Europe, of which one tablespoonful of plutonium-239 represents the official maximum permissible body burden for 200,000 people. Rather than being biodegradable, plutonium destroys biological properties.

In 1972 the U.S. Occupational Safety and Health Administration ruled that the asbestos level in the work place should be lowered to 2 fibers per cubic centimeter of air, but the effective date of

the ruling has been delayed until now. The International Federation of Chemical and General Worker's Unions report that the 2-fiber standard was based primarily on one study of 290 men at British asbestos factory. But when the workers at the British factory had been reexamined by another physician, 40-70 percent had x-ray evidence of lung abnormalities. According to present medical information at the factory in question, out of a total of 29 deaths thus far, seven were caused by lung cancer and three by mesothelioma, a cancer of the lining of the chest-abdomen. An average European or American worker comes into contact with six million fibers a day. And when this man returns home at night, samples of this fireproof product are on his clothes, in his hair, in his lunchpail. "We are now, in fact, finding cancer deaths within the family of the asbestos worker", states Dr. Lrving Selikoff, of the Mount Sinai Medical School in New York.

It is now also clear that vinyl chloride, a gas from which the most widely used plastics are made, causes a fatal cancer of the blood-vessel cells of the liver. However, the history of the research on vinyl chloride is, in some ways, more disturbing than the "Watergate cover-up". "There has been evidence of potentially serious disease among polyvinyl chloride workers for 25 years that has been incompletely appreciated and inadequately approached by medical scientists and by regulatory authorities", summed up Dr. Selikoff in the *New Scientist*. At least 17 workers have been killed by vinyl chloride because research over the past 25 years was not followed up. And for 10 years, workers have been exposed to concentrations of vinyl chloride 10 times the "safe limit" imposed by Dow Chemical Company. In the United Kingdom, a threshold limit value was set after the discovery of the causal link with osteolysis, but the limit was still higher than that set by Dow Chemical. The Germans set a new maximum level in 1970, but also higher than that set by Dow. No other section of U.S. or European industry has followed Dow's lead.

第三部分　　文学、艺术

Literature

In the collected body of writing we call literature, there may be distinguished two separate groupings, capable of blending, but also fitted for reciprocal repulsion. There is first the literature of knowledge, and secondly the literature of power. The function of the first is to teach; the function of the second is to move. The first is a rudder, the second an oar or sail. The first speaks to the mere discursive understanding; the second speaks ultimately to the higher understanding or reason, but always through the affections of pleasure and sympathy. Whenever we talk in ordinary language of seeking information or gaining knowledge, we understand the words as connected with absolute novelty. But it is the grandeur of all truth which can occupy a very high place in human interests, although it may not be absolutely novel even to the meanest of minds.

What do we learn from *Paradise Lost*? Nothing at all. What do we learn from a cookbook? Something new, something we did not know before, in every paragraph. But would we therefore put the wretched cookbook on a higher level of estimation than the divine poem? What we owe to Milton is not any knowledge, of which a million separate items are still but a million advancing steps on the same earthly level; what we owe is power, that is, exercise and expansion of your own latent capacity of sympathy with the infinite, where every pulse and each separate influx is a step upwards – a step ascending as upon Jacob's ladder from earth to mysterious altitudes above the earth. All the steps of knowledge, from first to last, carry us farther on the same plane, but could never raise us one foot above your ancient level on earth; whereas, the very first step of power is flight – an ascending into another element where earth is forgotten.

Literature and Business

Literature is at once the most intimate and the most articulate of the arts. It cannot impart its effect through the senses or the nerves as the other arts can; it is beautiful only through the intelligence; it is the mind speaking to the mind; until it has been put into absolute terms, of an invariable significance, it does not exist at all. It cannot awaken this emotion in one, and that in another; if it fails to express precisely the meaning of the author, if it does not say *him*, it says nothing, and is nothing. So that when a poet has put his heart, much or little, into a poem, and sold it to a magazine, the scandal is greater than when a painter has sold a picture to a patron, or a sculptor has modeled a statue to order. These are artists less articulate and less intimate than the poet; they are more exterior to their work; they are less personally in it; they part with less of themselves in the dicker. It does not change the nature of the case to say that Tennyson and Longfellow and Emerson sold the poems in which they couched the most mystical messages their genius was charged to bear mankind. They submitted to the conditions which none can

escape; but that does not justify the conditions, which are none the less the conditions of hucksters because they are imposed upon poets. If it will serve to make my meaning a little clearer, we will suppose that a poet has been crossed in love, or has suffered some real sorrow, like the loss of a wife or child. He pours out his broken heart in verse that shall bring tears of sacred sympathy from his readers, and an editor pays him a hundred dollars for the right of bringing his verse to their notice. It is perfectly true that the poem was not written for these dollars, but it is perfectly true that it was sold for them. The poet must use his emotions to pay his provision bills; he has no other means; society does not propose to pay his bills for him. Yet, and at the end of the ends, the unsophisticated witness finds the transaction ridiculous, finds it repulsive, finds it shabby. Somehow he knows that if our huckstering civilization did not at every moment violate the eternal fitness of things, the poet's song would have been given to the world, and the poet would have been cared for by the whole human brotherhood, as any man should be who does the duty that every man owes it.

The instinctive sense of the dishonor which money-purchase does to art is so strong that sometimes a man of letters who can pay his way otherwise refuses pay for his work, as Lord Byron did, for a while, from a noble pride, and as Count Tolstoy has tried to do, from a noble conscience. But Byron's publisher profited by a generosity which did not reach his readers; and the Countess Tolstoy collects the copyright which her husband foregoes; so that these two eminent instances of protest against business in literature may be said not to have shaken its money basis. I know of no others; but there may be many that I am culpably ignorant of. Still, I doubt if there are enough to affect the fact that Literature is Business as well as Art, and almost as soon. At present business is the only human solidarity; we are all bound together with that chain, whatever interests and tastes and principles separate us.

Classic Literature

The large majority of our fellow citizens care as much about literature as they care about archaeology or the program of the legislature. They do not entirely ignore it; they are not quite indifferent to it. But their interest in it is faint and perfunctory; or, if their interest happens to be intense, it is spasmodic. Ask the two hundred thousand persons whose enthusiasm made the vogue of a popular novel ten years ago what they think of that novel now, and you will gather that they have utterly forgotten it.

In the face of this, one may ask: Why does the great and universal fame of classic authors continue? The answer is that the fame of classic authors is entirely independent of the majority. Do you suppose that if the fame of Shakespeare depended on the man in the street it would survive for a fortnight? The fame of classic authors is originally made, and it is maintained, by a passionate few.

Even on those rare occasions when a first-class author has enjoyed immense success during his lifetime, the majority have never appreciated him so sincerely as they have appreciated

second-rate writers. The first-class author has always been reinforced by the ardor of the passionate few. And in the case of an author who emerged into glory after his death, this has been due solely to the obstinate perseverance of the few. They kept on savoring him, and talking about him, and buying him, and they generally behaved with such eager zeal, and they were so authoritative and sure of themselves, that at last the majority grew accustomed to the sound of his name and placidly agreed to proposition that he was a genius. The majority really did not care very much either way.

What causes the passionate few to make such a fuss about literature? There can be only one reply. They find a keen and lasting pleasure in it. They enjoy literature as some people enjoy beer. And what are the qualities of a book which give keen and lasting pleasure to the passionate few? This is a question so difficult that it has never yet been completely answered. You may talk lightly about truth, insight, knowledge, wisdom, humor, and beauty, but these comfortable words do not really carry you very far, for each of them has to be defined, especially the first and last. It is all very well for Keats in his airy manner to assert that beauty is truth, truth is beauty, and that is all he knows or needs to know. I, for one, need to know a lot more. And I shall never know. Nobody, not even a great critic like Hazily or Sainte-Beuve, has ever finally explained why he thought a book beautiful.

A classic is a work which gives pleasure to the minority which is intensely and permanently interested in literature. It lives on because the minority, eager to renew the sensation of pleasure, is eternally curious and is therefore engaged in an eternal process of rediscovery. A classic does not survive for any ethical reason. It does not survive because it conforms to certain canons or rules. It survives because it is a source of pleasure.

Importance of Literature

In reaction to a rigid, overrefined classical curriculum, some educational philosophers have swung sharply to an espousal of "life experience" as the sole source of learning. Using their narrow interpretation of John Dewey's theories for support and spouting such phrases as "Teach the child, not the subject", they demand an end to rigorous study and insist that only through doing can learning take place. While not all adherents to this philosophy would totally eliminate the study of great books, the gradual subordination of literature in the school curriculum reflects their influence.

What is the purpose of literature? Why read if life alone is to be our teacher? James Joyce tells us that the artist reveals the human condition by re-creating life out of life; Aristotle, that art presents universal truths because its form is taken from nature. Thus, consciously or otherwise, great writers extend our understanding of ourselves and our world. We can soar with them to the heights of aspiration or plummet with them to the depths of despair. How much wider is the understanding we gain from reading than from viewing life through the keyhole of our individual experience.

This function of literature, the enlarging of our life sphere, is of major importance in itself. Additionally, however, literature suggests solutions to social problems. The overweening ambitions of political leaders – and their sneering contempt for the law – did not appear for the first time in the writings of Bernstein and Woodward. The problems and behavior of the guilt-ridden did not await the appearance of the bearded psychoanalysts of the nineteenth century.

Federal Judge Learned Hand wrote, "I venture to believe that it is as important to a judge called upon to pass on a question of constitutional law, to have at least a bowing acquaintance with Thucydides, Gibbon, and Carlyle, with Homer, Dante, Shakespeare, and Milton, with Montaigne and Rabelais, with Plato, Bacon, Hume, and Kant, as with the books which have been specifically written on the subject. For in such matters everything turns upon the spirit in which he approaches the questions before him."

How do we overcome our dissenters? We must start with the field of agreement: the belief that education should serve to improve the individual and society. We must persuade our dissenters that the voices of human experience stretch our human faculties and open us to learning. We must convince them of the unity of life and art. We much prove to them that far from being separate, literature is that part of life that illumines life.

Literature in the Twenties

Literary periods are slippery concepts. When dates are established and cultural developments are outlined, predecessors and successors have a way of making them dissolve. One discovers that the Romantic Period in English literature so comfortably introduced as extending from 1800 to 1830 has long Pre-Romantic development and that it really isn't over yet. The same thing is true of American literary history, perhaps more so. But if there is one date that seems to make a decisive cut in the continuity of twentieth-century America, it is probably the stock market crash at the end of October 1929. By 1930 reassessment was forced on the American consciousness.

The Twenties have a character of their own, an individualized and particularized decade for which there has come to be felt considerable nostalgia among the older generation. Clear memories can hardly regard these years as the good old days (this was the era of prohibition and gangsters), but one of the blessings of the human condition is the tendency to forget unpleasantness and remember what one chooses to remember. Perhaps even the Sixties will become a happy recollection in the twenty-first century.

Three major designations arose in the Twenties to define the Twenties as a cultural phenomenon: the Jazz Age, the Lost Generation, and the Wasteland – all with significant literary associations. Of them all the Jazz Age, as represented best in F. Scott Fitzgerald's fiction, was most clearly cut off by the stock market collapse and the ensuing depression. It is the period of the Twenties alone.

But the Lost Generation (as proclaimed in the double epigraph from Ecclesiastes and Gertrude Stein in the 1926 *The Sun Also Rises* – "You are all a lost generation." – Gertrude Stein in conversation) continued to be lost in the Thirties. The uprootedness and disillusionment of the post-World War I fiction writers, many of whom had participated in that war and perhaps particularly of the Paris expatriate group including Hemingway, Elliot Paul, Henry Miller, and others, pursued them into the depression and beyond. The third term, the Wasteland, established by T.S. Eliot in his 1922 poem, had perhaps an even longer life; it has come to represent an age extending from the Twenties to 1945 and may indeed suggest the central features of the landscape of this larger period. The Wasteland poets, including Ezra Pound, Eliot himself, and possibly William Carlos Williams, Archibald MacLeish, and E.E. Cummings, although many of them had written distinctive poetry even before 1920 and certainly before 1930, continued to develop and sharpen both their verse and their ideas into the Thirties and Forties. The Wasteland runs into and disappears in the Age of Anxiety. Such American writers as Gertrude Stein, Ezra Pound, T.S. Eliot, Williams, Cummings, and Hemingway are included in the post-1930 Canon rather than in the pre-1930 one. They had all certainly made a mark in the literary world before 1930, but they were ahead of their time and made a larger and deeper mark after that date.

Naturalism

Naturalism differs from realism in several aspects, none of which is clear-cut and definitive. It tends to be more doctrinaire in its exposition of pseudoscientific principles, it is less interested in character and more in the conflict of social forces, and it is concerned to a greater extent with the sordid, the shocking, and the depressing sides of existence. By these criteria, however, there are naturalistic elements in Dostoevsky; and Galsworthy, Hemingway, and Scott Fitzgerald demonstrate many qualities of typical realists. Some further suggested qualities of literary naturalism are as follows:

(a) Naturalism is scientific or pseudoscientific in its approach; it attempts to treat human beings as biological pawns rather than agents of free will. The author does not attempt to judge his characters or to comment on their actions; he merely inserts them into a crucial situation and then pretends to stand back and watch them with the impassivity of the scientists. Although Zola applied this principle with some success, it has generally remained a synthetic theory and has only infrequently been applied to actual literary works.

(b) The naturalist attempts to make literature into a document of society. He writes "novel cycles" purporting to cover every aspect of modern life, or creates characters who are personifications of various social classes. Many naturalists gather copious data from actual life and include it in their literary works: they write novels around specific occupations such as railroading or textile manufacturing in which they utilize technical details of the trade for story-interest. This aspect of naturalism represents an attempt to remove literature from the realm of the fine arts into the field of the social sciences.

(c) Because of the above-described documentary nature of naturalism, the technique often involves the conscious suppression of the poetic elements in literature. The prose style is flat, objective, and bare of imagery; it includes copious details and explanations, and is wary of highly literary metaphors. Like the pseudoscientific dogma described in (a) above, this quality is often more theoretical than practical. The best naturalists are those who do not totally abandon the literary traditions of the past. On the other hand some naturalists are merely writers lacking in the poetic instinct; they avoid a highly literary prose because they have little feeling for style and imagery. Others like Hardy are essentially poets who achieve highly poetic effects in their prose.

(d) Naturalistic literature tends to be concerned with the less elegant aspects of life; its typical settings are the slum, the sweatshop, the factory, or the farm. Where the romantic author selects the most pleasant and idealistic elements in his experience, the naturalistic author often seems positively drawn toward the brutal, the sordid, the cruel, and the degraded. This tendency is in part a reaction against earlier literature, especially against the sentimentalism of the Dumas school where vice is invariably made to appear romantic. The real motivating forces in a naturalistic novel are not religion, hope, or human idealism; they are alcohol, filth, disease, and the human instinct toward bestiality. It will be seen immediately that there are important exceptions to this principle. Galsworthy's scenes are middle-class, and Scott Fitzgerald prefers to do his slumming at the Ritz.

Satire

Satire attained a dominating position between 1660 and 1730 that it had not had before. As an oblique expression of the writer's wish to reform society, or as the somewhat baser tool of his scorn and ridicule, Restoration satire had diverse outlets. Political parties, religious sects, and fashionable philosophies were as much the delights of satirists as were topical gossip and assorted fops, pedants, and bigots.

Pope's mock heroic epic, *The Rape of the Lock*, probes the excesses of romantic etiquette: Lady Belinda's tresses are cropped by a suitor while she lingers over her coffee. According to Samuel Johnson, such an incident was a questionable topic for poetic treatment: "The subject of the poem is an event below the common incidents of common life ..." Yet the frivolous subject matter provides the ideal setting for a gentle lambasting of traditional epic machinery and a delicate exposure of the romantic conventions of the day.

Musical Novels

Literary critics are fond of referring to a work as a "musical novel" whenever a writer employs techniques that can be conveniently described in musical terminology, but the notion that all such works are of the same genre is an oversimplification. In *The Waves*, Virginia Woolf uses musical

techniques to evoke imagery. In *Moderato Cantabile*, Marguerite Duras follows the form of the first movement of a sonata. When most literary critics pronounce both *The Waves* and *Moderato Cantabile* "musical novels", it is these gross features that they have in mind; and so they overlook what makes *Moderato Cantabile* a truly musical novel: It is actually "heard" by the reader. The novel is mostly dialogue punctuated by the sounds of a radio, boats, and crowds, like musical phrases defined by rests; all that we know and all that we need to know of Anne and Chauvin is what we hear them say. Ironically, this technique that makes *Moderato Cantabile* more successful than *The Waves* as a "musical novel" may account for Duras' relative lack of success as a filmmaker. Despite the great success of her screenplay for "Hiroshima, Mon Amour", few of the 19 films that she wrote and directed did well, primarily because words often replaced action entirely.

Black Writers

There can be no doubt that the emergence of the Negro writer in the post-war period stemmed, in part, from the fact that he was inclined to exploit the opportunity to write about himself. It was more than that, however. The movement that has variously been called the "Harlem Renaissance", the "Black Renaissance", and the "New Negro Movement" was essentially a part of the growing interest of American literary circles in the immediate and pressing social and economic problems. This growing interest coincided with two developments in Negro life that fostered the growth of the New Negro Movement. These two factors, the keener realization of injustice and the improvement of the capacity for expression, produced a crop of Negro writers who constituted the "Harlem Renaissance".

The literature of the Harlem Renaissance was, for the most part, the work of a race-conscious group. Through poetry, prose, and song, the writers cried out against social and economic wrongs. They protested against segregation and lynching. They demanded higher wages, shorter hours, and better conditions of work. They stood for full social equality and first-class citizenship. The new vision of social and economic freedom which they had did not force them to embrace the several foreign ideologies that sought to sink their roots in some American groups during the period.

The writers of the Harlem Renaissance, bitter and cynical as some of them were, gave little attention to the propaganda of the socialists and communists. The editor of the *Messenger* ventured the opinion that the New Negro was the "product of the same world-wide forces that have brought into being the great liberal and radical movements that are now seizing the reins of power in all the civilized countries of the world." Such forces may have produced the New Negro, but the more articulate of the group did not resort to advocating the type of political action that would have subverted American constitutional government. Indeed, the writers of the Harlem Renaissance were not so much revolting against the system as they were protesting its inefficient operation. In this approach they proved as characteristically American as any writers of the period. Like his contemporaries, the Negro writer was merely becoming more aware of

America's pressing problems; and like the others, he was willing to use his art, not only to contribute to the great body of American culture but to improve the culture of which he was a part.

It seems possible, moreover, for the historian to assign to the Negro writer a role that he did not assume. There were doubtless many who were not immediately concerned with the injustices heaped on the Negro. Some contrived their poems, novels, and songs merely for the sake of art, while others took up their pens to escape the sordid aspects of their existence. If there is an element of race in their writings, it is because the writings flow out of their individual and group experiences. This is not to say that such writings were not effective as protest literature, but rather that not all the authors were conscious crusaders for a better world. As a matter of fact, it was this detachment, this objectivity, that made it possible for many of the writers of the Harlem Renaissance to achieve a nobility of expression and a poignancy of feeling in their writings that placed them among the masters of recent American literature.

Women Writers

As the works of dozens of women writers have been rescued from what E.P. Thompson calls "the enormous condescension of posterity", and considered in relation to each other, the lost continent of the female tradition has risen like Atlantis from the sea of English literature. It is now becoming clear that, contrary to Mill's theory, women have had a literature of their own all along. The woman novelist, according to Vineta Colby, was "really neither single nor anomalous", but she was also more than a "register and spokesman for her age". She was part of a tradition that had its origins before her age, and has carried on through our own.

Many literary historians have begun to reinterpret and revise the study of women writers. Ellen Moers sees women's literature as an international movement, "apart from, but hardly subordinate to the mainstream: an undercurrent, rapid and powerful. This 'movement' began in the late eighteenth century, was multinational, and produced some of the greatest literary works of two centuries, as well as most of the lucrative pot-boilers." Patricia Meyer Spacks, in *The Female Imagination*, finds that "for readily discernible historical reasons women have characteristically concerned themselves with matters more or less peripheral to male concerns, or at least slightly skewed from them. The differences between traditional female preoccupations and roles and male ones make a difference in female writing". Many other critics are beginning to agree that when we look at women writers collectively we can see an imaginative continuum, the recurrence of certain patterns, themes, problems, and images from generation to generation.

This book is an effort to describe the female literary tradition in the English novel from the generation of the Brontes to the present day, and to show how the development of this tradition is similar to the development of any literary subculture. Women have generally been regarded as "sociological chameleons", taking on the class, lifestyle, and culture of their male relatives. It can, however, be argued that women themselves have constituted a subculture within the framework

of a larger society, and have been unified by values, conventions, experiences, and behaviors impinging on each individual. It is important to see the female literary tradition in these broad terms, in relation to the wider evolution of women's self-awareness and to the ways any minority group finds its direction of self-expression relative to a dominant society, because we cannot show a pattern of deliberate progress and accumulation. It is true, as Ellen Moers writes, that "women studied with a special closeness the works written by their own sex"; in terms of influences, borrowings, and affinities, the tradition is strongly marked. But it is also full of holes and hiatuses, because of what Germaine Greer calls the "phenomenon of the transience of female literary fame"; almost uninterruptedly since the Interregnum, a small group of women have enjoyed dazzling literary prestige during their own lifetimes; only to vanish without trace from the records of posterity. Thus each generation of women writers has found itself, in a sense, without a history, forced to rediscover the past anew, forging again and again the consciousness of their sex. Given this perpetual disruption, and also the self-hatred that has alienated women writers from a sense of collective identity, it does not seem possible to speak of a movement.

Americans' Self-confidence

Nearly every foreign traveler who visited the United States during the first decade of the nineteenth century carried away an impression sober if not sad. A thousand miles of desolate and dreary forest, broken here and there by settlements; along the seacoast a few flourishing towns devoted to commerce; no arts, a provincial literature, the evil of slavery, and political differences fortified within geographical lines – what could be hoped for such a country?

Ages must probably pass before the interior of the country could be thoroughly settled. Even President Thomas Jefferson, usually an optimist, talked resignedly of a thousand years, and in his first Inaugural Address, at a time when the Mississippi River formed the western boundary of the nation, spoke of the country as having "room enough for our descendants to the hundredth and thousandth generation". No prudent person dared to act on the assumption that, when the continent was settled, one government could include the whole; and when the vast expanse broke up, as seemed inevitable, into a collection of separate nations, only discord, antagonism, and wars could be expected.

The mass of Americans are sanguine and self-confident partly by temperament, but partly also by reason of ignorance; for they knew little of the difficulties which beset a complex society. The Duc de Liancourt, like many critics, was struck by this trait. Among other examples, he met with one in the person of Pennsylvania miller, Thomas Lea, "a sound American patriot, believing that nothing good is done, and that no one has any brains, except in America; that the wit, the imagination, the genius of Europe are in decline"; and the duke added, "This error is to be found in almost all Americans – legislators and administrators, as well as millers – and is less innocent there."

In the year 1796 the House of Representatives had considered inserting in their Reply to the

President's Speech a remark that the nation was "the freest and most enlightened in the world" – a nation as yet in its infancy, with neither literature, arts, sciences, nor history. The moment was particularly ill chosen for such a claim, because Europe was on the verge of an outbreak of genius. Goethe and Schiller, Mozart and Haydn, Kant and Fichte, Cavendish and Herschel were making way for Scott, Wordsworth, and Shelley, Heine and Balzac, Beethoven and Hegel – great physicists, biologists, chemists, mathematicians, historians, writers, and musicians by the score.

The idea that Europe was in her decrepitude merely proved the ignorance and want of enlightenment of most Americans. The error could be excused only by the plea that, in matters which most concerned Americans, Europe was a full century behind them. If they were right in thinking that the next necessity in human progress was to lift the average person upon an intellectual and social level with the most favored, they stood at least three generations nearer than Europe to that goal. But the assumption that equality was the necessary objective of civilization was itself a dubious one.

First World War Writers

The generation of British writers who participated in the First World War are often considered as a group, united as they were by university education and upper class backgrounds, as well as their shared sense of the horror and absurdity of the world's first thoroughly mechanized war. The "Great War" combined nearly unimaginable destruction (in the quietest intervals, 7,000 British soldiers were killed or wounded daily) with the sheer inanity of seemingly interminable trench stalemate. The writer/officer was in an ideal position to witness the farcical polarities of such a war: the idealism of the newly enlisted soldier and the cynicism of the veteran; the peaceful French countryside and the nightmare of bombardment; the earnest battle strategies and the stagnation of perpetual conflict. Paul Fussell, in *The Great War and Modern Memory*, asserts that to these writers "the great tragic satire which was the war [was] seen to consist of its own smaller constituent satires, or ironic actions".

Irony was the formal strategy chosen by each author as he confronted the war on paper. Fussell notes that this device, unprecedented in the literature of war, allowed the "trench writers" to avoid both sentimentality and understatement – either of which would have diminished the tragic absurdity of the situation. Ironic detachment provided the psychological distance necessary to commit to paper what was almost beyond description.

Frequently, the ironic mode was used to intensify the horror rather than to off-set it. One reads of saturation bombing, bayonetting, and gassing within a world incongruously filled with poppies, gardens, sheep, and shepherds. By casting modern carnage in the pastoral imagery familiar from a long English poetic tradition, these authors deepened the sense of brutal paradox. Thus, as Fussell notes, Wilfred Owen's metaphor of "The shrill, demented choirs of wailing shells" both "gauges the obscenity of industrialized murder and returns us for a fleeting instant to the pastoral world where the 'choirs' consist of benign insects and birds", where Owen suggested this pastoral

tradition only through allusion. Edmund Blunden, in *Understones of War*, describes the havoc wreaked on an actual pastoral setting: – the greensward, suited by nature for the raising of sheep, was all holes, and new ones appeared with a great uproar as we passed.

The imprint of the Great War on literary sensibility proved indelible; in different ways, the writers of the Second World War, and even of Korea and Vietnam, drew on the ironic tradition forged in the trenches of France.

Historical Fiction and Fictional History

Much as they may deplore the fact, historians have no monopoly on the past and no franchise as its privileged interpreters to the public. It may have been different once, but there can no longer be any doubt about the relegation of the historian to a back seat. Far surpassing works of history, as measured by the size of their public and the influence they exert, are the novel, works for the stage, the screen, and television. It is mainly from these sources that millions who never open a history book derive such conceptions, interpretations, convictions, or fantasies as they have about the past. Whatever gives shape to popular conceptions of the past is of concern to historians, and this surely includes fiction.

Broadly speaking, two types of fiction deal with the past – historical fiction and fictional history. The more common of the two is historical fiction, which places fictional characters and events in a more or less authentic historical background. Examples range from *War and Peace* to *Gone With the Wind*. Since all but a few novelists must place their fictional characters in some period, nearly all fiction can be thought of as in some degree historical. But the term is applied as a rule only to novels in which historical events figure prominently. Fictional history, on the other hand, portrays and focuses attention upon real historical figures and events, but with the license of the novelist to imagine and invent. It has yet to produce anything approaching Tolstoy's masterpiece. Some fictional history makes use of invented characters and events, and historical fiction at times mixes up fictional and nonfictional characters. As a result the two genres overlap sometimes, but not often enough to make the distinction unimportant.

Of the two, it is fictional history that is the greater source of mischief, for it is here that fabrication and fact, fiction and nonfiction, are most likely to be mixed and confused. Of course, historians themselves sometimes mix fact with fancy, but it is a rare one who does it consciously or deliberately, and he knows very well that if discovered he stands convicted of betraying his calling. The writer of fictional history, on the other hand, does this as a matter of course and with no compunction whatever. The production and consumption of fictional history appear to be growing of late. Part of the explanation of this is probably the fragmentation of history by professionals, their retreat into specializations, their abandonment of the narrative style, and with it the traditional patronage of lay readers. Fictional history has expanded to fill the gap thus created but has at the same time gone further to create a much larger readership than history books ever had.

Virginia Woolf's Success and Failure

Virginia Woolf's development as a novelist was deeply influenced by her struggle to reconcile feminism and art. Long before the aesthetic creed of Bloomsbury came into being she had learned from her father that a work of literature is no better than the morality which it is intended to express – a lesson she never forgot. Virginia Woolf was a passionate moralist, though she directed all her fervor into one narrow channel. The impulse to write *Three Guineas* possessed her for years, "violently ... persistently, pressingly, compulsorily," until she carried it into action. This moral fervor was not contained within the limits of her tracts, nor could it have been. Feminism is implicit in her novels. The novels are not, of course, didactic in the narrow sense of pleading for specific reforms, but they illustrate the dangers of one-sidedness and celebrate the androgynous mind.

Virginia Woolf's main emphasis in her feminist writings, as in the novels, was on self-reform, and on art as a means to that end. Novels and tracts alike grew out of a preoccupation with her own spiritual dilemma. Fiction was the medium within which Virginia Woolf controlled and directed this intense self-absorption. When she deserted art for propaganda, as in *Three Guineas*, her self-absorption got the upper hand. Thus, paradoxically, she was truer to her feminist ideas as a novelist than as a pamphleteer. Her social conscience and her aesthetic vision were mutually dependent. She could express her feminism only by means of her art; but her art owed its character to her feminism.

The contrast between Virginia Woolf's failure in *Three Guineas* and her triumph in *The Years* confirms this impression. In the first, confining herself to political and social controversy, she lost her grasp of reality and ended up talking to herself. In the second, striving, as she said, "to give the whole of the present society ... facts as well as the vision," she transcended purely personal preoccupations and created a lasting work of art. Virginia Woolf's direct attack on social evil is too shrill and self-indulgent to succeed, even as propaganda. On the other hand, her symbolic representation of the Wasteland – pollution, faithlessness, remorse – has a lucid objectivity that forces the reader to see through her eyes. The tract, with all its talk of reform, is one-sided. The novel is whole.

In Virginia Woolf's case, the myth of the artist as more or less helpless agent of his own creative drive seems to have a foundation in fact. She needed the discipline of art, because it permitted her to express her intense moral indignation, while at the same time controlling the disintegrating effects of that indignation upon her personality. Art produced feelings of release and harmony, such as she associated with the androgynous mind. When she avoided that discipline, as in *Three Guineas*, her writing tended to become morbid. In relation to the radiance of Virginia Woolf's artistic successes, therefore, *Three Guineas* represents a kind of negative definition. Through it we can glance into the heart of her darkness.

Meredith

With Meredith's *The Egoist* we enter into a critical problem that we have not yet before faced in these studies. That is the problem offered by a writer of recognizably impressive stature, whose work is informed by a muscular intelligence, whose language has splendor, whose "view of life" wins our respect, and yet for whom we are at best able to feel only a passive appreciation which amounts, practically, to indifference. We should be unjust to Meredith and to criticism if we should, giving in to the inertia of indifference, simply avoid dealing with him and thus avoid the problem along with him. He does not "speak to us", we might say; his meaning is not a "meaning for us"; he "leaves us cold". But do not the challenge and the excitement of the critical problem as such lie in that ambivalence of attitude which allows us to recognize the intelligence and even the splendor of Meredith's work, while, at the same time, we experience a lack of sympathy, a failure of any enthusiasm of response?

Mendelssohn's Music

In some circles, Mendelssohn's reputation diminished rapidly after his death in 1847. By 1852, he was already regarded by many as "the object of pitying disparagement". European musical audiences, newly enamored with the expansiveness of Wagner's *Tristan and Isolde*, soon found Mendelssohn's music too restrained and academic.

Post-Wagnerian anti-Romanticism did little to salvage the composer's standing. Proponents of Schoenberg and his twelve-tone serialism regarded Mendelssohn as a quaint, conservative composer who crafted superficial, "tenderly sentimental" music.

Such "arbiters" as these have moved far too illiberally to certain conclusions. The atmospheric, melodic beauty of the *Overture to A Midsummer Night's Dream* shows the imprint of an original mind, anticipating the orchestral achievement of Rimsky-Korsakov. At the time of its composition, the *Octet* displayed unexampled lightness and rhythmic effect; the impressionistic *Hebrides Overture* inspired the painting of Turner. And Mendelssohn's greatest pictorial works, the *Scottish* and *Italian* symphonies, constantly reveal new vistas. The work of one of the first, great nineteenth-century Nature composers, Mendelssohn's music simply endures; critics would do well to ask why.

Mary Shelley

Mary Shelley herself was the first to point to her fortuitous immersion in the literary and scientific revolutions of her day as the source of her novel *Frankenstein*. Her extreme youth, as

well as her sex, have contributed to the generally held opinion that she was not so much an author in her own right as a transparent medium through which passed the ideas of those around her. "All Mrs. Shelley did," writes Mario Praz, "was to provide a passive reflection of some of the wild fantasies which were living in the air about her."

Passive reflections, however, do not produce original works of literature, and *Frankenstein*, if not a great novel, was unquestionably an original one. The major Romantic and minor Gothic tradition to which it should have belonged was to the literature of the overreacher: the superman who breaks through normal human limitations to defy the rules of society and infringe upon the realm of God. In the Faust story, hypertrophy of the individual will is symbolized by a pact with the devil. Byron's and Balzac's heroes; the Wandering Jew; the chained and unchained Prometheus: all are overreachers, all are punished by their own excesses – by a surfeit of sensation, of experience, of knowledge and, most typically, by the doom of eternal life.

But Mary Shelley's overreacher is different. Frankenstein's exploration of the forbidden boundaries of human science does not cause the prolongation and extension of his own life, but the creation of a new one. He defies mortality not by living forever, but by giving birth.

Virginia Woolf

In *A Room of One's Own*, Virginia Woolf performs a typically stream-of-consciousness feat by beginning with a description of the view from her window: a leaf falls from a tree, and a woman in leather boots and a man in a maroon overcoat climb into a taxi and glide away. Woolf uses this moment to discuss the unity of the mind, and the effortlessness with which she had invested this ordinary sight with a kind of rhythmic order. She ends with a consideration of Coleridge's remark that a great mind is androgynous. "What does one mean by the unity of the mind?" Woolf asks.

One of Woolf's theses is that unity, and not repression, is the necessary state for creativity. Woolf describes men's sentences as having a particular shape, natural to men, but unnatural and clumsy to women. She rightly praises Austen for developing her own rhythm and her own sentence, which is expressive of her genius, her characters, and her history. Woolf suggests that the women's suffrage movement fomented a reaction of threatened male self-assertion that meant a decline in literary power. "It is fatal," she writes, "for any one who writes to think of their sex ... it is fatal for a woman to lay the least stress on any grievance; to plead justice with any cause; in any way to speak consciously as a women."

A Room of One's Own exhorts women to reach for a higher, almost religious approach to writing. "Do not dream influencing other people;" she writes, "think of things in themselves."

Virginia Woolf and Politics

The two essays in which Virginia Woolf explores women's role in art and politics have traditionally been seen as a problematical adjunct to her novels. While *A Room With a View*, with its acerbic wit, has been given grudging respect, the outspokenly programmatic *Three Guineas* has been dismissed as a pacifist-feminist tract. No doubt these essays lack the subtlety and superb control of the novels, but to a recent generation of critics they remain significant because of their anticipation of many of the concerns of contemporary feminism.

A Room of One's Own (1929) is written in the form of a lecture "delivered" at a fictitious women's college. Woolf begins by contrasting the paltry luncheon given at the college with the luxurious fare offered at a nearby men's university. The difference symbolizes more profound disparities which – Woolf now comes to her main point – bear directly on the fortunes of women artists. For the woman author, financial independence, opportunities for education, tranquility, and privacy are necessary preconditions, without which women are unlikely to produce works of genius. Great art can never be expected from "laboring, servile, or uneducated people". (Among modern feminists, Tillie Olsen makes a similar point in *Silences*, though without Woolf's undertone of class condescension.) When a woman obtains a room of her own, in all its senses, she may, according to Woolf, develop what Coleridge termed "the androgynous mind", one which, having united its "male" and "female" sides, "transcends and comprehends the feelings of both sexes".

In *Three Guineas* (1938) Woolf's central argument, again foreshadowing a key contention of later feminism, is that the process of changing gender restrictions in the public world and in the private individual are interdependent. Such issues as childrearing (which she felt should be a shared responsibility) and professional equality between the sexes are not separate considerations, but rather different aspects of the same problem. Woolf also attempts to define women's responsibilities in the larger political world. Discussing the probability of another world war, she argues that women with jobs in manufacturing should refuse to produce arms for use in a male-instigated debacle. Both at the time and since, many readers have found this argument naive. One working class reader, Agnes Smith, wrote Woolf that the book was decidedly class-bound; working women could hardly afford to jeopardize their employment for a pacifist ideal. Current feminist critics accept the validity of Smith's point – indeed they acknowledge that it exposes a limitation of Woolf's feminism generally – but they also note that the mild derision which greeted *Three Guineas* from the male establishment was typical of the reception often given a woman thinker's ideas.

Goethe

Unlike the carefully weighted and planned compositions of Dante, Goethe's writings have always the sense of immediacy and enthusiasm. He was a constant experimenter with life, with ideas, and with forms of writing. For the same reason, his works seldom have the qualities of finish or formal beauty which distinguish the masterpieces of Dante and Virgil. He came to love the

beauties of classicism but these were never an essential part of his make-up. Instead, the urgency of the moment, the spirit of the thing, guided his pen. As a result, nearly all his works have serious flaws of structure, of inconsistencies, of excesses and redundancies and externalities.

In the large sense, Goethe represents the fullest development of the romanticist. It has been argued that he should not be so designated because he so clearly matured and outgrew the kind of romanticism exhibited by Wordsworth, Shelley, and Keats. Shelley and Keats died young; Wordsworth lived narrowly and abandoned his early attitudes. In contrast, Goethe lived abundantly and developed his faith in the spirit, his understanding of nature and human nature, and his reliance on feelings as man's essential motivating force. The result was an all-encompassing vision of reality and a philosophy of life broader and deeper than the partial visions and attitudes of other romanticists. Yet the spirit of youthfulness, the impatience with close reasoning or "logic-chopping", and the continued faith in nature remained his to the end, together with an occasional waywardness and impulsiveness and a disregard of artistic or logical propriety which savor strongly of romantic individualism. Since so many twentieth-century thoughts and attitudes are similarly based on the stimulus of the Romantic Movement, Goethe stands as particularly the poet of modern times as Dante stood for medieval times and as Shakespeare for the Renaissance.

Jane Austen

Not a few of Jane Austen's personal acquaintances might have echoed Sir Samuel Egerton Brydges, who noticed that "she was fair and handsome, slight and elegant, but with cheeks a little too full," while "never suspect[ing] she was an authoress." For this novelist whose personal obscurity was more complete than that of any other famous writer was always quick to insist either on complete anonymity or on the propriety of her limited craft, her delight in delineating just "3 or 4 Families in a Country Village". With her self-deprecatory remarks about her inability to join "strong manly, spirited sketches, full of Variety and Glow" with her "litter bit (two Inches wide) of Ivory", Jane Austen perpetuated the belief among her friends that her art was just an accomplishment "by a lady", if anything "rather too light and bright and sparkling". In this respect she resembled one of her favorite contemporaries, Mary Brunton, who would rather have "glid[ed] through the world unknown" than been "suspected of literary airs – to be shunned, as literary women are, by the more pretending of their own sex, and abhorred, as literary women are, by the more pretending of the other! – my dear, I would sooner exhibit as a ropedancer."

Yet, decorous though they might first seem, Austen's self-effacing anonymity and her modest description of her miniaturist art also imply a criticism, even a rejection, of the world at large. For, as Gaston Bachelard explains, the miniature "allows us to be world conscious at slight risk". While the creators of satirically conceived diminutive landscapes seem to see everything as small because they are themselves so grand, Austen's analogy for her art – her "little bit (two Inches wide) of Ivory" – suggests a fragility that reminds us of the risk and instability outside the fictional space. Besides seeing her art metaphorically, as her critics would too, in relation to

female arts severely devalued until quite recently (for painting on ivory was traditionally a "ladylike" occupation), Austen attempted through self-imposed novelistic limitations to define a secure place, even as she seemed to admit the impossibility of actually inhabiting such a small space with any degree of comfort. And always, for Austen, it is women – because they are too vulnerable in the world at large – who must acquiesce in their own confinement, no matter how stifling it may be.

Dreiser's Work

Most arguments about Dreiser's work center around the question of what is the overriding value in a work of art: content or form. His supporters, who included Frank Norris, H.L. Mencken, and even Nobelist Sinclair Lewis, maintained that his courageous truth-telling realism "cleared the trail from Victorian timidity in American fiction to honesty, boldness, and passion of life". They argued that his style, inelegant as it was, represented his subject more appropriately than genteel aestheticism would have done.

Dreiser's antagonists, chiefly critics who embraced the New Humanism, condemned his crude style and his choice of prosaic characters and mundane situations. They attacked his work as vulgar because he used commonplace subjects, and immoral because he questioned accepted values. Some of their animus can be attributed to sharp political differences between them and the writers of so-called proletarian literature, like Farrell, Steinbeck, and Dos Passos. These impassioned critics deplored what they deemed the crude anti-intellectualism of the naturalists. Others, like Kazin and Cowley, wrote about Dreiser's work as if it had emanated without thought, care, or design, mirroring reality and only, as if by accident, unconsciously reaching artistic heights.

The doctrinal dispute continues. The tradition, inherited by Dreiser from Defoe, appears in added strength and new forms in recent works of Truman Capote and Norman Mailer. Prisoners, picketers, slum children and their like become the protagonists of best-selling works, while gossamer tales of modern Brahmins are spun by Jamesian adherents.

The Cardinal and Bosola

The curtain rises; the Cardinal and Daniel de Bosola enter from the right. In appearance, the Cardinal is something between an El Greco cardinal and a van Dyck noble lord. He has the tall, spare form – the elongated hands and features – of the former; the trim pointed beard, the imperial repose, the commanding authority of the latter. But the El Greco features are not really those of asceticism or inner mystic spirituality. They are the index to a cold, refined but ruthless cruelty in a highly civilized controlled form. Neither is the imperial repose an aloof mood of proud detachment. It is a refined expression of satanic pride of place and talent.

To a degree, the Cardinal's coldness is artificially cultivated. He has defined himself against his younger brother Duke Ferdinand and is the opposite to the overwrought emotionality of the latter. But the Cardinal's aloof mood is not one of bland detachment. It is the deliberate detachment of a methodical man who collects his thoughts and emotions into the most compact and formidable shape – that when he strikes, he may strike with the more efficient and devastating force. His easy movements are those of the slowly circling eagle just before the swift descent with exposed talons. Above all else, he is a man who never for a moment doubts his destined authority as a governor. He derisively and sharply rebukes his brother the Duke as easily and readily as he mocks his mistress Julia. If he has betrayed his hireling Bosola, he uses his brother as the tool to win back his "familiar". His court dress is a long brilliant scarlet cardinal's gown with white cuffs and a white collar turned back over the red, both collar and cuffs being elaborately scalloped and embroidered. He wears a small cape, reaching only to the elbows. His cassock is buttoned to the ground, giving a heightened effect to his already tall presence. Richelieu would have adored his neatly trimmed beard. A richly jeweled and ornamented cross lies on his breast, suspended from his neck by a gold chain.

Bosola, for his part, is the Renaissance "familiar" dressed conventionally in somber black with a white collar. He wears a chain about his neck, a suspended ornament, and a sword. Although a "bravo", he must not be thought of as a leather-jacketed, heavy-booted tough, squat and swarthy. Still less is he a sneering, leering, melodramatic villain of the Victorian gaslight tradition. Like his black-and-white clothes, he is a colorful contradiction, a scholar-assassin, a humanist-hangman; introverted and introspective, yet ruthless in action; moody and reluctant, yet violent. He is a man of scholarly taste and subtle intellectual discrimination doing the work of a hired ruffian. In general effect, his impersonator must achieve suppleness and subtlety of nature, a highly complex, compressed, yet well restrained intensity of temperament. Like Duke Ferdinand, he is inwardly tormented, but not by undiluted passion. His dominant emotion is an intellectualized one: that of disgust at a world filled with knavery and folly, but in which he must play a part and that a lowly, despicable one. He is the kind of rarity that Browning loved to depict in his Renaissance monologues.

Samuel Johnson

Many readers assume that, as a neoclassical literary critic, Samuel Johnson would normally prefer the abstract, the formal, and the regulated to the concrete, the natural, and the spontaneous in a work of literature. Yet any close reading of Johnson's criticism shows that Johnson is not blind to the importance of the immediate, vivid, specific detail in literature; rather, he would underscore the need for the telling rather than the merely accidental detail.

In other ways, too, Johnson's critical method has much in common with that of the Romantics, with whom Johnson and, indeed, the entire neoclassical tradition are generally supposed to be in conflict. Johnson was well aware, for example, of the sterility of literary criticism that is

legalistic or pedantic, as was the case with the worst products of the neoclassical school. His famous argument against the slavish following of the "three unities" of classical drama is a good example, as is his defense of the supposedly illegitimate "tragicomic" mode of Shakespeare's latest plays. Note, in particular, the basis of that defense: "That this is a practice contrary to the rules of criticism," Johnson wrote," will be readily allowed; but there is always an appeal from criticism to nature."

The sentiment thus expressed could easily be endorsed by any of the Romantics, the empiricism it exemplifies is a vital quality of Johnson's criticism, as is the willingness to jettison "laws" of criticism when to do so makes possible a more direct appeal to the emotions of the reader. Addison's *Cato*, highly praised in Johnson's day for its "correctness", is damned with faint praise by Johnson: "*Cato* affords a splendid exhibition of artificial and fictitious manners, and delivers just and noble sentiments, in diction easy, elevated, and harmonious, but its hopes and fears communicate no vibration to the heart." Wordsworth could hardly demur.

Even on the question of poetic diction, which, according to the usual interpretation of Wordsworth's 1800 preface to the *Lyrical Ballads*, was the central area of conflict between Romantic and Augustan, Johnson's views are surprisingly "modern". In his *Life of Dryden*, he defends the use of a special diction in poetry, it is true; but his reasons are all-important. For Johnson, poetic diction should serve the ends of direct emotional impact and ease of comprehension, not those of false profundity or grandiosity. "Words too familiar," he wrote, "or too remote, defeat the purpose of a poet. From those sounds which we hear on small or on coarse occasions, we do not easily receive strong impressions, or delightful images; and words to which we are nearly strangers, whenever they occur, draw that attention on themselves which they should transmit to things." If the poetic diction of the neoclassical poets, at its worst, erects needless barriers between reader and meaning, that envisioned by Johnson would do just the opposite: it would put the reader in closer contact with the "things" that are the poem's subject.

Shaw's View of Art

Shaw's defense of a theater of ideas brought him up against both his great bugbears – commercialized art on the one hand and Art for Art's Sake on the other. His teaching is that beauty is a by-product of other activity; that the artist writes out of moral passion (in forms varying from political conviction to religious zeal), not out of love of art; that the pursuit of art for its own sake is a form of self-indulgence as bad as any other sort of sensuality. In the end, the errors of "pure" art and of commercialized art are identical: they both appeal primarily to the senses. True art, on the other hand, is not merely a matter of pleasure. It may be unpleasant. A favorite Shavian metaphor for the function of the arts is that of tooth-pulling. Even if the patient is under laughing gas, the tooth is still pulled.

The history of aesthetics affords more examples of a didactic than of a hedonic view. But Shaw's didacticism takes an unusual turn in its application to the history of the arts. If, as Shaw holds,

ideas are a most important part of a work of art, and if, as he also holds, ideas go out of date, it follows that even the best works of art go out of date in some important respects and that the generally held view that great works are in all respects eternal is not shared by Shaw. In the preface to *Three Plays for Puritans*, he maintains that renewal in the arts means renewal in philosophy, that the first great artist who comes along after a renewal gives to the new philosophy full and final form, that subsequent artists, though even more gifted, can do nothing but refine upon the master without matching him. Shaw, whose essential modesty is as disarming as his pose of vanity is disconcerting, assigns to himself the role, not of the master, but of the pioneer, the role of a Marlowe rather than of a Shakespeare. "The whirligig of time will soon bring my audiences to my own point of view," he writes, "and then the next Shakespeare that comes along will turn these petty tentatives of mine into masterpieces final for their epoch."

"Final for their epoch" – even Shakespearean masterpieces are not final beyond that. No one, says Shaw, will ever write a better tragedy than *Lear* or a better opera than *Don Giovanni* or a better music drama than *Der Ring des Nibelungen*; but just as essential to a play as this aesthetic merit is moral relevance which, if we take a naturalistic and historical view of morals, it loses, or partly loses, in time. Shaw, who has the courage of his historicism, consistently withstands the view that moral problems do not change, and argues therefore that for us modern literature and music form a Bible surpassing in significance the Hebrew Bible. That is Shaw's anticipatory challenge to the neo-orthodoxy of today.

Josquin in Obscurity

Until Josquin des Prez, 1440-1521, Western music was liturgical, designed as an accompaniment to worship. Like the intricately carved gargoyles perched atop medieval cathedrals beyond sight of any human, music was composed to please God before anybody else; its dominant theme was reverence. Emotion was there, but it was the grief of Mary standing at the foot of the Cross, the joy of the faithful hailing Christ's resurrection. Even the secular music of the Middle Ages was tied to predetermined patterns that sometimes seemed to stand in the way of individual expression.

While keeping one foot firmly planted in the divine world, Josquin stepped with the other into the human. He scored magnificent masses, but also newly expressive motets such as the lament of David over his son Absalom or the "Deploration d'Ockeghem", a dirge on the death of Ockeghem, the greatest master before Josquin, a motet written all in black notes, and one of the most profoundly moving scores of the Renaissance. Josquin was the first composer to set psalms to music. But alongside *Benedicite omnia opera Domini Domino* ("Bless the Lord, all ye works of the Lord") he put *El Gillo* ("The cricket is a good singer who manages long poems") and *Allegez moy* ("Solace me, sweet pleasant brunette"). Josquin was praised by Martin Luther, for his music blends respect for tradition with a rebel's willingness to risk the horizon. What Galileo was to science, Josquin was to music. While preserving their allegiance to God, both asserted a new importance for man.

Why then should Josquin languish in relative obscurity? The answer has to do with the separation of concept from performance in music. In fine art, concept and performance are one; both the art lover and the art historian have thousands of years of paintings, drawings and sculptures to study and enjoy. Similarly with literature: Poetry, fiction, drama, and criticism survive on the printed page or in manuscript for judgment and admiration by succeeding generations. But musical notation on a page is not art, no matter how lofty or excellent the composer's conception; it is, crudely put, a set of directions for producing art. Being highly symbolic, musical notation requires training before it can even be read, let alone performed. Moreover, because the musical conventions of other days are not ours, translation of a Renaissance score into modern notation brings difficulties of its own. For example, the Renaissance notation of Josquin's day did not designate the tempo at which the music should be played or sung. It did not indicate all flats or sharps; these were sounded in accordance with musicianly rules, which were capable of transforming major to minor, minor to major, diatonic to chromatic sound, and thus affect melody, harmony, and musical expression. A Renaissance composition might include several parts – but it did not indicate which were to be sung, which to be played, nor even whether instruments were to be used at all.

Thus, Renaissance notation permits of several interpretations and an imaginative musician may give an interpretation that is a revelation. But no matter how imaginative, few modern musicians can offer any interpretation of Renaissance music. The public for it is small, limiting the number of musicians who can afford to learn, rehearse, and perform it. Most of those who attempt it at all are students organized in *collegia musica* whose memberships have a distressing habit of changing every semester, thus preventing directors from maintaining the year-in year-out continuity required to achieve excellence of performance. Finally, the instruments used in Renaissance times – drummhorns, recorders, rauschpfeifen, shawms, sackbuts, organettes – must be specially procured.

John A. Rein

Of several known altar paintings by John A. Rein, only one has been researched. It is *The Last Supper*, painted in 1895 for a small country church near Roseau in northern Minnesota. The circular arrangement of the figures and the rugged expressiveness of their faces brings to mind the same subject as depicted in the folk baroque altars of central Norway. A comparison with a more readily available model, however, tends to weaken the theory of Norwegian inspiration. In the same edition of the Norwegian-American Bible used by the artist Lars Christenson, there is an illustration of da Vinci's *Last Supper*, in which the figures have been rearranged to fit the page by cutting off those on both ends and placing them together below the center section. The result bears several striking similarities to Rein's arrangement of figures. For example, the five figures in front of the table face right and look toward one figure at the end, who faces left. The Bible also includes portraits of the apostles drawn from da Vinci's fresco. Most of them reappear in easily recognizable form as the heads in Rein's work.

Rein's *The Last Supper* appears to be very much his own creation, freely put together from elements in the limited art work available to him. When these sources were not sufficient for his needs, he turned to what he saw around him. The chair in the foreground is of the peasant empire type which was popular in the early Norwegian settlements. The pitcher and bowl, motifs possibly introduced as a result of confusion between the themes of the Washing of the Feet and the Last Supper, appear to have come directly from a nineteenth-century washstand.

While the specific sources for Rein's altar painting appear to have been American, the strong expressive color and undulating line are typical of Norwegian art. The strong impact of the work results, in part, from the organic character of the shadow from which the figures rise and from the converging lines of the floor and ceiling which center on the figure of Christ, drawing the viewer into this holy company.

The case of John Rein poses the problem of how the concept of ethnicity relates to that of folk art. He learned the woodworker's trade in Norway, and he may also have acquired there an affinity for certain kinds of line and color; as a painter, however, he was largely self-taught. His work is distinguished as much by those characteristics which we have come to call primitive as by those which might be considered part of Norwegian tradition. He is, therefore, close to that large body of self-taught American folk artists who, out of a drive to express themselves in form, have experimented their way to a medium through which their creative needs are fulfilled. In this art with its "private vision" and "personal universe", to quote Herbert Hemphill, Jr., there can be no *ethnicity*. The word ethnicity, itself, implies an acquired set of patterns and beliefs which characterize a group. In order to bring ethnicity into a discussion of folk art, one is forced to recognize tradition as a major element in it. There are purely self-taught artists among the Norwegian-Americans, some of whom are of considerable interest, but there is nothing intrinsically Norwegian-American in their work. Rein falls close to these.

Davie's Poetry

The poet and critic W.H. Auden once wrote, "The critical opinions of a writer should always be taken with a large grain of salt. For the most part, they are manifestations of his debate with himself as to what he should do next and what he should avoid." While Auden denies the applicability of a poet's critical theories to poetry in general, he emphasizes the usefulness of those theories as a key to the poet's own work. In this paper, I have used the criticism of Donald Davie as a gloss on Davie's own poetry, taking the criticism not necessarily as an objective description of the real workings of the poetry but, as Auden might suggest, as an indication of Davie's goals as poet.

Over the twenty-odd years of Davie's career, these goals have undergone no fundamental change. The style of poetry Davie described as his ideal in his critical essay *Purity of Diction in English Verse*, published in 1953, is the style Davie's own poetry still aspires to in his most recent work.

The changes in Davie's poetry over the years have been directed toward not an abandonment but a fuller realization of the goal he envisaged in the early fifties, which he summarized as, in Eliot's phrase, "the perfection of a common language".

Calvin Bedient, regards Davie's critical theories as wrongheaded, sees Davie's best poetry as a tacit repudiation of those theories; Davie's finest lyrics, according to Bedient, were written in spite of, not because of, his critical ideas. For Bedient, the growth of Davie's poetic skill reflects his gradual "escape" from the influence of his own poetic ideals. But a more careful reading of Davie suggests that, on the contrary, Davie's best poems are not ones in which he deviates from his stated poetic ideals but rather those in which he comes closest to embodying them; and this he has done with increasing frequency in his recent work.

The canons of Davie's criticism are basically four:

(1) Poetry should be "pure" in diction, which involves, primarily, economy and restraint in the use of metaphor. The poet, according to Davie, is concerned with "purifying" as well as "expending" the language; that is, not only must he coin new ways of seeing the world (new metaphors and images), but he must also preserve and refurbish the old ways. Good poetry does this through the use of rhythm and sound and through vivid, specific nouns and verbs that help to revivify the meaning buried in dead metaphors and images.

(2) Poetry should adhere closely to the twin models of, on the one hand, "prose and careful conversation", and on the other, the usages of the great poets of the past. The poet must be chary of drastic innovation without a strong reason.

(3) Poetry should use, as far as possible, the syntax of ordinary language.

(4) Poetry should handle its meanings as clearly and explicitly as possible, drawing distinctions that are at once subtle and lucid. Poetry should be intelligent as well as passionate.

Davie makes it clear that poetry that follows these canons may not be the only real poetry, or even the best poetry; as he points out, this kind of "prosaic strength" is most characteristic not of great poets but of good ones, and Davie lists Gower, Greville, Denham, Goldsmith, Johnson, and Cowper as examples. But it is this company of solid, intelligible, honest poets that Davie aspires to join, and it is by their standards that we must accordingly judge Davie's work.

Dickens and *David Copperfield*

When completing *David Copperfield*, Dickens experienced a powerful aftereffect that left him confused about "whether to laugh or to cry ... strangely divided ... between sorrow and joy". He felt that he had been turned inside out, his inner life now visible, in partly disguised forms, in the shadowy world of ordinary daylight. The story he had written was so deeply personal that "no

one can believe [it] in the reading, more than I have believed it in the writing". Having transformed his private memories and his emotional life into a public myth about himself, particularly his development from an abandoned child into a great popular artist surrounded by love and success, he felt the excitement both of exposure and catharsis. Exorcising the wounds of childhood and young adulthood, he also dramatized the unresolved problems of his personality and his marriage, anticipating the turmoil that was to come. Though energized by the process of writing, he was also exhausted by "heaps of Copperfieldian blots", by that "tremendous paroxysm of Copperfield". Towards the end, he felt "rigid with Copperfield ... from head to foot". When he finally put down his pen in October 1850, he took up his "idea of wandering somewhere for a day or two". Almost inevitably, he went back "to Rochester ... where I was a small boy".

In *David Copperfield* he re-created in mythic terms his relationship with his mother, his father, his siblings, particularly Fanny, and with his wife and his wife's sisters. The novel was more precious to him than his own children because the favorite child was himself. Soon after beginning, he confessed that he had stuck to that fictional name through the exploration of alternative titles because he had, even at the earliest stage, recognized that he was writing a book about himself.

His passion for names also expressed his need to pattern and control. After the birth of Katie in 1839, he assumed the right to name all his children (Catherine had "little or nothing to say" about that). The elaborate christening of Alfred D'Orsay Tennyson Dickens provides the representative example of the novelist imposing his literary constructs on other people's lives as well as his own. When it came to his family, he did not admit of any distinction. When it came to his novels, the distinction between self and other was subordinated to the dramatization of the many varieties of the single self. Changing Charles Dickens into David Copperfield had the force both of unconscious reversal and of minimal autobiographical distancing. At the heart of the novel was a partly mediated version of himself that represented his effort to claim that he had come through, that all was well with him as he approached the age of forty.

Alain Robbe-Grillet

Alain Robbe-Grillet is not as cerebral a writer as Nathalie Sarraute or Michel Butor. But he has been more popular, particularly in America. Perhaps that is one reason. There are others. He relies even more heavily than his fellow novelists on the *roman policier* for basic structure, and detective stories have a built-in popular fascination. Most of his characters, so far as we can determine, seem to be psycho-pathological. He is therefore a kind of Alfred Hitchcock of the novel. He has also devoted himself to film writing and film making in association with the *Nouvele Vague*. His cinema-novels as he called them, rather than film scripts, *Lannée Derniére à Marienbad* (1961) and *L'Immortelle* (1963), have certainly brought him a wider public exposure than would have been possible with the novels alone. Furthermore his novels have had wide paperback distribution in English translation. But he is an authentic New Novelist and therefore

disturbing but not easy. He is reported to have said that he wants his reader to feel disappointed (in their expectation of clarification, presumably), that if they feel disappointed he knows he has succeeded in what he was trying to do. At least one critic has placed Robbe-Grillet at "the most advanced point of evolution of the twentieth-century novel and film".

He first turned to the cinema in collaboration with the film director Alain Resnais. In 1961 *L'Année Dernière à Marienbad* hit the movie world with an originality that for a time usurped the attention customarily given to the Italian films of Fellini or the Swedish films of Bergman. *Last Year at Marienbad* played long runs in the art film houses in New York and across the United States. Bruce Morrissette in a critique of the film pointed out to less perceptive critics that it represented a continuation of techniques established in the earlier novels: "False scenes and objectified hypothesis as in *The Voyeur*, a subjective universe converted into objective perceptions as in *Jealousy* – with its detemporalization of mental states, its mixture of memories (true and false), of desire images and affective projections – the dissolves' found in *The Labyrinth*: all these reach a high point in *Marienbad* ... The spectator's work, like that of the reader, becomes an integral part of the cinematic or novelistic creation". The viewer like the reader was expected to collaborate in creating meaning. *Marienbad* takes place at an ornate Bavarian palace; the action is circular, beginning with "once more" as the camera moves through Freudian corridors, empty rooms and a formal garden (with a return at the end); characters emerge as a young woman, A, an older man, M (presumably her jealous husband), and a persistent lover, X. Fantasies of seduction, resistance, desire, fear, rape, and even murder are projected; but whose they are, A's or M's or X's, is never clear. You take your choice.

Consistency in African Art

When you first saw a piece of African art, it impressed you as a unit; you did not see it as a collection of shapes or forms. This, of course, means that the shapes and volumes within the sculpture itself were coordinated so successfully that the viewer was affected emotionally.

It is entirely valid to ask how, from a purely artistic point of view, this unity was achieved. And we must also inquire whether there is a recurrent pattern or rules or a plastic language and vocabulary which is responsible for the powerful communication of emotion which the best African sculpture achieves. If there is such a pattern or rules, are these rules applied consciously or instinctively to obtain so many works of such high artistic quality?

It is obvious from the study of art history that an intense and unified emotional experience, such as the Christian credo of the Byzantine or 12th or 13th century Europe, when expressed in art forms, gave great unity, coherence, and power to art. But such an integrated feeling was only the inspirational element for the artist, only the starting point of the creative act. The expression of this emotion and its realization in the work could be done only with discipline and thorough knowledge of the craft. And the African sculptor was a highly trained workman. He started his apprenticeship with a master when a child, and he learned the tribal styles and the use of tools

and the nature of woods so thoroughly that his carving became what Boas calls "motor action". He carved automatically and instinctively.

The African carver followed his rules without thinking of them; indeed, they never seem to have been formulated in words. But such rules existed, for accident and coincidence cannot explain the common plastic language of African sculpture. There is too great a consistency from one work to another. Yet, although the African, with amazing insight into art, used these rules, I am certain that he was not conscious of them. This is the great mystery of such a traditional art: talent, or the ability certain people have, without conscious effort, to follow the rules which later the analyst can discover only from the work of art which has already been created.

Art of Middle Ages

In the art of the Middle Ages, we never encounter the personality of the artist as an individual; rather it is diffused through the artistic genius of centuries embodied in the rules of religious art. Art of the Middle Ages is first a sacred script, the symbols and meanings of which were well settled. The circular halo placed vertically behind the head signifies sainthood, while the halo impressed with a cross signifies divinity. By bare feet, we recognize God, the angels, Jesus Christ and the apostles, but for an artist to have depicted the Virgin Mary with bare feet would have been tantamount to heresy. Several concentric, wavy lines represent the sky, while parallel lines water or the sea. A tree, which is to say a single stalk with two or three stylized leaves, informs us that the scene is laid on earth. A tower with a window indicates a village, and, should an angel be watching from the battlements, that city is thereby identified as Jerusalem. Saint Peter is always depicted with curly hair, a short beard, and a tonsure, while Saint Paul has always a bald head and a long beard.

A second characteristic of this iconography is obedience to a sacred mathematics. "The Divine Wisdom", wrote Saint Augustine, "reveals itself everywhere in numbers", a doctrine attributable to the neo-Platonists who revived the genius of Pythagoras. Twelve is the master number of the Church and is the product of three, the number of the Trinity, and four, the number of material elements. The number seven, the most mysterious of all numbers, is the sum of four and three. There are the seven ages of man, seven virtues, seven planets. In the final analysis, the seven-tone scale of Gregorian music is the sensible embodiment of the order of the universe. Numbers require also a symmetry. At Charters, a stained glass window show the four prophets, Isaac, Ezekiel, Daniel, and Jeremiah, carrying on their shoulders the four evangelists, Matthew, Mark, Luke and John.

A third characteristic of this art is to be a symbolic language, showing us one thing and inviting us to see another. In this respect, the artist was called upon to imitate God, who had hidden a profound meaning behind the literal and wished nature itself to be a moral lesson to man. Thus, every painting is an allegory. In a scene of the final judgment, we see the foolish virgins at the left hand of Jesus and the wise at his right, and we understand that this symbolizes those who are

lost and those who are saved. Even seemingly insignificant details carry hidden meaning: The lion in a stained glass window is the figure of the Resurrection.

These, then, are the defining characteristics of the art of the Middle Ages, a system within which even the most mediocre talent was elevated by the genius of the centuries. The artists of the early Renaissance broke with tradition at their own peril. When they are not outstanding, they are scarcely able to avoid insignificance and banality in their religious works, and, even when they are great, they are no more than the equals of the old masters who passively followed the sacred rules.

African Art

African art could have been observed and collected by Europeans no earlier than the second half of the fifteenth century. Before that time Europe knew of Africa only through the writing of classical authors such as Pliny and Herodotus and the reports of a few Arabic travelers. Unfortunately, until the latter years of the nineteenth century Europe was little interested in the arts of Africa except as curiosities and souvenirs of exotic peoples. Indeed, with the growth of the slave trade, colonial exploitation, and Christian missionizing the arts were presented as evidence of the low state of heathen savagery of the African, justifying both exploitation and missionary zeal. Even with the early growth of the discipline of anthropology the assumption was that Africa was a continent of savages, low on the scale of evolutionary development, and that these savages, because they were "preliterate", would, by definition, have no history and no government worth notice.

In recent years the development of critical studies of oral traditions, of accounts by Islamic travelers of the great Sudanese kingdoms, of the descriptions of the coast by early European travelers, and – above all – of the concept of cultural relativism, has led to a far more realistic assessment of the African, his culture, history, and arts.

Cultural relativism is, in essence, the attitude whereby cultures other than one's own are viewed in their terms and on their merits. As an alternative to the prejudgment of missionaries and colonials it allows us to view the cultures and arts of the African without the necessity of judging his beliefs and actions against a Judeo-Christian moralistic base, or his art against a Greco-Renaissance yardstick.

Curiously, the "discovery" and enthusiasm for African art early in this century was not based on an objective, scientific assessment but rather resulted from an excess of romantic rebellion at the end of the last century against the Classical and Naturalist roots of Western art. Unfortunately this uncritical adulation swept aside many rational concerns to focus upon African sculpture as if it were the product of a romantic, rebellious, fin de siècle, European movement. Obviously, African art is neither anti-classical nor anti-naturalistic: to be either it would have had to have had its roots in Classicism or in Naturalism, both European in origin. Nor was the concept of

rebellion a part of the heritage of art in sub-Saharan Africa; rather, as we shall see, it was an art conservative in impulse and stable in concept.

We may admire these sculptures from a purely twentieth century esthetic, but if we so limit our admiration we will most certainly fail to understand them in the context of their appearance as documents of African thought and action.

In sharp contrast to the arts of the recent past in the Western world, by far the greatest part, in fact nearly all of the art of history of the world, including traditional Africa, was positive in its orientation; that is, it conformed in style and meaning to the expectations – the norms – of its patrons and audience. Those norms were shared by nearly all members of the society; thus, the arts were conservative and conformist. However, it must be stressed that they were not merely passive reflections, for they contributed actively to the sense of well-being of the parent culture. Indeed, the perishable nature of wood – the dominant medium for sculpture – ensured that each generation reaffirmed its faith by re-creating its arts.

Parthenon

How buildings are depicted indicates how they are perceived. To the serious travelers of the eighteenth century, like James Stuart and Nicholas Revett who took it upon themselves to record the legendary remains of Greece for the first time since antiquity, there are two modes of perceptions: the topical and the archaeological. To introduce each monument, they resorted to the picturesque tableau. They show the Parthenon at the time of their visit in 1751, when Athens was a sleepy provincial town within the Ottoman Empire and the Acropolis served as the headquarters for the Turkish governor. The temple stands in a random cluster of modest houses; in it we can see a Turk on horseback and, through the colonnade, the vaulted forms of the small Byzantine church that rose within the body of the temple during the Middle Ages. This is what the Parthenon looks like today, the authors are saying; and this depiction carries at once the quaint appeal of an exotic land and that sense of the vanity of things which comes over us at the sight of the sad dilapidation of one-time splendors.

But when they turn from romance to archaeology, the task of showing the Parthenon not as it is now but as it was then, Stuart and Revett restrict themselves to the measured drawing. They re-create, in immaculate engravings of sharp clear lines, the original design of the temple in suitably reduced scale and with a careful tally of dimensions. We are confronted again with the traditional abstractions of the architect's trade. Indeed, those architects who, in subsequent decades, wished to imitate the Parthenon as a venerable form of rich associational value could do so readily from these precise plates of Stuart and Revett, without once having seen Athens for themselves. In nineteenth century Philadelphia, for example, the disembodied facade of the Parthenon is reconstructed as the Second Bank of the United States in an urban milieu that is completely alien to the setting of the prototype.

Against the engravings of Stuart and Revett, we might pit two pencil sketches of the Acropolis made by Le Corbusier during his apprenticeship travels in the early years of this century. The close-up view is neither picturesque nor archaeological. It does not show us the ubiquitous tourists scrambling over the site, for example, nor any other transient feature of local relevance. Nor is the sketch a reproducible paradigm of the essential design of the Parthenon. Instead, we see the temple the way Le Corbusier experienced it, climbing toward it up the steep west slope of this natural citadel, and catching sight of it at a dynamic angle through the inner colonnade of the Propylaea, the ceremonial gate of the Acropolis. The long view show the building in relation to the larger shapes of nature that complement its form: the pedestal of the Acropolis spur that lifts it up like a piece of sculpture and the Attic mountain chain on the horizon which echoes its mass. And when Le Corbusier draws on this experience later in his own work, it is the memory of the building as foil to nature that guides his vision.

Movies and Politics

Moviemakers have always been interested in politicians, and vice-versa. As early in 1912, Raoul Walsh followed Pancho Villa around, filming his ambushes and executions. In Russian, Sergei Eisenstein made several films at Stalin's request, including *Alexander Nevski* in 1928 and *Ivan the Terrible* in 1945, both of which made the new regime appear to be the heir of a glorious revolutionary tradition. Hitler himself charged Leni Riefenstahl to film the Nazi rallies at Nuremberg in 1934. The result was the *Triumph of Will*, which took two years to make and included oceans of swastika flags, miles of military parades, stylized eagles, rolling drums, and an omnipresent Hitler whose profile stood out against the sky.

But the movies soon helped create a political style less stridently heroic and melodramatic than that inspired by the theater and opera. At the beginning, of course, early cinema techniques encouraged the leader to pantomime heavily with excessive gestures and expressions. The result was similar to expressionist theater. But it soon became clear the cinema offered possibilities unknown on the stage: for example, the close-up, which abolished the distance between the actor and the audience and made exaggerated gestures unnecessary. With the actor's image enlarged on the screen, even a trembling of the lips or batting the eyelids would be magnified. When the talkies appeared, the theatrical delivery of lines was no longer the rule. A conversational tone – even a whisper – was easily heard by the audience, making actors adopt a more natural style.

Political leaders have adapted their style to this evolution of the dramatic arts. The hero leader necessarily has a style more suited to the theater or silent movies and is less able to use the new tone required by cinema and television, which is more sober, allusive, and elliptical. In this sense, de Gaulle was of the theater generation while Giscard d'Estaing belongs to the cinema and television generation that understands the need for a more nuanced "stage presence".

Another result of the cinema has been to make actors more influential as models to imitate, since they are so much more visible. From 1920 to 1932, stars were inaccessible, marmoreal, and

inimitable. They were idols, surrounded by an aura of myth. In short, they were the cinema equivalent of the hero leader. During the 1930s and 1940s, the star became more human. He or she, though still shining brightly, was less exceptional, a bit more like the rest of us. The star became a model that could be imitated – like the charm leader.

And finally in the 1950s and after, stars became virtually the reflection of the spectator if not, indeed, his double. It became more difficult to imitate a star, since he or she was already like everyone else. This corresponded to the political Mr. Everyman.

第四部分　　宗教、哲学、历史、教育

Hypotheses

In science as elsewhere, we meet the assumptions of convenience and expedience, such as equations that assume frictionless machines or chemicals in a pure state. But by far the most important function of language in the development of scientific understanding and control of the world about us is the use of a kind of assumption called hypothesis at first, theory in a more developed state, and law when its implications have been extensively corroborated. A hypothesis resembles other assumptions in that it may be either true or false and may be used as the premise of rational action; otherwise it differs radically as to function and purpose. Hypotheses are employed experimentally in the search for truth. Without them the so-called scientific method is not possible. The reason for this is not always readily grasped and will now be illustrated in some detail.

Suppose, for example, that you are about to prepare an account of some fairly complex subject, such as the history of marriage. As soon as you have arrived at a clear working definition of your topic, you begin the collection of data. Now a datum is an item of some sort regarded as relevant to your problem. But everything is in some way related to everything else, and since you cannot possible consider all the facts related to marriage, you must limit the field of relevance in some practical, arbitrary manner. Let us assume that you are at work on the status of marriage in modern urban society; perhaps you may attempt to discover to what extent the institution persists because it is biologically useful, economically expedient, socially convenient, religiously compulsory, or merely psychologically traditional. To proceed thus is to set up a fivefold hypothesis that enables you to gather from the innumerable items cast up by the sea of experience upon the shores of your observation only the limited number of relevant data – relevant, that is, to one or more of the five factors of your hypothesis. The hypothesis (the reference of the symbol hypothesis) is like a light by means of which we search for truth; but it is a colored light that may render invisible the very object we seek. That is why, after a fair trial, we must not hesitate to abandon one color for another. When our hypothesis possesses the proper color and intensity, it will reveal some of the facts as data, which may then be further studied and verified as signs of truth.

As the evidence in favor of a hypothesis (the thing again, not the word) accumulates to a convincing degree, we frequently symbolize the fact with term theory. Thus, semantically, a theory is the name of a hypothesis that has outgrown its experimental short pants. With Charles Darwin, biological evolution was a hypothesis; in contemporary science it is a theory that no rational observer, however cautious, hesitates to accept.

When predictions based on the implications of a theory are continually borne out by observation, the relation symbolized is still further elevated to the status of a law or natural law. The

abstraction "law" is a dangerous one to employ because it implies that the mind has finally arrived at the truth, ultimate and eternal. Thus, the eyes of science become myopic and lose the power to discover old errors and discern new truths.

Bacon's *Of Studies*

An essay which appeals chiefly to the intellect is Francis Bacon's *Of Studies*. His careful tripartite division of studies expressed succinctly in aphoristic prose demands the complete attention of the mind of the reader. He considers studies as they should be: for pleasure, for self-improvement, for business. He considers the evils of excess study: laziness, affectation, and preciosity. Bacon divides books into three categories: those to be read in part, those to be read cursorily, and those to be read with care. Studies should include reading, which gives depth; speaking, which adds readiness of thought; and writing, which trains in preciseness. Somewhat mistakenly, the author ascribes certain virtues to individual fields of study: wisdom to history, wit to poetry, subtlety to mathematics, and depth to natural philosophy. Bacon's four-hundred-word essay, studded with Latin phrases and highly compressed in thought, has intellectual appeal indeed.

Importance of Knowledge

For me, scientific knowledge is divided into mathematical sciences, natural sciences or sciences dealing with the natural world (physical and biological sciences), and sciences dealing with mankind (psychology, sociology, all the sciences of cultural achievements, every kind of historical knowledge). Apart from these sciences is philosophy, about which we will talk shortly. In the first place, all this is pure or theoretical knowledge, sought only for the purpose of understanding, in order to fulfill the need to understand that is intrinsic and consubstantial to man. What distinguishes man from animal is that he knows and needs to know. If man did not know that the world existed, and that the world was of a certain kind, that he was in the world and that he himself was of a certain kind, he wouldn't be man. The technical aspects of applications of knowledge are equally necessary for man and are of the greatest importance, because they also contribute to defining him as man and permit him to pursue a life increasingly more truly human.

But even while enjoying the results of technical progress, he must defend the primacy and autonomy of pure knowledge. Knowledge sought directly for its practical applications will have immediate and foreseeable success, but not the kind of important result whose revolutionary scope is in large part unforeseen, except by the imagination of the Utopians. Let me recall a well-known example. If the Greek mathematicians had not applied themselves to the investigation of conic sections, zealously and without the least suspicion that it might someday be useful, it would not have been possible centuries later to navigate far from shore. The first men to study the nature of electricity could not imagine that their experiments, carried on

because of mere intellectual curiosity, would eventually lead to modern electrical technology, without which we can scarcely conceive of contemporary life. Pure knowledge is valuable for its own sake, because the human spirit cannot resign itself to ignorance. But, in addition, it is the foundation for practical results that would not have been reached if this knowledge had not been sought disinterestedly.

Germania of Tacitus

For the classical scholar, the *Germania* of Tacitus is a minor work, forming with the *Agricola* a kind of prelude to the great works of Tacitus, the *Annals* and the *Histories*. However, for the student of the Germanic people, Tacitus' ethnographic treatise is a major source of information, mainly reliable, about the German tribes of the first century A.D.

Studies of Tacitus have often attempted to clarify the author's purpose in writing the *Germania* by defining it as an example of a particular literary genre. A few have seen the book primarily as a satire of Roman corruption, which uses the warlike but upright Germans as a stick with which to beat the degeneracy and vice Tacitus observed in his contemporary Rome; others classify the book as an extended political pamphlet whose central purpose is to urge the emperor Trajan to some decisive Roman action, possibly invasion, to destroy the growing threat posed by the German tribes.

Both these themes are present in the *Germania*, but they are not central to its purpose; if they were, Tacitus would certainly have made them more prominent and explicit. The book's real purpose is the obvious one – to explain as fully as possible to a Roman audience what was known of the customs and character of a significant neighboring people. In this task, Tacitus was following the examples of several earlier ethnographers, including Livy, whose *Histories* included an ethnographic study of the German people, and Seneca, who wrote lost works about the people of India and Egypt that may well have resembled the *Germania*. Such works formed the type to which the *Germania* belongs, and though most of the examples are lost, it seems to have been a recognized genre of the period.

However, as with most ethnographic studies to this day, the *Germania* reveals as much about the preoccupations of the society to which its author belonged as about the people who are the work's ostensible subject. Thus, the fear of a German threat to the security of Rome is reflected in the largely military orientation of the study. The picture Tacitus paints is of a thoroughly warlike people, a nation of men who will "transact no business, public or private, without being armed", a society that regards weapons as "the equivalent of the man's toga with us" – i.e., the Romans – "the first distinction publicly conferred upon a youth, who now ceases to rank merely as a member of a household and becomes a citizen". The Germans even applaud in assembly, not by clapping, but by clashing their spears. If Tacitus' aim was to arouse the concern of his audience over a German military threat, his choice of details surely advanced his purpose.

Thinking

No one can be a great thinker who does not realize that as a thinker it is her first duty to follow her intellect to whatever conclusions it may lead. Truth gains more even by the errors of one who, with due study and preparation, thinks for herself, than by the true opinions of those who only hold them because they do not suffer themselves to think. Not that it is solely, or chiefly, to form great thinkers that freedom of thinking is required. On the contrary, it is as much or even more indispensable to enable average human beings to attain the mental stature which they are capable of. There have been, and may again be, great individual thinkers in a general atmosphere of mental slavery. But there never has been, nor ever will be, in that atmosphere an intellectually active people. Where any people has made a temporary approach to such a character, it has been because the dread of heterodox speculation was for a time suspended. Where there is a tacit convention that principles are not to be disputed; where the discussion of the greatest questions which can occupy humanity is considered to be closed, we cannot hope to find that generally high scale of mental activity which has made some periods of history so remarkable. Never when controversy avoided the subjects which are large and important enough to kindle enthusiasm was the mind of a people stirred up from its foundations and the impulse given which raised even persons of the most ordinary intellect to something of the dignity of thinking beings.

She who knows only her own side of the case knows little of that. Her reasons may be good, and no one may have been able to refute them. But if she is equally unable to refute the reasons of the opposite side; if she does not so much as know what they are, she has no ground for preferring either opinion. The rational position for her would be suspension of judgment, and unless she contents herself with that, she is either led by authority, or adopts, like the generality of the world, the side to which she feels the most inclination. Nor is it enough that she should hear the arguments of adversaries from her own teachers, presented as they state them, and accompanied by what they offer as refutations. That is not the way to do justice to the arguments, or bring them into real contact with her own mind. She must be able to hear them from persons who actually believe them; who defend them in earnest, and do their very utmost for them. She must know them in their most plausible and persuasive form: she must feel the whole force of the difficulty which the true view of the subject has to encounter and dispose of; else she will never really possess herself of the portion of truth which meets and removes that difficulty. Ninety-nine in a hundred of what are called educated persons are in this condition; even of those who can argue fluently for their opinions. Their conclusion may be true, but it might be false for anything they know: they have never thrown themselves into the mental position of those who think differently from them and considered what such persons may have to say; and consequently they do not, in any proper sense of the word, know the doctrines which they themselves profess. They do not know those parts of the doctrine which explain and justify the remainder; the considerations which show that a fact which seemingly conflicts with another is reconcilable with it, or that, of two apparently strong reasons, one and not the other ought to be preferred.

The Polytheist

A polytheist always has favorites among the gods, determined by his own temperament, age, and condition, as well as his own interest, temporary or permanent. If it is true that everybody loves a lover, then Venus will be a popular deity with all. But from lovers she will elicit special devotion. In ancient Rome, when a young couple went out together to see a procession or other show, they would of course pay great respect to Venus, when her image appeared on the screen. Instead of saying, "Isn't love wonderful?" they would say, "Great are thou, O Venus." In a polytheistic society you could tell a good deal about a person's frame of mind by the gods he favored, so that to tell a girl you were trying to woo that you thought Venus overrated was hardly the way to win her heart. But in any case, a lovesick youth or maiden would be spontaneously supplicating Venus.

The Greeks liked to present their deities in human form; it was natural to them to symbolize the gods as human beings glorified, idealized. But this fact is also capable of misleading us. We might suppose that the ancients were really worshipping only themselves; that they were, like Narcissus, beholding their own image in a pool, so that their worship was *anthropocentric* (man-centered) rather than *theocentric* (god-centered). We are in danger of assuming that they were simply constructing the god in their own image. This is not necessarily so. The gods must always be symbolized in one form or another. To give them a human form is one way of doing this, technically called *anthropomorphism* (from the Greek *anthropos*, a man, and *mophe*, form). People of certain temperaments and within certain types of culture seem to be more inclined to it than are others. It is, however, more noticeable in others than in oneself, and those who affect to despise it are sometimes conspicuous for their addiction to it. A German once said an Englishman's idea of God is an Englishmen twelve feet tall. Such disparagement of anthropomorphism occurred in the ancient world, too. The Celts, for instance, despised Greek practice in this matter, preferring to use animals and other such symbols. The Egyptians favored more abstract and stylized symbols, among which a well-known example is the solar disk, a symbol of Rà, the sun-god.

Professor C.S. Lewis tells of an Oxford undergraduate he knew who, priggishly despising the conventional images of God, thought he was overcoming anthropomorphism by thinking of the Deity as infinite vapor or smoke. Of course even the bearded-old-man image can be a better symbol of Deity than ever could be the image, even if this were psychologically possible, of unlimited smog.

What is really characteristic of all polytheism, however, is not the worship of idols or humanity or forests or stars; it is, rather, the worship of innumerable powers that confront and affect us. The powers are held to be valuable in themselves; that is why they are to be worshipped. But the values conflict. The gods do not cooperate, so you have to play them off against each other. Suppose you want rain. You know of two gods, the dry-god who sends drought and the wet-god who sends rain. You do not suppose that you can just pray to the wet-god to get busy, and simply

ignore the dry-god. If you do so, the latter may be offended, so that no matter how hard the wet-god tries to oblige you, the dry-god will do his best to wither everything. Because both gods are powerful you must take into consideration, begging the wet-god to be generous and beseeching the dry-god to stay his hand.

Bible and Theatre

Morally and culturally, American society, as reflected in our TV programs, our theatrical fare, our literature and art appears to have hit bottom.

Gen. David Sarnoff felt prompted to issue a statement in defense of the TV industry. He pointed out that there was much good in its programs that was being overlooked while its occasional derelictions were being overly stressed. It struck me that what he was saying about TV applied to other aspects of American culture as well, particularly to the theatrical productions.

Without necessarily resting on his conviction that the good outweighed the bad in American cultural activity, I saw further implications in Gen. Sarnoff's declaration. Audiences needed to be sensitized more and more to the positive qualities of the entertainment and cultural media. In addition, through such increased public sensitivity, producers would be encouraged to provide ever more of the fine, and less of the sordid.

Here is where questions arise. If the exemplary aspects of TV are not being recognized, what is the reason for such a lack of appreciation? Similarly, and further, if the theatre, including in this term the legitimate stage, on and off Broadway as well as the moving pictures, has large measures of goodness, truth and beauty which are unappreciated, how are we to change this situation?

All in all, what should be done to encourage and condone the good, and to discourage and condemn the unsavory in the American cultural pattern?

These are serious and pressing questions – serious for the survival of the American Way of Life, and pressing for immediate and adequate answers. Indeed the simple truth is that the face that American shows the world affects seriously the future of democracy all over the globe.

Since the theatre in its broadest sense is a large aspect of American culture – its expression as well as its creation – I saw the urgent importance of bringing the worthwhile elements in the American Theatre to the fore. Especially was this importance impressed on me when I realized how much Hollywood was involved in exporting American life to the world, and how much Broadway with all its theatres means to the modern drama.

Then the thought of the Bible came to me in this connection. Was not the Bible the basis of Western civilization as far as morals are concerned? Why not use the Bible as guide and

touchstone, as direction and goal in the matter of the cultural achievements of Western society? Thus was born "The Bible on Broadway".

The birth of the idea accomplished, rearing it brought the usual difficulties of raising a child – albeit in this case a "brain" one. There was first the fact that the Bible, although the world's best seller, is not the world's best read book. Second was the current impression that "message-plays" must necessarily be dull and unpopular ...

Still, I was drawn to the project of a series of lectures on the Bible and the contemporary theatre. What if the Bible is not well known? Teach it! Plays with a message dull? All plays by reason of their being works of art have been created by their authors' selection and ordering of experience. As such, plays are proponents of ideas – and certainly they are not meant to be uninteresting ...

That there are spiritual, even religious ideas, in the contemporary theatre should be no cause for wonderment. It is well known that the drama had its origin in religion. The Greeks, the Romans, as well as the early Hebrews, all had forms of the drama which among the first two developed into our classical plays.

In the Middle-Ages, it was the Church in the Western World that produced the morality and mystery plays. With such a long history it is not surprising to find an affinity between the Bible and the Theatre.

Philosophy Fallen on Hard Times

Although the number of journals has never been greater and the flyers announcing new conferences, colloquia, and societies never as ambitious, it is no secret that something is wrong with philosophy in the English-speaking world. The advances made by Russell, Whitehead, Wittgenstein, and Husserl are now studied by historians, and the boldness which characterized their age, roughly from 1900 to 1950, has given way to a spirit of caution, qualification, and retreat. This is not to say that talented people no longer study philosophy, nor that worthwhile contributions have ceased. Promising work is being done, but too often it is overwhelmed by pettifogging or left to die in obscurity.

Those unaware of what is happening in philosophy today may be surprised to learn that few academic philosophers address the sort of problems one studied in college: death, the existence of God, the cardinal virtues, the external world, or the prospects for happiness. Instead, if one walks into a classroom or lecture hall, one is likely to find brief discussions dealing with an old assortment of issues about such things as time machines, adverbs, pains, possible worlds, sexual perversion. Even the language has changed. In many cases, English prose has been replaced by codes, symbols, and dialects incomprehensible to those outside the profession and not much better known to some of those inside.

It is not altogether surprising that philosophy has fallen on hard times. Throughout much of this century, people believed that philosophical questions were the result of logical or linguistic confusions. The task of philosophy was to eliminate them and thereby do away with itself ...

The problem is that philosophy is unique among academic disciplines in that the philosopher is forever plagued by the question of what his discipline is about ... A beginning student is usually told that philosophy does not deal with facts but with the analysis of concepts. But this characterization is inadequate because it seems to suggest that the distinction between factual and the conceptual is absolute and that concepts can be analyzed entirely on their own. The philosopher, in other words, need not bother with what is, has been, or is likely to be the case.

What emerges is a conception of philosophy that retains its purity by making a radical distinction between itself and virtually every other form of knowledge. C.D. Broad once described philosophy at Cambridge as "almost completely out of touch with general history, with political theory and sociology, and with jurisprudence". Few eyebrows would have been raised if he had thrown in a dozen other departments and perhaps three or four additional disciplines as well. As for how it is possible to do, say, ethics in such an environment, Broad and his cohorts had a ready answer: the moral philosopher must be distinguished from the moralist. The latter takes a stand on important ethical questions and can be refuted should his evidence prove insufficient. For him to be ignorant of history, political theory, and jurisprudence is to run the risk of being wrong. The moral philosopher, however, only reflects on the language employed by the moralist. Since the philosopher is not in the business of recommending or criticizing courses of action, he can comfortably ignore the lessons the moralist has to learn.

This conception of philosophy prevailed in the English-speaking world for about forty years until it fell into disrepute during the turmoil of the sixties. Then sticky questions began to be asked: To whom was such analysis addressed and for what purpose? If the moral philosopher had studied the great ethical system of the past, why should he not bring his knowledge to bear on the controversial issues of the present? Recently a number of articles have sprung up in the philosophical journals dealing with abortion, homosexuality, recombinant DNA research, intelligence testing, and other issues once thought to be beyond the scope of philosophical inquiry. Their presence raises the obvious question: What unique subject or set of problems distinguishes philosophical inquiry from everything else?

One difficulty is that while other disciplines investigate a specific range of phenomena, philosophy, particularly in the hodgepodge conception of it, investigates all of existence. Worse, while the natural sciences seem to get better as they get older, philosophy does not. Without a body of accepted beliefs to build on, philosophers can make interesting points, but not step-by-step progress. A researcher in physics does not have to make a new beginning each time he walks into his lab; he can assume that there is a consensus on a large number of issues and thus can direct his efforts to a few highly restricted problems.

Existentialism

There are many dictionary definitions of "existentialism". Central to each definition, however, is the assertion that existentialism is a theory or statement about the nature of man's existence. Existentialism is one of a limited number of views of man's nature, in which existence is all-important. The other views are that man's nature is one that falls into one of the following categories: an operational balance among the elements of thought, feeling, and sensation – classicism; an imbalance weighted in favor of the world of volition's (feeling, emotions, and will) over the world of mind and senses – romanticism; an imbalance among the categories of head, heart, and hand in favor of thought – rationalism; an imbalance resulting from choosing the world of materiality, the world of the senses and things, over the claims of spirit and thought – naturalism.

Existentialism is a view of human existence in the class with classicism, romanticism, rationalism, and naturalism. Obviously, for each individual, the meanings of each view must be carried by words which have ranges of meaning. If we can find one of the views which differs from all other views in accepting a range of meaning, then the view can be defined at least from a semantic point of view. Whether one is a romanticist, a rationalist, a classicist, or one in the grim hold of naturalism, he accepts words describing each as holding the same range of meaning for all views, even including that of existentialism. He accepts the range of meanings describing each one, although he selects from the range according to his unique viewpoint. However, since the existentialist denies that he can be bound to the external control of any range of meanings, including those of words, he can be defined as uniquely different from his *philosophers*. Here, the definition, and an effective one, is on semantical grounds. He creates his own range of meanings of words; if they approach those used in the other philosophies of man's existence, they do so accidentally. The existentialist deliberately – and unconsciously sometimes – rejects traditional ranges of meaning in his own language environment. Quite often he does so through using the words in an opposite sense. We could rest on this linguistic view, and do so safely, did we so desire. However, we can also define existentialism in the light of a historical uniqueness.

Philosophy

In a sense, no intelligent person in his lifetime can entirely escape at least some informal speculation. In the form of a dilemma, Aristotle presented this truth in the fragment of one of his lost treatises, *Protreptikos*: "You say one must philosophize. You say one should not philosophize. Then to prove your contention you must philosophize. In any case you must philosophize." To abandon philosophy altogether is itself a philosophical decision. In spite of some incurious or inept minds, the human intellect is naturally philosophical; it has a quenchless thirst for knowledge, not merely for data but for their explorations, justifications, and proofs; it tries to grasp its findings in an ultimate understanding of reality. Man's search is always for truth; he even proves truth by truth. In a popular sense, every thinking person is philosophizing. Philosophy in the strict, technical sense, however, is quite different from the popular use of the term. The philosophizing of the common man is superficial, vague, haphazard, unconscious,

uncritical, and subjective; but philosophy in the strict sense is a conscious, precise, critical, objective, and systematic study of all things.

Etymologically, the term "philosophy" derives from two Greek words: *philia* ("love") and *sophia* ("wisdom"). Originally the term *sophia* designated the carpenter's art, the art of navigation and guessing riddles. Later it meant talent in poetry and excellence in any art, music in particular. In ancient Greece a wise man was a person characterized by common sense or by great skill and outstanding performance in any art. Not until the time of Aristotle, though, did the term "philosophy" assume a technical meaning, distinguishing it from other branches of learning.

The main objects of philosophy, those that best indicate its meaning, are speculation and criticism. Concerning speculation, philosophy looks upon things from the broadest possible perspective; as for criticism, it has the twofold role of questioning and judging everything that pertains either to the foundations or to the superstructure of human thinking. [It is interesting to note that the English word "speculation" comes from the Latin verb *specere* ("to see"), but its immediate origin is in the noun *specula*, indicating a "watch tower" or, metonymically, a "hill". Just as one can see the wide horizon from a tower or a hilltop, so he obtains through philosophy a broad view of reality.] In short, philosophy is the science of beings in search of their ultimate reasons, causes, and principles. As a science of beings, philosophy is concerned with everything that is or becomes or is known. Whereas the special sciences are looking for the proximate cause of things, philosophy searches for the ultimate explanations and causes of being.

Paganism

The paganism of the Greeks and Romans, though a religion without salvation or afterlife, was not necessarily indifferent to man's moral behavior. What has misled some historians is that this religion, without theology or church, was, if I may put it this way, more an a la carte religion than a religion with a fixed menu. If an established church is a "one-party state", then paganism was "free enterprise". Each man was free to found his own temple and preach whatever god he liked, just as he might open a new inn or peddle a new product. And each man made himself the client of whichever god he chose, not necessarily his city's favorite deity: the choice was free.

Such freedom was possible because between what the pagans meant by "god" and what Jews, Christians, and Moslems mean, there is little in common but the name. For the three religions of the Book, God is infinitely greater than the world which he created. He exists solely as an actor in a cosmic drama in which the salvation of humankind is played out. The pagan gods, by contrast, live their lives and are not confined to a metaphysical role. They are part of this world, one of three races that populate the earth: animals, which are neither immortal nor gifted with reason; humans, who are mortal but reasonable; and gods, who are immortal and reasonable. So true is it that the divine race is an animal genus that every god is either male or female. From this it follows that the gods of all peoples are true gods. Other nations might worship gods unknown to the Greeks and Romans, or they might worship the same gods under different names. Jupiter

was Jupiter the world over, just as a lion is a lion, but he happened to be called Zeus in Greek, Taranis in Gallic, and Yao in Hebrew. The names of the gods could be translated from one language to another, just like the names of planets and other material things. Belief in alien gods foundered only where it was the product of an absurd superstition, something that smacked of a fantastic bestiary. The Romans laughed at the gods with animal bodies worshipped by the Egyptians. In the ancient world religious people were as tolerant of one another as are Hindu sects. To take a special interest in one god was not to deny the others.

This fact was not without consequence for man's idea of his own place in the natural order. Imagine a circle, which represents the world according to the religious of the Book. Given man's importance in the cosmic drama, he occupies at least half the circle. What about God? He is so exalted, so awesome, that he remains far above the circle. To represent him, draw an arrow, pointing upward from the center of the circle and mark it with the sign of infinity. Now consider the pagan world. Imagine a sort of staircase with three steps. On the lowest step stand the animals; on the next step, humans; and on the third step, the gods. In order to become a god, one did not need to rise very far. The gods stood just above humans, so that it often makes sense to translate the Latin and Greek words for "divine" as "superhuman".

The Use of Pure Knowledge

The word *science* is heard so often in modern times that almost everybody has some notion of its meaning. On the other hand, its definition is difficult for many people. The meaning of the term is confused because many endeavors masquerading under the name of science do not have any valid connection with it. Therefore everyone should understand its import and objectives. Just to make the explanation as simple as possible, suppose science is defined as classified knowledge (facts). An example that adequately meets the requirements is astronomy. On the other hand, astrology, regardless of how sincerely it is believed by some, must be excluded since it is not based on fact. Even in the true sciences distinguishing fact from fiction is not always easy. For this reason great care should be taken to distinguish between beliefs and truths. There is no danger as long as a clear difference is made between temporary and proved explanations. For example, hypotheses (tentative theories) and theories are attempts to explain natural phenomena. From these tentative positions the scientist continues to experiment and observe until they are proved or discredited. The exact status of any explanation should be clearly labeled to avoid confusion.

The objectives of science are primarily the discovery and the subsequent understanding of the unknown. Man cannot be satisfied with recognizing that secrets exist in nature or that questions are unanswerable; he must solve them. Toward that end specialists in the field of biology and related fields of interest are directing much of their time and energy. A beginning student should understand the motivation of science and acquire the spirit of inquiry. That kind of spirit, plus practice in the methods of science, should make a course more meaningful.

Actually, two basic approaches lead to the discovery of new information. One, aimed at satisfying curiosity, is referred to as pure science. The other is aimed at using knowledge for specific purposes – for instance, improving health, raising standards of living, or creating new consumer products. In this case knowledge is put to economic use. Such an approach is referred to as applied science.

Sometimes practical-minded people miss the point of pure science in thinking only of its immediate utilization for economic rewards. One can see that an extraordinary amount of knowledge about chemistry is necessary before one can possibly understand functions of protoplasm like respiration or photosynthesis. Chemists responsible for many of the discoveries could hardly have anticipated that their findings would one day result in applications of such a practical nature as those directly related to life and health. Furthermore, geneticists working on insects could not foresee all the possible applications of their findings to the improvement of plants and animals through selective breeding. The discovery of one bit of information opens the door to the discovery of another. Some discoveries seem so simple that one is amazed they were not made years ago; however, one should remember that the construction of the microscope had to precede the discovery of the cell, and a knowledge of the chemical nature of oxygen and carbon dioxide had to come before a breakthrough in the understanding of photosynthesis. The host of scientists dedicating their lives to pure science are not apologetic about ignoring the practical side of their discoveries; they know from experience that most knowledge is eventually applied. Probably one can safely say that even from a practical point of view all discoveries will eventually be used.

Maritain's Philosophy

In *Scholasticism and Politics*, written during World War II, Maritain expressed discouragement at the pessimism and lack of self-confidence characteristic of the Western democracies, and in the postwar world he joined enthusiastically in the resurgence of that confidence. While stopping short of asserting that democracy as a political system flowed directly from correct philosophical principles, he nonetheless dismissed Fascism and Communism as inherently irrational. Bourgeois individualism was, however, implicitly immoral and, by breaking down all sense of community and shared moral values, would inevitably end in some form of statism: order imposed from above. In *Integral Humanism* (1936) and later works, he developed a systematic critique of the prevailing modern political ideologies and argued that a workable political order, which might appropriately be democracy, depended on a correct understanding of human nature and of natural moral law.

Maritain became something of an Americanophile, seeking to counter not only what he regarded as European misconceptions about America but also the Americans' own self-deprecation. In *Reflections on America* (1958), he argued that Americans were not really materialistic but were the most idealistic people in the world, although theirs was an idealism often unformed and lacking in philosophical bases. America, he thought, offered perhaps the best contemporary

prospect for the emergence of a truly Christian civilization, based not on governmental decree but on the gradual realization of Christian values on the part of a majority of the population. American saints were coming, he predicted.

But his postulation of a possible Christian civilization in America did not in any way temper his optimistic political liberalism – a facet of his thought which caused him to be held in suspicion by some of his fellow Catholics in the 1950s. The Dominican chaplain at Princeton, for example, refused to allow him to address the Catholic students. (One of the exquisite ironies of recent Catholic history was that Maritain in his last books was acerbically critical of secularizing priests, while the Dominican chaplain resigned from the priesthood and ended his days as real estate salesman in Florida.)

No doubt in part because of Raïssa's background, Maritain had an enduring interest in anti-Semitism, which he analyzed and criticized in two books, and he was one of the principal influences in the effort to establish better Jewish-Catholic relations. Racism he regarded as America's most severe flaw. As early as 1958 he was praising Martin Luther King, Jr., and the Chicago neighborhood organizer Saul Alinsky.

Maritain and, to a lesser extent, Gilson provided the program for a bold kind of Catholic intellectuality – an appropriation of medieval thought for modern use, not so much a medieval revival as a demonstration of the perennial relevance of the medieval philosophical achievement. The modern mind was to be brought back to its Catholic roots, not by the simple disparagement of modernity or by emphasis on the subjective necessity of faith, but by a rigorous and demanding appeal to reason. In the process, Scholastic principles would be applied in new and often daring ways.

In the end the gamble failed. Despite promising signs in the 1940s, secular thinkers did not finally find the scholastic appeal persuasive. And, as is inevitable when an intellectual community is dominated so thoroughly by a single system of thought, a restiveness was building up in Catholic circles. Although Maritain insisted that Thomism, because of the central importance it gave to the act of existence, was the true existentialism, Catholic intellectuals of the 1950s were attracted to the movement which more usually went by that name; and Gabriel Marcel, a Catholic existentialist of the same generation as Gilson and Maritain, was available to mediate between faith and anguish. Catholic colleges in America were hospitable to existentialist and phenomenological currents at a time when few secular institutions were, and what Catholics sought there was primarily a philosophy which was serious about the metaphysical questions of existence, yet not as rationalistic, rigid, and abstract as scholasticism often seemed to be.

English Hierarchy

Having rejected Catholicism, English society after the Protestant Reformation felt compelled to impose new order on an uncertain universe. Claiming knowledge of a divine plan which linked

the celestial and natural worlds into one "great chain of being," some English thinkers depicted humans as the highest link on that portion of the chain belonging to the natural world, and human society, in turn, as comprising a series of vertical political hierarchies. Echoing the assertion of Elizabeth to a rebellious Parliament that "the feet do not rule the head", Edward Forset in 1606 elaborated one hierarchy in which the body was topped, literally and morally, by head and soul. In Forset's scheme both soul and monarchy possessed "unity" or "indivisibility", each uniting and reigning over subordinate links contained in their respective segments of the worldly chain. Given popular acceptance of the idea of stability as God's will, Elizabeth and her immediate successors possessed a potent, though short-lived, ideological restraint.

Du Bois

Given the persistent and intransigent nature of the American race system, which proved quite impervious to black attacks, Du Bois in his speeches and writings moved from one proposed solution to another, and the salience of various parts of his philosophy changed as his perceptions of the needs and strategies of black American shifted over time. Aloof and autonomous in his personality, Du Bois did not hesitate to depart markedly from whatever was the current mainstream of black thinking when he perceived that the conventional wisdom being enunciated by black spokesmen was proving inadequate to the task of advancing the race. His willingness to seek different solutions often placed him well in advance of his contemporaries, and this, combined with a strong-willed, even arrogant personality made his career as a black leader essentially a series of stormy conflicts.

Thus Du Bois first achieved his role as a major black leader in the controversy that arose over the program of Booker T. Washington, the most prominent and influential black leader at the opening of the twentieth century. Amidst the wave of lynchings, disfranchisement, and segregation laws, Washington, seeking the good will of powerful whites, taught blacks not to protest against discrimination, but to elevate themselves through industrial education, hard work, and property accumulation; then, they would ultimately obtain recognition of their citizenship rights. At first Du Bois agreed with this gradualist strategy, but in 1903 with the publication of his most influential book, *Souls of Black Folk*, he became the chief leader of the onslaught against Washington that polarized the black community into two wings – the "conservative" supporters of Washington and his "radical" critics.

America and World War Two

The establishment of the Third Reich influenced events in American history by starting a chain of events which culminated in war between Germany and the United States. The complete destruction of democracy, the persecution of Jews, the war on religion, the cruelty and barbarism of the Nazis, and especially, the plants of Germany and her allies, Italy and Japan, for world

conquest caused great indignation in this country and brought on fear of another world war. While speaking out against Hitler's atrocities, the American people generally favored isolationist policies and neutrality. The Neutrality Acts of 1935 and 1936 prohibited trade with any belligerents or loans to them. In 1937 the President was empowered to declare an arms embargo in wars between nations at his discretion.

American opinion began to change somewhat after President Roosevelt's "quarantine the aggressor" speech at Chicago (1937), in which he severely criticized Hitler's policies. Germany's seizure of Austria and the Munich Pact for the partition of Czechoslovakia (1938) also aroused the American people. The conquest of Czechoslovakia in March 1939 was another rude awakening to the menace of the Third Reich. In August 1939 came the shock of the Nazi-Soviet Pact and in September the attack on Poland and the outbreak of European war. The United States attempted to maintain neutrality in spite of sympathy for the democracies arrayed against the Third Reich. The Neutrality Act of 1939 repealed the arms embargo and permitted "cash and carry" exports of arms to belligerent nations. A strong national defense program was begun. A draft act was passed (1940) to strengthen the military services. A Lend-Lease Act (1941) authorized the president to sell, exchange, or lend materials to any country deemed necessary by him for the defense of the United States. Help was given to Britain by exchanging certain overage destroyers for the right to establish American bases in British territory in the Western Hemisphere. In August 1941 President Roosevelt and Prime Minister Churchill met and issued the Atlantic Charter, which proclaimed the kind of a world that should be established after the war. In December 1941 Japan launched an unprovoked attack on the United States at Pearl Harbor. Immediately thereafter, Germany declared war on the United States.

Iroquois

The stability that had marked the Iroquois Confederacy's generally pro-British position was shattered with the overthrow of James II in 1688, the colonial uprisings that followed in Massachusetts, New York, and Maryland, and the commencement of King William's War against Louis XIV of France. The increasing French threat to English hegemony in the interior of North America was signalized by French-led or French-inspired attacks on the Iroquois and on outlying colonial settlements in New York and New England. The high point of the Iroquois response was the spectacular raid of August 5, 1689, in which the Iroquois virtually wiped out the French village of Lachine, just outside Montreal. A counterraid by the French on the English village of Schenectady in March, 1690, instilled an appropriate measure of fear among the English and their Iroquois allies.

The Iroquois position at the end of war, which was formalized by treaties made during the summer of 1701 with the British and the French, and which was maintained throughout most of the eighteenth century, was one of "aggressive neutrality" between the two competing European powers. Under the new system the Iroquois initiated a peace policy toward the "far Indians", tightened their control over the nearby tribes, and induced both English and French to support

their neutrality toward the European powers by appropriate gifts and concessions.

By holding the balance of power in the sparsely settled borderlands between English and French settlements, and by their willingness to use their power against one or the other nation if not appropriately treated, the Iroquois played the game of European power politics with effectiveness. The system broke down, however, after the French became convinced that the Iroquois were compromising the system in favor of the English and launched a full-scale attempt to establish French physical and juridical presence in the Ohio Valley, the heart of the borderlands, long claimed by the Iroquois. As a consequence of the ensuing Great War for Empire, in which Iroquois neutrality was dissolved and European influence moved closer, the play-off system lost its efficacy and a system of direct bargaining supplanted it.

The Constitutional Convention

The delegates to the Constitutional Convention were realists. They knew that the greatest battles would take place after the convention, once the Constitution had already been drafted and signed. The delegates had overstepped their bounds. Instead of amending the Articles of Confederation by which the American states had previously been governed, they had proposed an entirely new government. Under these circumstances, the convention was understandably reluctant to submit its work to the Congress for approval.

Instead, the delegates decided to pursue what amounted to a revolutionary course. They declared that ratification of the new Constitution by nine states would be sufficient to establish the new government. In other words, the Constitution was being submitted directly to the people. Not even the Congress, which had called the convention, would be asked to approve its work.

The leaders of the convention shrewdly wished to bypass the state legislatures, which were attached to states rights and which required in most cases the agreement of two houses. For speedy ratification of the Constitution, the single-chambered, specially elected state ratifying conventions offered the greatest promise of agreement.

Battle lines were quickly drawn. The Federalists, as the supporters of the Constitution were called, had one solid advantage: they came with a concrete proposal. Their opponents, the Antifederalists, came with none. Since the Antifederalists were opposing something with nothing, their objections, though sincere, were basically negative. They stood for a policy of drift while the Federalists were providing clear leadership.

Furthermore, although the Antifederalists claimed to be the democratic group, their opposition to the Constitution did not necessarily spring from a more democratic view of government. Many of the Antifederalists were as distrustful of the common people as their opponents. In New York, for example, Governor George Clinton criticized the people for their fickleness and their tendency to "vibrate from one extreme to another". Elbridger Gerry of Massachusetts, who

refused to sign the Constitution, asserted that "the evils we experience flow from the excess of democracy", and John F. Mercer of Maryland professed little faith in his neighbors as voters when he said that "the people cannot know and judge the character of candidates".

The US Military

The National Security Act of 1947 created a national military establishment headed by a single Secretary of Defense. The legislation had been a year-and-a-half in the making – beginning when President Truman first recommended that the armed services be reorganized into a single department. During that period the President's concept of a unified armed service was torn apart and put back together several times, the final measure to emerge from Congress being a compromise. Most of the opposition to the bill came from the Navy and its numerous civilian spokesmen, including Secretary of the Navy James Forrestal. In support of unification (and a separate air force that was part of the unification package) were the Army air forces, the Army, and, most importantly, the President of the United States.

Passage of the bill did not bring an end to the bitter interservice disputes. Rather than unify, the act served only to federate the military services. It neither halted the rapid demobilization of the armed forces that followed World War II nor brought to the new national military establishment the loyalties of officers steeped in the traditions of the separate services. At a time when the balance of power in Europe and Asia was rapidly shifting, the services lacked any precise statement of United States foreign policy from the National Security Council on which to base future programs. The services bickered unceasingly over their respective roles and missions, already complicated by the Soviet nuclear capability that for the first time made the United States subject to devastating attack. Not even the appointment of Forrestal as First Secretary of Defense allayed the suspicions of naval officers and their supporters that the role of the U.S. Navy was threatened with permanent eclipse. Before the war of words died down, Forrestal himself was driven to resignation and then suicide.

By 1948, the United States military establishment was forced to make do with a budget approximately 10 percent of what it had been at its wartime peak. Meanwhile, the cost of weapons procurement was rising geometrically as the nation came to put more and more reliance on the atomic bomb and its delivery system. These two factors inevitably made adversaries of the Navy and the Air Force as the battle between advocates of the B-36 and the supercarrier so amply demonstrates. Given severe fiscal restraints on the one hand, and on the other the nation's increasing reliance on strategic nuclear deterrence, the conflict between these two services over roles and missions was essentially a contest over slices of an ever-diminishing pie.

Yet if in the end neither service was the obvious victor, the principle of civilian dominance over the military clearly was. If there had ever been any danger that the United States military establishment might exploit, to the detriment of civilian control, the goodwill it enjoyed as a result of its victories in World War II, that danger disappeared in the interservice animosities

engendered by the battle over unification.

Indian Caste

The Hindu conception of society was static and was dominated by the idea of caste. The traditional fourfold order of priests, soldiers and administrators, merchants and agriculturalists, and menial workers not only was considered to be absolute, fundamental and necessary to society but also was given a divine sanction by being considered a creation of God (Brahma). According to this view, people born into the different castes had certain biologically inherited aptitudes that eminently fitted them to perform the caste functions it was their duty to perform.

Against this should be set the dynamic evolutionary conception of society as pictured in early Buddhism. Here the fourfold order was not considered absolute because, as the Buddha said, in certain societies there are only two classes – the lords and the serfs, or the masters and the slaves – and their division is not a rigid one since "the masters sometimes become slaves and the slaves, masters". Nor is caste divine in origin. The belief that caste was a creation of God and that the Brahmans, Hindus of the highest priestly caste, were the chosen children of God, a conception as old as the Rigveda, is denied in the Buddhist texts. In place of the conception of a divinely ordained fourfold order, Buddhism conceived of caste divisions as occupational divisions that arose owing to historical circumstances and considered the perpetuation of caste prejudice and discrimination as being due largely to the sanctions given them by the early Brahmans.

This is well brought out in the story of Devala the Dark, a well-known priest who was scorned because of his color by the other priestly seers, who were said, in the words of the Buddha, to have gotten together and formulated the "false and evil view" (papakam ditthigatam) that "the Brahmans alone were saved while the others were not". If this legend contains a germ of historical truth, then, in the words of Ghurye, "Caste in India must be regarded as a Brahmanic child of the Indo; Aryan culture, cradled in the land of the Ganges and thence transferred to the other parts of India."

Chile

Chile's human history apparently began about 10,000 years ago when migrating Indians followed the line of the Andes and settled in fertile valleys and along the coast. The Incas briefly extended their empire into the north, but the area's remoteness prevented any significant effect. In 1541, the Spanish, under Pedro de Valdivia, encountered about one million Indians from various cultures who supported themselves primarily through slash-and-burn agriculture and hunting. Although the Spaniards did not find the gold and silver they had sought there, they recognized the agricultural potential of Chile's central valley, and Chile became part of the Viceroyalty of Peru.

Chilean colonial society was heavily influenced by the latifundio system of large landholdings, kinship politics, the Roman Catholic Church, and an aggressive frontier attitude stemming from Indian wars. The drive for independence from Spain was precipitated by usurpation of the Spanish throne by Napoleon's brother Joseph. A national junta in the name of Ferdinand – heir to the deposed king – was formed on September 18, 1810. Spanish attempts to reimpose arbitrary rule during the Reconquista led to a prolonged struggle under Bernardo O'Higgins, Chile's most renowned patriot. Chilean independence was formally proclaimed on February 12, 1818.

The political revolution brought little social change, however, and 19th century Chilean society preserved the essence of the stratified colonial social structure. The system of presidential absolutism eventually predominated, but the wealthy land owners continued to control Chile. Although Chile established a representative democracy in the early 20th century, it soon became unstable and degenerated into a system protecting the interests of the ruling oligarchy. By the 1920s, the newly emergent middle and working classes were powerful enough to elect a reformist president, but his program was frustrated by a conservative congress. Continuing political and economic instability resulted in the quasidictatorial rule of General Carlos Ibanez (1924-1932).

After constitutional rule was restored in 1932, a strong middle-class party, the Radicals, formed. The Radical Party became the key force in coalition governments for the next 20 years. The 1920s saw the emergence of Marxist groups with strong popular support. During the period of Radical Party dominance (1932-1952), the state increased its role in the economy. However, presidents generally were more conservative than the parties supporting them, and conservative political elements continued to exert considerable power through their influence over the economy and control of rural voters.

Women's Movement

Although the study of women's history has only been developed as an academic discipline in the last twenty years, it is not the case that the current wave of feminist activity is the first in which interest in women's past was manifest. From its very beginnings, the nineteenth-century English women's movement sought to expand existing knowledge of the activities and achievements of women in the past. At the same time, like its American counterpart, the English women's movement had a powerful sense of its own historic importance and of its relationship to wider social and political change.

Nowhere is this sense of the historical importance – and of the historical connections between the women's movement and other social and political development – more evident than in Ray Strachey's classic account of the movement, *The Cause*. "The true history of the Women's Movement", Strachey argues, "is the whole history of the nineteenth century." The women's movement was part of the broad sweep of liberal and progressive reform which was transforming

society. Strachey emphasized this connection between the women's movement and the broader sweep of history by highlighting the importance for it of the Enlightenment and the Industrial Revolution. The protest made by the women's movement at the confinement and injustices faced by women was, in Strachey's view, part of the liberal attack on traditional prejudices and injustice. This critique of women's confinement was supplemented by the demand for recognition of women's role in the public, particularly the philanthropic realm. Indeed, it was the criticism of the limitations faced by women on the one hand, and their establishment of a new public role on the other hand, which provided the core of the movement, determining also its form: its organization around campaigns for legal, political and social reform.

Strachey's analysis was a very illuminating one, nowhere more so than in her insistence that, despite their differences and even antipathy to each other, both the radical Mary Wollstonecraft and evangelical Hannah More need to be seen as forerunners of the mid-Victorian feminism. At the same time, she omitted some issues which now seem crucial to any discussion of the context of Victorian feminism. Where Strachey pictured a relatively fixed image of domestic women throughout the first half of the nineteenth century, recent historical and literary works suggest that this image was both complex and unstable. The establishment of a separate domestic sphere for women was but one aspect of the enormous change in sexual and familial relationships which were occurring from the late eighteenth century through to the mid nineteenth. These changes were accompanied by both anxiety and uncertainty and by the constant articulation of women's duty in a new social world.

American Negro

The beginning of what was to become the United States was characterized by inconsistencies in the values and behavior of its population, inconsistencies that were reflected by its spokesmen, who took conflicting stances in many areas; but on the subject of race, the conflicts were particularly vivid. The idea that the Caucasian race and European civilization were superior was well entrenched in the culture of the colonists at the very time that the "egalitarian" republic was founded. Voluminous historical evidence indicates that, in the mind of the average colonist, the African was a heathen, he was black, and he was different in crucial philosophical ways. As time progressed, he was also increasingly captive, adding to the conception of deviance. The African, therefore, could be justifiably (and even philanthropically) treated as property according to the reasoning of slave traders and slaveholders.

Although slaves were treated as objects, bountiful evidence suggests that they did not view themselves similarly. There are many published autobiographies of slaves, and Afro-American scholars are beginning to know enough about West African culture to appreciate the existential climate in which the early captives were raised and which, therefore, could not be totally destroyed by the enslavement experience. This was a climate that defined individuality in collective terms. Individuals were inherently a part of the natural elements on which they depended, and they were actively related to those tribal members who once lived and to those not

yet born.

The colonial plantation system that was established and into which Africans were thrust did virtually eliminate tribal affiliations. Individuals were separated from kin; interrelationships among kin kept together were often transient because of sales. A new identification with those slaves working and living together in a given place could satisfy what was undoubtedly a natural tendency to be a member of a group. New family units became the most important attachments of individual slaves. Thus, as the system of slavery was gradually institutionalized, West African affiliation tendencies adapted to it.

This exceedingly complex dual influence is still reflected in black community life, and the double consciousness of black Americans is the major characteristic of Afro-American mentality. Du Bois articulated this divided consciousness as follows:

The history of the American Negro is the history of this strife – this longing to attain self-conscious manhood, to merge his double self into a better and truer self. In this merging, he wishes neither of the older selves to be best.

Several black political movements have looked upon this duality as destructively conflictual and have variously urged its reconciliation. Thus, the integrationists and the black nationalists, to be crudely general, have both been concerned with resolving the conflict, but in opposite directions.

Mary Bethune

Like her white friends Eleanor Roosevelt and Aubrey Williams, Mary Bethune believed in the fundamental commitment of the New Deal to assist the black American's struggle and in the need for blacks to assume responsibilities to help win that struggle. Unlike those of her white liberal associates, however, Bethune's ideas had evolved out of a long experience as a "race leader". Founder of a small black college in Florida, she had become widely known by 1935 as an organizer of black women's groups and as a civil and political rights activist. Deeply religious, certain of her own capabilities, she held a relatively uncluttered view of what she felt were the New Deal's and her own people's obligations to the cause of racial justice. Unafraid to speak her mind to powerful whites, including the President, or to differing black factions, she combined faith in the ultimate willingness of whites to discard their prejudice and bigotry with a strong sense of racial pride and commitment to Negro self-help.

More than her liberal white friends, Bethune argued for a strong and direct black voice in initiating and shaping government policy. She pursued this in her conversations with President Roosevelt, in numerous memoranda to Aubrey Williams, and in her administrative work as head of the National Youth Administration's Office of Negro Affairs. With the assistance of Williams, she was successful in having blacks selected to NYA posts at the national, state, and local levels. But she also wanted a black presence throughout the federal government. At the beginning of the

war she joined other black leaders in demanding appointments to the Selective Service Board and to the Department of the Army; and she was instrumental in 1941 in securing Earl Dickerson's membership on the Fair Employment Practices Committee. By 1944, she was still making appeals for black representation in "all public programs, federal, state, and local", and "in policy-making posts as well as rank and file jobs".

Though recognizing the weakness in the Roosevelt administration's response to Negro needs, Mary Bethune remained in essence a black partisan champion of the New Deal during the 1930s and 1940s. Her strong advocacy of administration policies and programs was predicated on a number of factors: her assessment of the low status of black Americans during the Depression; her faith in the willingness of some liberal whites to work for the inclusion of blacks in the government's reform and recovery measures; her conviction that only massive federal aid could elevate the Negro economically; and her belief that the thirties and forties were producing a more self-aware and self-assured black population. Like a number of her white friends in government, Bethune assumed that the preservation of democracy and black people's "full integration into the benefits and the responsibilities" of American life were inextricably tied together. She was convinced that, with the help of a friendly government, a militant, aggressive "New Negro" would emerge out of the devastation of depression and war, a "New Negro" who would "save America from itself", who would lead America toward the full realization of its democratic ideas.

Hamilton's Interference in Thomas Pinckney's Presidential Election

To broaden their voting appeal in the Presidential election of 1796, the Federalists selected Thomas Pinckney, a leading South Carolinian, as running mate for the New Englander John Adams. But Pinckney's Southern friends chose to ignore their party's intentions and regarded Pinckney as a Presidential candidate, creating a political situation that Alexander Hamilton was determined to exploit. Hamilton had long been wary of Adams' stubbornly independent brand of politics and preferred to see his running mate, over whom he could exert more control, in the President's chair.

The election was held under the system originally established by the Constitution. At that time there was but a single tally, with the candidate receiving the largest number of electoral votes declared President and the candidate with the second largest number declared Vice-President. Hamilton anticipated that all the Federalists in the North would vote for Adams and Pinckney equally in an attempt to ensure that Jefferson would not be either first or second in the voting. Pinckney would be solidly supported in the South while Adams would not. Hamilton concluded if it were possible to divert a few electoral votes from Adams to Pinckney, Pinckney would receive more than Adams, yet both Federalists would outpoll Jefferson.

Various methods were used to persuade the electors to vote as Hamilton wished. In the press, anonymous articles were published attacking Adams for his monarchical tendencies and Jefferson for being overly democratic, while pushing Pinckney as the only suitable candidate. In

private correspondence with state party leaders the Hamiltonians encouraged the idea that Adams' popularity was slipping, that he could not win the election, and that the Federalists could defeat Jefferson only by supporting Pinckney.

Had sectional pride and loyalty not run as high in New England as in the deep South, Pinckney might well have become Washington's successor. New Englanders, however, realized that equal votes for Adams and Pinckney in their states would defeat Adams; therefore, eighteen electors scratched Pinckney's name from their ballots and deliberately threw away their second votes to men who were not even running. It was fortunate for Adams that they did, for the electors from South Carolina completely abandoned him, giving eight votes to Pinckney and eight to Jefferson.

In the end, Hamilton's interference in Pinckney's candidacy lost even the Vice-Presidency of South Carolina. Without New England's support, Pinckney received only 59 electoral votes, finishing third to Adams and Jefferson. He might have been President in 1797, or as Vice-President a serious contender for the Presidency in 1800; instead, stigmatized by a plot he had not devised, he served a brief term in the United States Senate and then dropped from sight as a national influence.

The Aleut Language

The Aleuts, residing on several islands of the Aleutian Chain, the Pribilof Islands, and the Alaskan Peninsula, have possessed a written language since 1825, when the Russian missionary Ivan Veniaminov selected appropriate characters of the Cyrillic alphabet to represent Aleut speech sounds, recorded the main body of Aleut vocabulary, and formulated grammatical rules. The Czarist Russian conquest of the proud, independent sea hunters was so devastatingly thorough that tribal traditions, even tribal memories, were almost obliterated. The slaughter of the majority of an adult generation was sufficient to destroy the continuity of tribal knowledge, which was dependent upon oral transmission. As a consequence, the Aleuts developed a fanatical devotion to their language as their only cultural heritage.

The Russian occupation placed a heavy linguistic burden on the Aleuts. Not only were they compelled to learn Russian to converse with their overseers and governors, but they had to learn Old Slavonic to take an active part in church services as well as to master the skill of reading and writing their own tongue. In 1867, when the United States purchased Alaska, the Aleuts were unable to break sharply with their immediate past and substitute English for any one of their three languages.

To communicants of the Russian Orthodox Church a knowledge of Slavonic remained vital, as did Russian, the language in which one conversed with the clergy. The Aleuts came to regards English education as a device to wean them from their religious faith. The introduction of compulsory English schooling caused a minor renascence of Russian culture as the Aleut parents sought to counteract the influence of the schoolroom. The harsh life of the Russian colonial rule

began to appear more happy and beautiful in retrospect.

Regulations forbidding instruction in any language other than English increased its unpopularity. The superficial alphabetical resemblance of Russian and Aleut linked the two tongues so closely that every restriction against teaching Russian was interpreted as an attempt to eradicate the Aleut tongue. From the wording of many regulations, it appears that American administrators often had not the slightest idea that the Aleuts were clandestinely reading and writing their own tongue or even had a written language of their own. To too many officials, anything in Cyrillic letters was Russian and something to be stamped out. Bitterness bred by abuses and the exploitations the Aleuts suffered from predatory American traders and adventurers kept alive the Aleut resentment against the language spoken by Americans. Gradually, despite the failure to emancipate the Aleuts from a sterile past by relating the Aleut and English languages more closely, the passage of years has assuaged the bitter misunderstandings and caused an orientation away from Russian toward English as their second language, but Aleut continues to be the language that molds their thought and expression.

Cultural Asphyxia

Above all, colonialism was hated for its explicit assumption that the civilizations of colonized peoples were inferior. Using slogans like *The White Man's Burden* and *La Mission Civilicatrice*, Europeans asserted their moral obligations to impose their way of life on those endowed with inferior cultures. This orientation was particularly blatant among the French. In the colonies, business was conducted in French. Schools used that language and employed curricula designed for children in France. One scholar suggests that Muslim children probably learned no more about the Maghreb than they did about Australia. In the Metropole, intellectuals discoursed on the weakness of Arabo-Islamic culture. A noted historian accused Islam of being hostile to science. An academician wrote that Arabic – the holy language of religion, art and the Muslim sciences – is "more of an encumbrance than an aid to the mind. It is absolutely devoid of precision." There was of course an element of truth in the criticisms. After all, Arab reformists had been engaging in self-criticism for decades. Also, at least some Frenchmen honestly believed they were helping the colonized. A Resident General in Tunisia, for example, told an assemblage of Muslims with sincerity, "We shall distribute to you all that we have of learning; we shall make you a party to everything that makes for the strength of our intelligence." But none of this could change or justify the cultural racism in colonial ideologies. To the French, North Africans were only partly civilized and could be saved only becoming Frenchmen. The reaction of the colonized was of course to defend his identity and to label colonial policy, in the words of Algerian writer Malek Hadad, "cultural asphyxia". Throughout North Africa, nationalists made the defense of Arabo-Islamic civilization a major objective, a value in whose name they demanded independence. Yet the crisis of identity, provoked by colonial experiences, has not been readily assured and lingers into the post-colonial period. A French scholar describes the devastating impact of colonialism by likening it to "the role played for us (in Europe) by the doctrine of original sin". Frantz Fanon, especially in his *Studies in a Dying Colonialism*, well

expresses the North African perspective.

Factors producing militant and romantic cultural nationalism are anchored in time. Memories of colonialism are already beginning to fade and, when the Maghreb had had a few decades in which to grow, dislocations associated with social change can also be expected to be fewer. Whether this means that the cultural nationalism characteristic of the Maghreb today will disappear in the future cannot be known. But a preoccupation with identity and culture and affirmation of Arabism and Islam have characterized the Maghreb since independence and these still remain today important elements in North African life.

A second great preoccupation in independent North Africa is the promotion of a modernist social revolution. The countries of the Maghreb do not pursue development in the same way and there have been variations in policies within each country. But all three spend heavily on development. In Tunisia, for example, the government devotes 20-25% of its annual budget to education, and literacy has climbed from 15% in 1956 to about 50% today. A problem, however, is that such advances are not always compatible with objectives flowing from North African nationalism. In Morocco, for instance, when the government decided to give children an "Arab" education, it was forced to limit enrollments because, among other things, most Moroccans had been educated in French and the country consequently had few teachers qualified to teach in Arabic. Two years later, with literacy rates declining, this part of the Arabization program was postponed. The director of Arabization declared, "We are not fanatics; we want to enter the modern world."

Civic Education of the Republic

The founders of the Republic viewed their revolution primarily in political rather than economic or social terms. And they talked about education as essential to the public good – a goal that took precedence over knowledge as occupational training or as a means to self-fulfillment or self-improvement. Over and over again, the Revolutionary generation, both liberal and conservative in outlook, asserted its conviction that the welfare of the Republic rested upon an educated citizenry and that schools, especially free public schools, would be the best means of educating the citizenry in civic values and the obligations required of everyone in a democratic republican society. All agreed that the principal ingredients of a civic education were literacy and the inculcation of patriotic and moral virtues, some others adding the study of history and the study of principles of the republican government itself.

The founders, as was the case of almost all their successors, were long on exhortation and rhetoric regarding the value of civic education, but they left it to the textbook writers to distill the essence of those values for school children. Texts in American history and government appeared as early as the 1790s. The textbook writers turned out to be very largely of conservative persuasion, more likely Federalist in outlook than Jeffersonian, and almost universally agreed that political virtue must rest upon moral and religious precepts. Since most textbook writers were New Englanders, this meant that the texts were infused with Protestant and, above all,

Puritan outlooks.

In the first half of the Republic, civic education in the schools emphasized the inculcation of civic values and made little attempt to develop participatory political skills. That was a task left to incipient political parties, town meetings, churches, and the coffee or ale houses where men gathered for conversation. Additionally, as a reading of certain Federalist papers of the period would demonstrate, the press probably did more to disseminate realistic as well as partisan knowledge of government than the schools. The goal of education, however, was to achieve a higher form of unum for the new Republic. In the middle half of the nineteenth century, the political values taught in the public and private schools did not change substantially from those celebrated in the first fifty years of the Republic. In the textbooks of the day, their rosy hues if anything became golden. To the resplendent values of liberty, equality, and a benevolent Christian morality were now added the middle-class virtues – especially of New England – of hard work, honesty and integrity, the rewards of individual effort, and obedience to parents and legitimate authority. But of all the political values taught in school, patriotism was preeminent; and whenever teachers explained to school children why they should love their country above all else, the idea of liberty assumed pride of place.

Voyage of Leif and Biarni in Two Narratives

In the summer of 999, Leif Ericsson voyaged to Norway and spent the following winter with King Olaf Tryggvason. Substantially the same account is given by both the Saga of Eric the Red and the Flat Island Book. Of Leif's return voyage to Greenland the latter says nothing, but according to the former it was during this return voyage that Leif discovered America. The Flat Island Book, however, tells of another and earlier landfall by Biarni, the son of a prominent man named Heriulf, and makes of this Leif's inspiration for the voyage to the new land. In short, like Leif, Biarni and his companions sight three countries in succession before reaching Greenland, and to come upon each new land takes 1 "doegr" more than the last until Biarni comes to land directly in front of his father's house in the last-mentioned country.

This narrative has been rejected by most later writers, and they may be justified. Possibly, Biarni was a companion of Leif when he voyaged from Norway to Greenland via America, or it may be that the entire tale is but a garbled account of that voyage and Biarni another name for Leif. It should be noted, however, that the stories of Leif's visit to King Olaf and Biarni's to that king's predecessor are in the same narrative in the Flat Island Book, so there is less likelihood of duplication than if they were from different sources. Also, Biarni landed on none of the lands he passed, but Leif apparently landed on one, for he brought back specimens of wheat, vines, and timber. Nor is there any good reason to believe that the first land visited by Biarni was Wineland. The first land was "level and covered with woods," and "there were small hillocks upon it." Of forests, later writers do not emphasize them particularly in connection with Wineland, though they are often noted incidentally; and of hills, the Saga says of Wineland only that "whatever there was hilly ground, there were vines."

Additionally, if the two narratives were taken from the same source we should expect a closer resemblance of Helluland. The Saga says of it: "They found there hellus (large flat stones)." According to the Biarni narrative, however, "this land was high and mountainous." The intervals of 1, 2, 3, and 4 "doegr" in both narratives are suggestive, but mythic formulas of this kind may be introduced into narratives without altogether destroying their historicity. It is also held against the Biarni narrative that its hero is made to come upon the coast of Greenland exactly in front of his father's home. But it should be recalled that Heriulfsness lay below two high mountains which served as landmarks for navigators. I would give up Biarni more readily were it not that the story of Leif's voyage contained in the supposedly more reliable Saga is almost as amazing. But Leif's voyage across the entire width of the north Atlantic is said to be "probable" because it is documented in the narrative of a preferred authority, while Biarni's is "improbable" or even "impossible" because the document containing it has been condemned.

Desegregation in Public Education

During the 1930s, National Association for the Advancement of Colored People (NAACP) attorneys Charles H. Houston, William Hastie, James M. Nabrit, Leon Ransom, and Thurgood Marshall charted a legal strategy designed to end segregation in education. They developed a series of legal cases challenging segregation in graduate and professional schools. Houston believed that the battle against segregation had to begin at the highest academic level in order to mitigate fear of race mixing that could create even greater hostility and reluctance on the part of white judges. After establishing a series of favorable legal precedents in higher education, NAACP attorneys planned to launch an all-out attack on the separate-but-equal doctrine in primary and secondary schools. The strategy proved successful. In four major United States Supreme Court decisions, precedents were established that would enable the NAACP to construct a solid legal foundation upon which the Brown case could rest: *Missouri ex rel. Gaines* v. *Canada*, Registrar of the University of Missouri (1938); *Sipuel* v. *Board of Regents of the University of Oklahoma* (1948); *McLaurin* v. *Oklahoma State Regents for Higher Education* (1950); and *Sweatt* v. *Painter* (1950).

In the Oklahoma case, the Supreme Court held that the plaintiff was entitled to enroll in the university. The Oklahoma Regents responded by separating black and white students in cafeterias and classrooms. The 1950 McLaurin decision ruled that such internal separation was unconstitutional. In the Sweatt ruling, delivered on the same day, the Supreme Court held that the maintenance of separate law schools for whites and blacks was unconstitutional. A year after Herman Sweatt entered the University of Texas law school, desegregation cases were filed in the states of Kansas, South Carolina, Virginia, and Delaware, and in the District of Columbia asking the courts to apply the qualitative test of the Sweatt case to the elementary and secondary schools and to declare the separate-but-equal doctrine invalid in the area of public education.

The 1954 *Brown* v. *Board of Education* decision declared that a classification based solely on

race violated the 14th Amendment to the United States Constitution. The decision reversed the 1896 *Plessy* v. *Ferguson* ruling which had established the separate-but-equal doctrine. The *Brown* decision more than any other case launched the "equalitarian revolution" in American jurisprudence and signaled the emerging primacy of equality as a guide to constitutional decisions; nevertheless, the decision did not end state sanctioned segregation. Indeed, the second *Brown* decision, known as *Brown II* and delivered a year later, played a decisive role in limiting the effectiveness and impact of the 1954 case by providing southern states with the opportunity to delay the implementation of desegregation.

The intervention of the federal government and the deployment of the National Guard in the 1954 Little Rock crisis, and again in 1963 when the enrollment of James Meredith desegregated the University of Mississippi, highlight the role of federal power in promoting social change during this era. While black local and national leaders organized and orchestrated the legal struggles, and students joined in freedom rides and staged sit-ins, another equally important dimension of the rights quest took shape: the battle between federal and state authority and the evolution of the doctrine of federalism. The fact remains that the United States Supreme Court lacked the power to enforce its decisions. President Dwight D. Eisenhower's use of federal troops in Little Rock was a major departure from the reluctance of past presidents to display federal power in the South, especially to protect the lives and rights of black citizens.

Private and Public Hospitals

Public general hospitals originated in the almshouse infirmaries established as early as colonial times by local governments to care for the poor. Later, in the late eighteenth and early nineteenth centuries, the infirmary separated from the almshouse and became an independent institution supported by local tax money. At the same time, private charity hospitals began to develop. Both private and public hospitals provided mainly food and shelter for the impoverished sick, since there was little that medicine could actually do to cure illness, and the middle class was treated at home by private physicians.

Late in the nineteenth century, the private charity hospital began trying to attract middle-class patients. Although the depression of 1890 stimulated the growth of charitable institutions and an expanding urban population became dependent on assistance, there was a decline in private contributions to these organizations which forced them to look to local government for financial support. Since private institutions had also lost benefactors, they began to charge patients. In order to attract middle-class patients, private institutions provided services and amenities that distinguished between paying and non-paying patients and made the hospital a desirable place for private physicians to treat their own patients. As paying patients became more necessary to the survival of the private hospital, the public hospitals slowly became the only place for the poor to get treatment. By the end of the nineteenth century, cities were reimbursing private hospitals for their care of indigent patients and the public hospitals remained dependent on the tax dollars.

The advent of private hospital health insurance, which provided middle-class patients with the purchasing power to pay for private hospital services, guaranteed the private hospital a regular source of income. Private hospitals restricted themselves to revenue-generating patients, leaving the public hospitals to care for the poor. Although public hospitals continued to provide services for patients with communicable diseases and outpatient and emergency services, the Blue Cross plans developed around the needs of the private hospitals and the inpatients they served. Thus, reimbursement for ambulatory care has been minimal under most Blue Cross plans, and provision of outpatient care has not been a major function of the private hospital, in part because private patients can afford to pay for the services of private physicians. Additionally, since World War II, there has been a tremendous influx of federal money into private medical schools and the hospitals associated with them. Further, large private medical centers with expensive research equipment and programs have attracted the best administrators, physicians, and researchers. As a result of the greater resources available to the private medical centers, public hospitals have increasing problems attracting highly qualified research and medical personnel. With the mainstream of health care firmly established in the private medical sector, the public hospital has become a "dumping ground."

Japanese Character

The uniqueness of the Japanese character is the result of two seemingly contradictory forces: the strength of traditions, and selective receptivity to foreign achievements and inventions. As early as the 1860s, there were counter movements to the traditional orientation. Yukichi Fukuzawa, the most eloquent spokesman of Japan's "Enlightenment," claimed "The Confucian civilization of the East seems to lack two things possessed by Western civilization: science in the material sphere and a sense of independence in the spiritual sphere." Fukuzawa's great influence is found in the free and individualistic philosophy of the *Education Code* of 1872, but he was not able to prevent the government from turning back to the canons of Confucian thought in the *Imperial Prescript* of 1890. Another interlude of relative liberalism followed World War I, when the democratic idealism of President Woodrow Wilson had an important impact on Japanese intellectuals and, especially students; but more important was the Leninist ideology of the 1917 Bolshevik Revolution. Again, in the early 1930s, nationalism and militarism became dominant, largely as a result of failing economic conditions.

Following the end of World War II, substantial changes were undertaken in Japan to liberate the individual from authoritarian restraints. The new democratic value system was accepted by many teachers, students, intellectuals, and old liberals, but it was not immediately embraced by the society as a whole. Japanese traditions were dominated by group values, and notions of personal freedom and individual rights were unfamiliar.

Today, democratic processes are clearly evident in the widespread participation of the Japanese people in social and political life; yet, there is no universally accepted and stable value system.

Values are constantly modified by strong infusions of Western ideas, both democratic and Marxist. School textbooks expound democratic principles, emphasizing equality over hierarchy and rationalism over tradition; but in practice these values are often misinterpreted and distorted, particularly by the youth who translate the individualistic and humanistic goals of democracy into egoistic and materialistic ones.

Most Japanese people have consciously rejected Confucianism, but vestiges of the old order remain. An important feature of relationships in many institutions such as political parties, large corporations, and university faculties is the *oyabun-kobun* or parent-child relation. A party leader, supervisor, or professor, in return for loyalty, protects those subordinate to him and takes general responsibility for their interests throughout their entire lives, an obligation that sometimes even extends to arranging marriages. The corresponding loyalty of the individual to his patron reinforces his allegiance to the group to which they both belong. A willingness to cooperate with other members of the group and to support without qualification the interests of the group in all its external relations is still a widely respected virtue. The *oyabun-kobun* creates ladders of mobility which an individual can ascend, rising as far as abilities permit, so long as he maintains successful personal ties with a superior in the vertical channel, the latter requirement usually taking precedence over a need for exceptional competence. As a consequence, there is little horizontal relationship between people even within the same profession.

English Expedition Overseas

England became unified late in the 15th century. On Bosworth Field, in 1845, Henry Tudor put an end to the civil strife of the Wars of the Roses and crowned himself Henry VII. Forcefully bringing recalcitrant nobles to heel, he strengthened his authority. For the first time in nearly a century, the country had stability in government and a considerable degree of peace and prosperity. Henry, therefore, could devote his attention to the promotion of commerce. He encouraged English merchants to enter foreign trade, supported the formation of trading companies, and restricted the activities of the foreign merchants in London and Bristol, who had monopolized trade. Columbus even sent his brother to England when he failed to obtain support from the Portuguese or Spanish Kings for his proposal that Cathay could be reached by sailing west across the Atlantic. Henry VII agreed to finance the voyage and urged Columbus to come at once to England. But, before the latter left Spain, the Spanish monarchs experienced a change of heart and supported the voyage that was to give Spain an empire.

Meanwhile, Henry VII never gave up his hope of obtaining for England a share of the rich Eastern trade. British merchants established a trade link with Iceland about 1490. And, encouraged by news of Columbus' voyage, on March 5, 1496, Henry VII granted letters-patent to the "well-beloved John Cabot" and his three sons to sail across the Atlantic to Asia. An Italian-born navigator, Cabot had lived in England since 1484. As a youth, he had visited the East, and when he arrived in London he had already decided that an all-water route could be found to the trading centers there. He may have made a few trips to Iceland before the King

commissioned his trans-Atlantic voyage.

In May of 1497, Cabot left Bristol with a crew of 18 and, after a voyage of 52 days across the North Atlantic, landed on Cape Breton Island and took possession of the land for Henry VII. From there, he explored several islands in the Gulf of St. Lawrence and in August returned to England and the praise of Henry VII, who granted him new letters-patent. When Cabot sailed again, in 1498, he had perhaps 5 or 6 ships, whose crews totaled some 300 men. The King personally financed a substantial portion of the expedition's cost. On his second voyage, Cabot probably explored the North American coast from Newfoundland south of the Delaware of Chesapeake Bays.

Having failed to find the shores of Cathay (China) or Cipango (Japan), the English turned in the opposite direction. Henry VII's son, Henry VIII – better known for his marital involvements and his break with the Pope – enthusiastically began to build "a fleet the like of which the world has never seen." John Cabot's son, Sebastian, became a renowned navigator. After serving Spain for a number of years, he returned to England and opened the northern sea-land route to Moscow. He also helped found the company of Merchant-Adventurers, predecessor of the Muscovy Company, and became its president for life.

Thus, for nearly a century, England's interest was diverted from the New World, and her energies were concentrated on the development of a commercial empire and a merchant fleet that became second to none in Europe. But John Cabot had given England a claim to the northern shores of the New World, and in the course of time the "sea dogs" and other English mariners were to breathe new life into it.

Religious Situation in 17th Century England

Not long after the founding of Virginia, other Englishmen established another colony to the north. In 1620, a shipload of religious dissenters, later known as Pilgrims, debarked from the *Mayflower* on the western shore of Cape Cod Bay, on the coast of Massachusetts. The nucleus of the group were Puritan separatists, part of a congregation of nonconformists of Scrooby parish in Nottinghamshire, England. Because of the strict enforcement of the religious laws by James I, in 1608-1609 the entire congregation of about 100 had moved to Holland seeking toleration. In 1620, they received permission from the Crown and financial backing from the London Company to migrate to Virginia. About 35 members of the congregation chose to do so; they first traveled to England, where they joined another group of dissenters. The *Mayflower* carried 101 passengers and a crew of 48. They were the first Englishmen – but by no means the last – to escape Stuart persecution in the New World.

The religious situation in England had grown complicated since Henry VIII separated the established church from Rome and placed himself at its head. In the last years of his reign, pressure from Protestant reformers forced him to modify much of the ecclesiastical code. After

his death, the regents of his young son stimulated the Protestant movement. Mary then had attempted to reverse the tide, but Elizabeth wisely chose a middle course. She instituted moderate reforms in the Church of England and, though not disposed to tolerance of Protestants, did not rigorously enforce the regulations that restricted them.

A large group arose that wanted to continue the process of reform. Gradually they came to be called Puritans. Those Anglicans who would "purify" the church from within were known as conforming Puritans; those favoring stronger measures, as nonconformists, dissenters, or separatists. Religious disputation was the rage of the day, when translations of the Bible were first beginning to reach the hands of the people, who were also stimulated by the controversies that the Reformation had fostered. Interestingly enough, the version on which the Scrooby Pilgrims based their dissent was probably the Bishops' Bible, not the King James translation used today by most Protestant sects.

By authorizing this magnificent translation, James I undoubtedly hoped to put an end to dissent; instead, he only quickened it. His other religious policies, which grew harsher toward the end of his reign, were also designed to stamp out the heresy that was budding all over England. The King increased the pressure on nonconformists and separatists, and churchmen grew more and more intolerant, even of the conforming Puritans. But the more vigorous the pruning, the healthier the plant became. After James died, in 1625, his son Charles I (1625-49) proved to be even less tolerant. A bloody revolution cost Charles his throne and his life, and the Puritan colonies in New England grew rapidly.

The Agricultural Adjustment Act (AAA)

President Roosevelt's administration suffered a devastating defeat when, on January 6, 1936, the Agricultural Adjustment Act was declared unconstitutional. New Deal planners quickly pushed through Congress the Soil Conservation and Domestic Allotment Act of 1935, our purpose of which was conservation, but which also aimed at controlling surpluses by retiring land from production. The law was intended as a stopgap measure until the administration could formulate a permanent farm program that would satisfy both the nation's farmers and the Supreme Court. Roosevelt's landslide victory over London in 1936 obscured the ambivalent nature of his support in the farm states. Despite extensive government propaganda, many farmers still refused to participate in the Agricultural Adjustment Administration's voluntary production control programs, and the burdensome surpluses of 1933 were gone – not the result of the AAA, but a consequence of great droughts.

In February of 1937, Secretary of Agriculture Wallace convened a meeting of farm leaders to promote the concept of the ever-normal granary, a policy that would encourage farmers to store crop surpluses (rather than dump them on the market) until grain was needed in years of small harvests. The Commodity Credit Corporation would grant loans to be repaid when the grain was later sold for a reasonable profit. The conference chose a Committee of Eighteen, which drafted a

bill, but the major farm organizations were divided. Since ten of the eighteen members were also members of the American Farm Bureau Federation, the measure was quickly labeled a Farm Bureau bill, and there were protests from the small, but highly vocal, Farmer's Holiday Association. When debate on the bill began, Roosevelt himself was vague and elusive and didn't move the proposed legislation into the "desirable" category until midsummer. In addition, there were demands that the New Deal's deficit spending be curtailed, and opponents of the bill charged that the AAA was wasteful and primarily benefited corporations and large-scale farmers.

The Soil Conservation and Domestic Allotment Act had failed to limit agricultural production as the administration had hoped. Farm prices and consumer demand were high, and many farmers, convinced that the drought had ended the need for crop controls, refused to participate in the AAA's soil conservation program. Without direct crop controls, agricultural production skyrocketed in 1937, and by late summer there was panic in the farm belt that prices would again be driven down to disastrously low levels. Congressmen began to pressure Roosevelt to place a floor under farm prices by making loans through the CCC, but Roosevelt made such loans contingent upon the willingness of Congress to support the administration's plan for a new system of crop controls. When the price of cotton began to drop, Roosevelt's adroit political maneuver finally forced congressional representatives from the South to agree to support a bill providing for crop controls and the ever-normal granary. The following year Congress passed the Agricultural Adjustment Act of 1938.

American Indians

In describing the Indians of the various sections of the United States at different stages in their history, some of the factors which account for their similarity amid difference can be readily accounted for, others are difficult to discern.

The basic physical similarity of the Indians from Alaska to Patagonia is explained by the fact that they all came originally from Asia by way of the Bering Strait and the Aleutian Islands into Alaska and then southward. They came in different waves, the earliest around 25,000 years ago, the latest probably not long before American was discovered by Europeans. Because these people all came from Asia and were therefore drawn from the same pool of Asiatic people, they tended to look alike. But since the various waves of migration crossed into Alaska at widely separated times, there were differences among them in their physical characteristics.

There were also differences in cultural equipment. The earliest arrivals are known to science only through their simple tools of chipped stone and bone. Despite their limited technical equipment, some of the New Mexico Indians were very successful big game hunters. Twenty-five thousand years ago they were hunting the woolly mammoth, the giant bison, the ground sloth and the camel, all characteristic animals of the closing phases of the last ice age.

After their arrival from Asia in various waves across the Bering Strait, the early peoples in the

Americas slowly spread southward into the vast empty spaces of the two continents. A group of people moving slowly down the Mackenzie River valley east of the Rockies into the general region of Southern Alberta, then eastward across the northern prairies reaching the wooded country around the upper Mississippi valley until some final settlement was reached in the Gulf states, would encounter a wide variety of physical environments. At various stages of such wanderings they would have to evolve methods of coping with the cold, barren, tundra country of northern Canada; the prairies, cold, treeless but well stocked with large game; then later the completely different flora and fauna of the Minnesota-Wisconsin-Illinois area, thickly forested and well watered and providing abundance of small game and wild vegetable foods; then the semi-tropical character of the lower Mississippi country as they neared the Gulf of Mexico. Since such a migration would be spread over many centuries, the modification of whatever basic culture they had on their arrival from Asia would be very slow. Yet the end result would be completely different from their original culture. It would also be different from the final culture of a closely allied group who became separated from them early in their wanderings and whose movements led them into different types of country. In its final form, the culture of this second group would have little in common with that of the first except perhaps a continuing resemblance in language and in physical type.

New Liberals

Late in the nineteenth century, land reform emerged as a dominant concern of the Liberal Party in England. During this time, many prominent thinkers dissented from mainstream liberal ideology by questioning the justification of individual ownership. To John Stuart Mill, Henry George, and Herbert Spencer, for example, land represented something unique among ownable goods as "a thing not made by man, a thing necessary to life, and of which there is not enough for all." With these attributes – naturalness of origin, absolute scarcity, and centrality to all productive life-sustaining activity – land and land ownership, it was asserted, could be considered indefensible rights based upon personal labor or achievement.

Prior to the emergence of these political analysts, the *laissez-faire* views of Adam Smith were the dominant liberal position. Smith asserted that "the interests of the state requires that land should be as much in commerce as any other good." The "new liberal" thinking, however, rejected this traditional notion and attacked the institutions of primogeniture and strict family settlement that enabled the landed class to maintain their estates from one generation to the next. The new liberal ideology encompassed both economic and social goals. They envisioned a break with the static conditions of primogeniture and its replacement with a more egalitarian and morally vigorous society of peasant proprietors.

In addressing the dilemma of land ownership, proponents of the new liberal thinking offered several different strategies. Herbert Spencer's proposal sought to make land the joint property of society in which all land would be confiscated by the (democratic) state. Individuals might then lease parts of it through competitive bidding. By paying rent, tenants would thus compensate all

non-owners for having relinquished their claim.

John Stuart Mill employed the law of rent to show that increased land values can not be attributed to the exertions undertaken by owners; most often, rather, such increases are the function of the "mere progress of wealth and population." In his *Political Economy*, Mill held that private property is justified only as the proprietor of land is its improver. Some policies advocated by Mill included a special tax on rent, the protection of tenants' rights, state land purchases, and measures, however, Mill insisted that present owners were owed compensation. His proposal of a special tax on land pertained to future unearned income without disturbing past acquisitions.

According to Henry George, another prominent new liberal, virtually all social and moral ills of modern society could be traced to private ownership of land. In *Progress and Poverty*, George rejects the inevitability of poverty and deprivation as remedial defects of society. In his view, rent represented not only unearned income, but a deleterious drain on much of society's earned income that absorbed the disposable surplus created by society's cooperative efforts. George's solution lay in the socialization of rent. He proposed that the community recapture its entitlement through a special tax on the rental value of land; a levy – known as the "single tax" – would eliminate the need for taxing productive enterprises and would eventually replace all other taxes.

Robert Morris

Merchant Robert Morris was a man of many distinctions. One of the wealthiest individuals in the Colonies and an economic wizard, he won the accolade "Financier of the Revolution," yet died penniless and forgotten. He and Roger Sherman were the only signers of all three of the Nation's basic documents: the Declaration of Independence, Articles of Confederation, and Constitution. Morris, who turned down appointment as the first Secretary of the Treasury, also served as a Senator in the First Congress.

Morris was born in or near Liverpool, England, in 1734. At the age of 13, he emigrated to Maryland to join his father, a tobacco exporter at Oxford, Md. After brief schooling at Philadelphia, the youth obtained employment with Thomas and Charles Willing's well-known shipping firm. In 1754 he became a partner, and for almost four decades was one of the company's directors as well as one of Philadelphia's most influential citizens. Marrying in 1769 at the age of 35, he fathered five sons and two daughters.

During the Stamp Act turmoil in 1765, Morris had joined other merchants in protest, but not until the outbreak of hostilities a decade hence did he fully commit himself to the Revolution. In 1775 the Continental Congress contracted with his firm to import arms and ammunition; and he was elected to the Pennsylvania council of safety (1775-76), the committee of correspondence, the provincial assembly (1775-76), the State legislature (1776-78), and the Continental Congress (1775-78). In the latter body, on July 1, 1776, he voted against independence, which he

personally considered premature, but the next day purposely absented himself to facilitate an affirmative ballot by his State.

Morris, a key Member of Congress, specialized in financial affairs and military procurement. Although he and his firm profited handsomely, had it not been for his assiduous labors the Continental Army would probably have needed to demobilize. He worked closely with General Washington, wheedled money and supplies from the States, borrowed money in the face of overwhelming difficulties, and on occasion even obtained personal loans to further the war cause. Immediately following his congressional service, Morris sat for two more terms in the Pennsylvania legislature in the period between 1778 and 1781. During this time, Thomas Paine and others attacked him for profiteering in Congress, which investigated his accounts and vindicated him. Nevertheless, his reputation slipped.

Morris embarked on the most dramatic phase of his career by accepting the office of Superintendent of Finance (1781-84) under the Articles of Confederation. Congress, recognizing the perilous state of the Nation's finances and its impotence to remedy it, granted him dictatorial powers and acquiesced to his condition that he be allowed to continue his private commercial enterprises. He slashed all governmental and military expenditures, personally purchased Army and Navy supplies, tightened accounting procedures, prodded the States to fulfill quotas of money and supplies, and when necessary strained his personal credit by issuing notes over his own signature or borrowing from friends.

To finance Washington's Yorktown campaign in 1781, in addition to the above techniques Morris obtained a sizable loan from France. He used part of it, along with some of his own fortune, to organize the Bank of North America, chartered that December. The first government-incorporated bank in the United States, it aided war financing.

King Alfred

King Alfred had occupied and fortified London in 886, and during the subsequent years he began construction of his system of *burhs*, or fortresses, throughout Wessex. The surrounding villages and estates were held responsible for providing men to defend the burhs in numbers proportionate to the amount of land their farmers cultivated. Though not completed until during the reign of Alfred's son Edward, this system of fortresses did much to hamper the Danish invaders during the last great war of Alfred's reign.

This war began in 893, when Danish *Vikings* who had been repelled from Germany invaded England and joined forces with the by then well-established English Danes. For three years, Alfred and Ethelred of Mercia fought the Danes throughout southern England. On numerous occasions, Alfred's strategic skills turned away Danish advances, as when he marched on London unexpectedly during the harvest season of 894 to prevent the Danes from seizing the crops for winter sustenance and subsequently clinched the triumph by a fortress-and-dam blockade of the

Thames. In 896, huge longboats of a new design devised by Alfred decimated and scattered a force of Danish raiding ships. By 897, the second invasion had been soundly defeated. This ended Alfred's military career, since the Danes did not reopen their attempts to conquer Wessex until after Alfred's death in 899.

The technique of combining imaginative innovations with highly practical administrative measures that served Alfred well as a general can also be seen in the record of his nonmilitary career. The methodical nature evidenced by the system of burhs is shown in the organization of his court. Officeholders were divided into three groups that served rotating one-month shifts, thus freeing them to tend their farmlands two months out of every three. (Alfred had introduced a similar policy for his soldiers, largely eliminating the common problem of an army deserting in mid-campaign at planting or harvest time.) Alfred's finances were also systematized, with revenues divided into two shares for secular and religious purposes. Each share in turn was methodically subdivided into a number of preplanned expenditure categories.

Alfred won a name as a strict and conscientious overseer of the ealdormen, reeves and others with judicial functions. His own reputation as a judge is suggested by a comment in a charter issued during his son's reign. In upholding one of Alfred's decisions, the anonymous author of the charter asked rhetorically, "When would any claim be decided if every judgment which Alfred made were in dispute?"

Alfred's major contribution to the legal system of his day was his systematization of the law code. Alfred's law book was compiled, significantly, from laws previously issued not only by Alfred's own predecessor Ine (King of Wessex 688-726) but also by Offa of Mercia and Ethelbert of Kent. The use of all three sources reflects the increased English unity created by the pressure of the Danish invasions and by Alfred's own unique prestige and power.

America's Drift to World War I

Meanwhile, the problem of neutral rights on the seas revived to plague America's relations with the belligerents. One of the German justifications for its shoot-on-sight policy was, as we have seen the fragility of the U-boat and its vulnerability to even armed merchant vessels. To deal with this problem, in early 1916 Lansing proposed a modus vivendi: if the Allies agreed to disarm their merchant ships, the Germans would agree to the principle, suspended but not yet formally acknowledged, that their submarines would not attack such vessels without warning and without protecting the safety of civilians. In effect, the submarine would function as a surface cruiser and observe the rules of naval warfare laid down in past years.

Unwilling to surrender what they considered a well-established right to arm surface vessels in exchange for a German concession to abide by existing international law, the British rejected the proposal immediately. Faced with this hostile response, Lansing quickly dropped the modus vivendi proposal. Unfortunately, he had opened a Pandora's box. In explaining it to the German

government, Lansing had implied that the American government regarded Allied armed merchant vessels as warships. This had been the German position all along, and they eagerly seized on the opening the Americans had created. On February 10 the kaiser's government informed the American State Department that beginning on February 29, German U-boats would resume their attacks on *armed* merchant vessels without prior warning. In effect, the truce ushered in by the *Arabic* pledge was over.

The sequence of events alarmed the pacifists and the isolationists. The Wilson administration, by dropping the modus vivendi, seemed to be saying that it accepted the British position that armed merchant vessels were not warships. If this were so, then by the administration's interpretation, Americans would have the right to travel on such vessels. Since the Germans now intended to attack them on sight, Wilson was almost guaranteeing a collision with Germany. Hoping to head off such a confrontation, Representative Jeff Mclemore of Texas and Senator Thomas P. Gore of Oklahoma introduced resolutions forbidding American travel on armed or contraband-carrying ships. Wilson interpreted this as a challenge to his leadership in foreign affairs and a cowardly surrender of American rights. "For my own part," he wrote the chairman of the Senate Foreign Relations Committee, "I cannot consent to any abridgement of the rights of American citizens in any respect ... Once accept a single abatement of rights, and many other humiliations would certainly follow, and the whole fine fabric of international law might crumble under our hands piece by piece." Congress backed down under the President's pressure and tabled the Gore-Mclemore resolutions. Wilson's victory over Congress and the peace groups marked the further drift to war.

The Early North American Indians

Although humans likely entered the New World as early as 20,000 to 40,000 years ago, the first solid evidence of their presence, which was found in the Midwest, dates from the Paleo-Indian period (10000 to 8000 B.C.). By the beginning of this period, humans had spread throughout both continents of the Western Hemisphere and had developed distinctive tool kits for exploiting the environment. Archaeological data suggest that subsistence activities centered around hunting large late-Pleistocene mammals, such as bison, mammoth, and mastodon. This exploitative pattern is frequently referred to as the big-game hunting tradition. It is probable that small game animals and plant resources also played an important, if not dominant, part in the subsistence activities during this period, but there is currently little archaeological evidence to substantiate this proposition. Social groups probably consisted of small bands that wandered over large areas in pursuit of game and other scattered resources.

The transition from Paleo-Indian to Archaic occurred gradually throughout the eastern woodlands and is generally correlated with the retreat of the glaciers as well as with the concomitant change in the kinds and distributions of plant and animal resources. Dates assigned to the Archaic period range between approximately 8000 B.C. and 1000 B.C. This long period can be further subdivided into three parts: the Early Archaic (8000 to 5000 B.C.), Middle Archaic

(5000 to 2000 B.C.), and Late Archaic (2000 to 1000 B.C.).

Archaic subsistence activities focused on gathering from localized areas a wide range of wild resources, such as large and small mammals, birds, fish, nuts, and seeds. Through time, Archaic populations developed from small, scattered groups scavenging resources over a wide area to larger groups forming greater regional populations that occupied more limited territories. Groups apparently moved from place to place to collect a variety of localized resources in a seasonal round. The Archaic period marks the beginning of the development of regional cultural traditions that persist into later times throughout the eastern woodlands.

During the Early Archaic period, sites tend to be small and scattered, much like those of the Paleo-Indian period. Sites occur primarily in upland situations, but Early Archaic remains have also been found in rock shelters and along high river terraces. Sites located in upland contexts are frequently concentrated near secondary stream valleys along major rivers. The variety of site locations evidently reflects seasonal shifts of settlements during the Early Archaic period. However, in some areas, such as the lower Mississippi Valley, where Early Archaic sites are located in bottomland situations, variation in settlement type may be more a reflection of functional differences than of seasonal shifts.

During the Middle Archaic period, subsistence emphasis shifts toward more intensive utilization of localized resources, with a stress on exploiting forest and riverine contexts. Data from the lower Illinois River Valley suggest that a broad spectrum of fauna was being taken along with a limited number of highly productive floral resources, such as hickory nuts. The appearance of the grinding stone in the tool inventory indicates that nuts and seeds had become an important part of the subsistence base. The beginning of the manufacture of ground-stone tools, such as axes, suggests to some investigators that wood working was also an important activity. Base camps with permanent habitation structures appear as part of the settlement system and are apparently occupied for most, if not all, of a year. The earliest burials in Illinois also occur during this period.

Horse Raiding

From the time they first acquired the horse in the eighteenth century, the three tribes of the Blackfeet nation – Blackfeet, Bloods, and Peigans – turned to horse raiding as one of their main vocations. Any of their enemies were possible prey for small war parties, but the transmountain tribes, such as the Nez Perce, Flathead, and Shoshone, were particular targets because of their fine breed of horses.

Throughout the nomadic years, war parties from the Blackfeet were usually organized for one of two purposes. Either they were formed to capture horses from enemy tribes or they went out to revenge an attack suffered by their own people. The horse raiding expeditions were often made up of small groups of young warriors from different camps. Their party had no permanent

organization but was usually formed for a single raid and then disbanded. Quite often it would be led by and experienced older warrior, while young untried boys went along as servants to learn the art of horse raiding. The revenge party, on the other hand, was usually a large, well-organized group of warriors who were bent on killing their enemies. Their victims did not have to be the same persons who had attacked them; more often, the victims were not even from the same tribe. The need for revenge would be satisfied in any case.

The taking of human life was not usually one of the objectives of a horse raid. The war party preferred to creep into enemy territory undetected, take their booty of horses, and return to their own camps. The enemy herds grazing on the prairie were fairly easy to seize, but the prized buffalo runners and racehorses were usually kept under closer guard within the camp. These horses were tied to the owner's tepee – or, in some cases, even to the owner's wrist – by a long rope. It was considered a great feat if a raider could successfully creep into camp, cut this rope, and take the animal.

Of course, many raiding parties were discovered in enemy territory and treated unmercifully. But the Blackfeet were as brave in battle as they were stealthful in raiding. Many heroic tales among these tribes tell of warriors who fought their way out of such perilous situations.

The intertribal raiding for horses began to wane in the 1880s. The last recorded raid in which a human life was taken occurred in 1889, when a war party of Bloods took forty horses from the Crow Indians. While returning north to their own reservation, they were suddenly attacked by Assiniboine Indians and managed to kill and scalp at least one of their attackers.

Among the Northern Blackfeet, the last recorded raid also took place in 1889, when two warriors returned to their camps with twelve horses taken in Montana. These were seized by Head Chief Crowfoot and turned over to the Mounted Police.

The last raid among the Montana Blackfeet seems to have occurred as late as 1892. The leader in this case was White Quiver, perhaps the greatest of all Blackfoot raiders. He stood trial before the Indian Court but, having turned over four horses alleged to have been stolen from the Crows, was released for lack of evidence.

By this time, the country between the various Indian reservations was becoming too heavily populated for the raiders to travel undetected. Their only recourse was to turn their attention to horses of ranchers and farmers. For the next several years, young men unwilling to give up their old customs conducted raids against the whites, but they met with little success. Lack of sympathy from the chiefs, increased military and police protection, and the expanding white population were all factors that finally ended the horse raiding careers of the Blackfeet.

Blacks in Civil War

In the 1930s and 40s, the few historians who discussed the role of Black people in the American Revolution laid great stress on their contributions to the cause of independence. Such treatments noted that in the northern colonies, Black people petitioned legislatures for freedom as early as 1775, citing the doctrine of natural rights espoused by the White colonists. Black soldiers joined the first militias, serving with distinction at Lexington and Concord. These historians did not hesitate to point out that Congress initially forbade recruiting any Black soldiers, slave or free, even though Washington warned that the Massachusetts veterans, "very much dissatisfied at being discarded," might enlist under the British. (Only after 1777 did several northern states, facing severe recruiting problems, promise to free slaves who entered Colonial military service; southern states rejected similar proposals.) But despite their candor in describing the ambiguities of White response, these earlier historical accounts remained one-sided; they tended simply to stamp Black people with behavior the historians considered "good" (support for American independence) and to ignore the distinctness of Black interests as compared to those of the White colonists.

Later, historians such as Quarles and Mullin, among others balanced the picture by noting the phenomenon of Black Loyalism. As early as November 1775, the royal governor of Virginia raised a militia of several hundred escaped slaves. The British high command, initially reluctant to foreclose chances for reconciliation with the Colonies, later saw the value of depleting the rebels' labor force and creating a threat of insurrection in their rear. The Philipsburg Proclamation, issued in 1779, guaranteed "every Negro who shall desert the Rebel Standard ... full security to follow within these lines any occupation which he [sic] shall think proper." Some one-fifth of the slave population ultimately threw in their lot with the losers. The British settled three thousand of these Loyalists in Nova Scotia after the war, refusing demands by the victors for their return.

The work of Quarles, Mullin, and others has made possible a more sophisticated picture of the Black response to White rebellion. Rather naively supporting one side or the other in the conflict, Black people would seem to have taken advantage of the limited opportunities for emancipation that the war brought, from whatever quarter they came. Nevertheless, we would be well advised not to settle for new stereotypes when we have scarcely begun to look at the direct testimony of colonial Black people themselves. Historians of such mainly-White groups as the colonial merchant seamen have shown that they left behind rich source material despite the general lack of written memoirs; surely the same is true for Black people.

Russians in German Uniforms

No sooner had the British forces in June 1944 carried out their part in the Allied invasion of Germany than they were faced with the fact that among the prisoners of war captured there were Russians in German uniforms. By the time the war in Europe ended, between two and three million Soviet citizens had passed through Allied hands. This extraordinary situation, certainly never before known in the history of war, was the consequence of the policy of both the Soviet and the German regimes. On the Soviet side, the very existence of prisoners of war was not

recognized: the Soviet government refused to adhere to the Geneva Convention, and washed its hands of the millions who fell into German power.

The Germans, in turn, treated their Soviet prisoners with such callous brutality that only a relatively small number of them survived. For a Soviet prisoner in German hands to enlist in the German armed forces was about the only way open to him of saving his life. There were also Soviet citizens whose hatred of the Communist regime was so strong that they were prepared to fight alongside the Germans in order to overthrow Stalin: nominally headed by General Andrey Vlasov, they saw little combat until the end of the war, largely because of Hitler's suspicion of Vlasov's claims to maintain his political independence of the National Socialist regime even as a prisoner of war. There were also some other combat units composed of Russians, some of them noted for their savagery. Then there were hordes of civilians in German hands – some compulsorily swept into the German labor mobilization drive, many more borne along the wave of the German retreat from Russia and thereafter drafted for labor duties. These civilians included many women and children.

The problem facing the British government from the outset was what policy to adopt toward this mass of humanity that did not fall into any of the accepted categories thrown up by war. Quite apart from the logistic problems, there existed a well-established tradition in Britain which refused to repatriate against their will people who found themselves in British hands and the nature of whose reception by their own government was, to say the least, dubious. The first inclination of the Cabinet – to send all captured Russians back to the Soviet Union – was challenged by the minister of economic warfare, Lord Selborne, who was moved by the fact that the Russians in British hands had only volunteered to serve in German uniforms as an alternative to certain death; and that it would therefore be inhuman to send them back to be shot or to suffer long periods of forced labor. Winston Churchill was also swayed by this argument.

U.S. and the First World War

War and change – political and economic foremost, but social and cultural not far behind – have been linked in America from the beginning. War was the necessary factor in the birth of the new American republic, as it has been in the birth of every political state known to us in history. War, chiefly the Civil War, in U.S. history has been a vital force in the rise of industrial capitalism, in the change of America from a dominantly agrarian and pastoral country to one chiefly manufacturing in nature. War, in focusing the mind of a country, stimulates inventions, discoveries, and fresh adaptations. Despite its manifest ill-effects, war, by the simple fact of the intellectual and social changes it instigates, yields results which are tonics to advancement.

By all odds, the most important war in U.S. history, the war that released the greatest number and diversity of changes in American life, was the Great War, the war that began in Europe in August 1914 and engulfed the United States in April 1917. Great changes in America were immediate.

In large measure these changes reflected a release from the sense of isolation, insularity, and exceptionalism that had suffused so much of the American mind during the nineteenth century. The early Puritans had seen their new land as a "city upon a hill" with the eyes of the world on it. It was not proper for the New World to go to the Old for its edification; what was proper was for the Old World, grown feeble and hidebound, to come to America for inspiration. A great deal of that state of mind entered into what Tocqueville called the "American Religion," a religion compounded of Puritanism and ecstatic nationalism.

What we think of today as modernity – in manners and morals as well as ideas and mechanical things – came into full-blown existence in Europe in the final part of the nineteenth century, its centers such cities as London, Paris, and Vienna. In contrast America was a "closed" society, one steeped in conventionality and also in a struggle for identity. This was how many Europeans saw America and it was emphatically how certain somewhat more sophisticated Americans saw themselves. The grand tour was a veritable obligation of better-off, ambitious, and educated Americans – the tour being, of course, of Europe.

Possibly the passage of American values, ideas, and styles from "closed" to "open," from the isolated to the cosmopolitan society, would have taken place, albeit more slowly, had there been no transatlantic war of 1914-1918. We can't be sure. What we do know is that the war, and America's entrance into it, gave dynamic impact to the processes of secularization, individualization, and other kinds of social-psychological change which so drastically changed this country from the America of the turn of the century to the America of the 1920s.

The Populist Movement and McCarthyism

Historians have long known that there were two sides to the Populist movement of the 1890s: a progressive side, embodying the protests of farmers against big business, and a darker side, marked by a distrust of Easterners, immigrants, and intellectuals. In the 1950s, one school of U.S. social thinkers constructed a parallel between this dark side of Populism and the contemporary anti-Communist crusade spearheaded by Wisconsin Senator Joseph McCarthy, which attacked liberalism, Eastern intellectuals, and civil liberties in general. To Seymour Martin Lipset, McCarthyism represented "the sour dregs of Populism"; to Edward Shils, McCarthyism, like Populism, exemplified "the ambiguous American impulse toward 'direct democracy'".

Noting that McCarthyism and Populism had both found their strongest support in the agrarian Midwest, Lipset argued that votes who backed agrarian protest movements during earlier economic crises had supported McCarthy in the post-World War II period of prosperity. "It would be interesting to know," Lipset wrote, "what percentage of those who supported the isolationist but progressive Bob La Follette in Wisconsin now backs McCarthy." But, in the eyes of these writers, the appeal of McCarthyism extended beyond the agrarian base of Populism to include urban groups such as industrial workers. Lipset claimed that "the lower classes, especially the workers" had backed McCarthy. In a more sweeping fashion, Lewis Feuer claimed

that "it was the American lower classes ... who gave their overwhelming support to the attacks in recent years on civil liberties."

Writing a few years later, political scientist Michael Paul Rogin challenged these superficially plausible notions, contending that they merely embodied the writers' own assumptions about the supposed intolerance of lower class groups, rather than a valid interpretation of McCarthyism. Rogin critically examined their assertions by the simple method of testing them against the evidence. He tested Lipset's claims about the continuity of McCarthyism and earlier agrarian protest movements by breaking down statewide voting statistics on a county-by-county and precinct-by-precinct basis. He found that Wisconsin counties that had voted strongly for Progressives before World War II did not support McCarthy; McCarthy's support was concentrated in his home region and in ethnic German areas that had been traditionally conservative. The old Progressive vote had in fact gone to McCarthy's opponents, the Democrats.

To test Lipset's generalizations about McCarthy's support among lower class groups, Rogin attempted to determine whether industrial workers had, in fact, backed McCarthy. Correlating income and employment statistics with voting records, Rogin found that the greater the employment in industry in a given Wisconsin county, the lower was McCarthy's share of the vote. Rogin concluded that the thesis of "McCarthyism as Populism" should be judged "not as the product of science but as a venture into conservative political theory".

American Society in the Eighteenth Century

American society in the eighteenth century operated according to the logic of a closed system. Whatever the scope of concern – a family, a community, a new nation, an empire – the guiding assumptions in each case established a framework of rules or principles, a container of truth that defined relationships and consequences inside its bounds. Sometimes the source of these principles lay in heavenly writ, sometimes in natural law, more often in some blend of the sacred and the secular. Always, however, they existed above and prior to human actions, and therefore they always stood ready as a measure of virtue in the present and a basis for prescriptions about the future. Rarely were these truths considered incomprehensible. Although ordinary citizens might require a learned elite to explain them, their meaning nevertheless fell within the ken of human reason. Hence, everyone was obligated to adapt their ways to these overarching rules, as they were commonly understood, and anyone could reasonably judge others, wherever they lived, by their degree of conformity to the same immutable principles.

Applying these principles was a delicate art that demanded quite different skills in a familiar, local setting than in a broad, impersonal one. The center of eighteenth-century society was the family in a community. Across an impressive American diversity, family and community interconnected in a great many forms, ranging from Mennonite settlements where the community almost swallowed its families to kinship systems in South Carolina and Virginia with a very loose attachment to a county seat or a region. Every variation, however, set family units to

manage the particulars of everyday life in a manner that constrained each unit by the values all of them held in common. These controls, in turn, were reinforced by an assumption of the community's permanence. People expected to spend a lifetime with the same faces, the same family names, the same pattern of institutions, the same routines of work and pleasure, and as they judged these intimate relations by their superstructure of truths, they drew upon an accretion of knowledge about individuals and families and customary ways to estimate, day by day, the state of their immediate society.

The farther their vision extended beyond the community however, the more people relied upon an explicit demonstration that the affairs concerning them in a wider environment were actually abiding by the correct principles. An obsession with the exact privileges of a colonial legislature and the precise extent of Britain's imperial power, the specifics of a state constitution and the absolute necessity of a federal one, all expressed this urge for a careful articulation as proof that the right relationship with external powers did indeed prevail. Unlike the calculations of a community's health, which gave significance to everybody's accumulated knowledge about their neighbors and their traditions, these broad applications of principle belonged almost exclusively to an elite. The more a wider world affected the life of a community, the more its members looked to an elite for mediation – to explain distant events, to negotiate with distant authorities. During times of crisis relationships inside a community that might otherwise have been quite fluid tended to solidify behind a very few leaders in order to meet an external danger.

The Study of Negro History

Paralleling the growth of interest among professional historians during the early 1960s was a simultaneous groundswell of popular interest in the Afro-American past that was directly stimulated by the drama of the protest movement. Sensing the "Negro Mood," the journalist Lerone Bennett wrote a series of articles on Afro-American history for *Ebony* and soon after brought them together in his popular volume, *Before the Mayflower* (1962). As the nonviolent direct action movement attained its crest in 1963-64, movement activists introduced black history units into the curricula of the "freedom schools" that accompanied the school integration boycotts. Meanwhile, boards of education began to address themselves to "the racial imbalance and neutralism of pusillanimous textbooks designed to appeal to Southern as well as Northern school adoption committees." In 1964 New York City's school board published *The Negro in American History*; Detroit's social studies teachers produced *The Struggle for Freedom and Rights: Basic Facts about the Negro in American History*. Franklin, surveying the activities among publishers, teachers, and school boards, called these beginnings of curriculum revision "one of the most significant byproducts of the current Civil Rights Revolution".

The relationship between these developments at the grass roots level and what was occurring in the scholarly world is of course indirect. Yet given the context of social change in the early 1960s, Negro history was now the object of unprecedented attention among wide segments of the American population, black and white. In academe nothing demonstrated this growing

legitimacy of black history better than the way in which certain scholars of both races, who had previously been ambivalent about being identified as specialists in the field, now reversed themselves.

Thus Frenise Logan, returning to an academic career, decided to attempt to publish his doctoral dissertation on blacks in late nineteenth-century North Carolina. A 1960 award encouraged him to do further research, and his expanded *The Negro in North Carolina, 1876-1894* appeared in 1964. It is true that as late as 1963 a white professor advised John W. Blassingame to avoid black history if he wanted to have "a future in the historical profession". Yet more indicative of how things were going was that 1964-65 marked a turning point for two of Kenneth Stamp's former students – Nathan Huggins and Leon Litwack. The changing intellectual milieu seems to have permitted Huggins, whose original intention of specializing in African and Afro-American history had been overruled by practical concerns, to move into what became his long-range commitment to the field. By 1965 when his interest in intellectual history found expression in the idea of doing a book on the Harlem Renaissance, the factors that earlier would have discouraged him from such a study had dissipated. For Litwack the return to Negro history was an especially vivid experience, and he recalls the day he spoke at the University of Rochester, lecturing on Jacksonian democracy. Some students in the audience, sensing that his heart was just not in that topic, urged him to undertake research once again in the field to which he had already contributed so significantly. He settled on the study that became *Been in the Storm So Long* (1979). In short, both Huggins and Litwack now left able to dismiss the professional considerations that had loomed so large in their earlier decision to work in other specialties and to identify themselves with what had hitherto been a marginal field of inquiry.

第五部分　　政治学、法律

Marx and Durkheim as Applied Sociologists

It is easy to accept Freud as an applied scientist, and, indeed he is widely regarded as the twentieth century's master clinician. However, in viewing Marx as an applied social scientist the stance needed is that of a Machiavellian operationalism. The objective is neither to bury nor to praise him. The assumption is simply that he is better understood for being understood as an applied sociologist. This is in part the clear implication of Marx's *Theses on Feuerbach*, which culminate in the resounding 11th thesis: "The philosophers have only interpreted the world in different ways; the point, however, is to change it." This would seem to be the tacit creed of applied scientists everywhere.

Marx was no Faustian, concerned solely with understanding society, but a Promethean who sought to understand it well enough to influence and to change it. He was centrally concerned with the social problems of a lay group, the proletariat, and there can be little doubt that his work is motivated by an effort to reduce their suffering, as he saw it. His diagnosis was that their increasing misery and alienation engendered endemic class struggle; his prognosis claimed that this would culminate in revolution; his therapeutic prescription was class consciousness and active struggle.

Here, as in assessing Durkheim or Freud, the issue is not whether this analysis is empirically correct or scientifically adequate. Furthermore, whether or not this formulation seems to eviscerate Marx's revolutionary core, as critics on the left may charge, or whether the formulation provides Marx with a new veneer of academic respectability, as critics on the right may allege, is entirely irrelevant from the present standpoint. Insofar as Marx's or any other social scientist's work conforms to a generalized model of applied social science, insofar as it is professionally oriented to the values and social problems of laymen in his society, he may be treated as an applied social scientist.

Despite Durkheim's intellectualistic proclivities and rationalistic pathos, he was too much the product of European turbulence to turn his back on the travail of his culture. "Why strive for knowledge of reality, if this knowledge cannot aid us in life," he asked. "Social science," he said, "can provide us with rules of action for the future." Durkheim, like Marx, conceived of science as an agency of social action, and like him was professionally oriented to the values and problems of laymen in his society. Unless one sees that Durkheim was in some part an applied social scientist, it is impossible to understand why he concludes his monumental study of *Suicide* with a chapter on "Practical Consequences," and why, in the *Division of Labor*, he proposes a specific remedy for anomie.

Durkheim is today widely regarded as a model of theoretic and methodologic sophistication, and

is thus usually seen only in his capacity as a pure social scientist. Surely this is an incomplete view of the man who regarded the *practical* effectiveness of a science as its principal justification. To be more fully understood, Durkheim also needs to be seen as an applied sociologist. His interest in religious beliefs and organization, in crime and penology, in educational methods and organization, in suicide and anomie, are not casually chosen problem areas. Nor did he select them only because they provide occasions for the development of his theoretical orientation. These areas were in his time, as they are today, problems of indigenous interest to applied sociologists in Western society, precisely because of their practical significance.

Karl Marx's Theory and Practice

With Friedrich Engels, Karl Marx in 1848 published the *Communist Manifesto*, calling upon the masses to rise and throw off their economic chains. His maturer theories of society were later elaborated in his large and abstruse work *Das Capital*. Starting as a non-violent revolutionist, he ended life as a major social theorist more or less sympathetic with violent revolution, if such became necessary in order to change the social system which he believed to be frankly predatory upon the masses.

On the theoretical side, Marx set up the doctrine of surplus value as the chief element in capitalistic exploitation. According to this theory, the ruling classes no longer employed military force primarily as a means to plundering the people. Instead, they used their control over employment and working conditions under the bourgeois capitalistic system for this purpose, paying only a bare subsistence wage to the worker while they appropriated all surplus values in the productive process. He further taught that the strategic disadvantage of the worker in industry prevented him from obtaining a fairer share of the earnings by bargaining methods and drove him to revolutionary procedures as a means to establishing his economic and social rights. This revolution might be peacefully consummated by parliamentary procedures if the people prepared themselves for political action by mastering the materialistic interpretation of history and by organizing politically for the final event. It was his belief that the aggressions of the capitalist class would eventually destroy the middle class and take over all their sources of income by a process of capitalistic absorption of industry – a process which has failed to occur in most countries.

With minor exceptions, Marx's social philosophy is now generally accepted by leftwing labor movements in many countries, but rejected by centrist labor groups, especially those in the United States. In Russia and other Eastern European countries, however, Socialist leaders adopted the methods of violent revolution because of the opposition of the ruling classes. Yet, many now hold that the present Communist regime in Russia and her satellite countries is no longer a proletarian movement based on Marxist social and political theory, but a camouflaged imperialistic effort to dominate the world in the interest of a new ruling class.

It is important, however, that those who wish to approach Marx as a teacher should not be "buffaloed" by his philosophic approach. They are very likely to in these days, because those most interested in propagating the ideas of Marx, the Russian Bolsheviks, have swallowed down his Hegelian philosophy along with his science of revolutionary engineering, and they look upon us irreverent peoples who presume to meditate social and even revolutionary problems without making our obeisance to the mysteries of Dialectic Materialism, as a species of unredeemed and well-nigh unredeemable barbarians. They are right in scorning our ignorance of the scientific ideas of Karl Marx and our indifference to them. They are wrong in scorning our distaste for having practical programs presented in the form of system of philosophy. In that we simply represent a more progressive intellectual culture than that in which Marx received his education – a culture farther emerged from the dominance of religious attitudes.

Liberties of Citizens

In the long run, a government will always encroach upon freedom to the extent to which it has the power to do so; this is almost a natural law of politics, since, whatever the intentions of the people who exercise political power, the sheer momentum of government leads to a constant pressure upon the liberties of the citizen. But in many countries society has responded by throwing up its own defenses in the shape of social classes or organized corporations which, enjoying economic power and popular support, have been able to set limits to the scope of action of the executive. Such, for example, in England was the origin of all our liberties – won from government by the stand first of the feudal nobility, then of churches and political parties, and latterly of trade unions, commercial organizations, and the societies for promoting various causes. Even in European lands which were arbitrarily ruled, the powers of the monarchy, though absolute in theory, were in their exercise checked in a similar fashion. Indeed the fascist dictatorships of today are the first truly tyrannical governments which Western Europe has known for centuries, and they have been rendered possible only because on coming to power they destroyed all forms of social organization which were in any way rivals to the state.

Retaining a Representative Government

When a people have no sufficient value for, and attachment to, a representative constitution, they have next-to-no chance of retaining it. Representative institutions necessarily depend for their permanence upon the readiness of the people to fight for them in case of their being endangered. If too little valued for this, they are almost sure to overthrow, as soon as the head of the government, or any party leader who can muster a force for a *coup de main*, is willing to run some small risk for absolute power.

These considerations relate the first two causes of failure in a representative government. The third is, when the people lack either the will or the capacity to fulfill the part which belongs to

them in a representative constitution.

When nobody, or only some small fraction, feels the degree of interest in the general affairs of the state necessary to the formation of a public opinion, the electors will seldom make any use of the right of suffrage but to serve their private interest, or the interest of their locality, or of someone with whom they are connected as adherents or dependents. The small class who, in this state of public feeling, gain the command of the representative body, for the most part use it solely as a means of seeking their fortune.

Aggregated Policies

Because some resources must be allocated at the national level, we have created policies which reflect the aggregated attributes of our society. The federal budget determines the proportion of federal resources to be invested in social welfare programs and how these resources are distributed among competing programs. This budget is arrived at through a reiterative aggregative political process which mediates the claims of groups interested in health, education, welfare, and so on, thus socializing the continuing conflict generated by their separate aspirations. The test of whether a policy is "good" under this system is whether it can marshal sufficient legitimacy and consent to provide a basis for cohesion and action. Technical criteria may play a role in the process, but the ultimate criteria are political and social.

Whether a policy that is "good" in the aggregate sense is also "good" for a particular person, however, is a different matter. If everyone had identical attributes, these criteria of goodness would produce identical outcomes. With any degree of complexity or change, however, these criteria will always produce different outcomes. Any policy negotiated to attain an aggregate correctness will be wrong for every individual to whom the policy applies. The less a person conforms to the aggregate, the more wrong it will be.

When a policy is not working, we normally assume that the policy is right in form but wrong in content. It had failed because insufficient intelligence has informed its construction or insufficient energy its implementation. We proceed to replace the old policy by a new one of the same form. This buys time, since some time must elapse before the new policy can fully display the same set of symptoms of failure as the old. We thus continue to invest our time, energy, and other resources as if every new discovery of a nonworking policy is a surprise, and a surprise that can be corrected with some reorganized model. But if policies based on complex, aggregated information are always wrong with respect to the preferences of every person to whom they apply, we should concentrate on limiting such policies to minima or "floors". Rather than trying for better policies, we should try for fewer policies or more limited aggregated ones. Such limitations could be designed to produce policies as spare and minimal as possible, for the resources not consumed in their operation would then be usable in nonaggregative, person-specific ways – that is, in a disaggregated fashion. This will require more than just strengthened "local" capacity; it will require the development of new procedures, institutions,

roles, and expectations.

Burnham's Theory

Most thinkers have distinguished three political entities: the individual, society, and the state. It is normal to begin with the individual and then to consider society as the embodiment of his nature as social being. Thus, the individual is considered to be both logically and historically prior to society and to the state. But in James Burnham's vision of the future state, the logical priority of the individual over the state is inverted. Burnham changed his mind on many points of detail between one book and the next, primarily because he thought that what was happening in national and world politics at any given moment was decisive. But his general sense of the form political power would take didn't move far from the version of it he gave in *The Managerial Revolution*. In that book he predicted that the weaknesses of capitalism would eventually prove fatal, but the downfall of capitalism would not be the victory the proletariat followed by a Marxist paradise. Capitalism would be replaced by autocracy even more extreme than that in Stalin's Russia. Under this autocracy, the instruments of production would be controlled by the state, and the state, in turn, would be controlled by a ruling elite of managers.

Burnham argued that managers would control the instruments of production in their own corporate favor, and the economy of state ownership would provide the basis for domination and exploitation by a ruling class of an extremity and absoluteness never before known. The masses would be curbed or constantly diverted so that they would, as we say, go along with the managerial arrangements. In Burnham's future state, history has come to an end because existence has removed itself from historical process and become pure essence, it attributes those of official meaning. Perfection is defined as the state of completeness in accordance with the terms prescribed for it by the state, as a proposition in logic or a theorem in mathematics might be faultless.

In *We*, Yevgeny Zamyatin envisaged a one-world state, but Burnham allowed for three. Three superstates would divide the world between them and would enter into shifting alliances with one another. In 1941, Burnham thought the three would be the United States, Europe, and Japan. The superpowers would wage war over marginal territory. "Ostensibly," Burnham said, "these wars will be directed from each base for the conquest of the other bases. But it does not seem possible for any one of these to conquer the others; and even two of them in coalition could not win a decisive and lasting victory over the third."

By 1974, several of Burnham's predictions has already proved false, a result of his irrepressible tendency to assume that present conditions would persist unchanged indefinitely; but a more damning indictment of his vision is the hypocrisy concealed behind the attack on power. Burnham was infatuated with the image of totalitarianism; he was fascinated by the power he attacked and he despised the democracy he should have defended. Ultimately, Burnham voiced the secret desire of the English intelligentsia to destroy the old, egalitarian version of Socialism

and usher in a new hierarchical society in which the intellectual could at last get his hands on the whip.

Liberal View of Democratic Citizenship

The liberal view of democratic citizenship that developed in the 17th and 18th centuries was fundamentally different from that of the classical Greeks. The pursuit of private interests with as little interference as possible from government was seen as the road to human happiness and progress rather than the public obligations and involvement in the collective community that were emphasized by the Greeks. Freedom was to be realized by limiting the scope of governmental activity and political obligation and not through immersion in the collective life of the polis. The basic role of the citizen was to select governmental leaders and keep the powers and scope of public authority in check. On the liberal view, the rights of citizens against the state were the focus of special emphasis.

Over time, the liberal democratic notion of citizenship developed in two directions. First, there was a movement to increase the proportion of members of society who were eligible to participate as citizens – especially through extending the right of suffrage – and to ensure the basic political equality of all. Second, there was a broadening of the legitimate activities of government and a use of governmental power to redress imbalances in social and economic life. Political citizenship became an instrument through which groups and classes with sufficient numbers of votes could use the state power to enhance their social and economic well-being.

Within the general liberal view of democratic citizenship, tensions have developed over the degree to which government can and should be used as an instrument for promoting happiness and well-being. Political philosopher Martin Diamond has categorized two views of democracy as follows. On the one hand, there is the "libertarian" perspective that stresses the private pursuit of happiness and emphasizes the necessity for restraint on government and protection of individual liberties. On the other hand, there is the "majoritarian" view that emphasizes the "task of the government to uplift and aid the common man against the malefactors of great wealth." The tensions between these two views are very evident today. Taxpayer revolts and calls for smaller government and less government regulation clash with demands for greater government involvement in the economic marketplace and the social sphere.

Open Government Statutes

Open government statutes in California have proved both beneficial and harmful. In the energy commission, for example, as in other government commissions, nearly all decisions must be made in public session for which at least seven days' notice must be given. (Two notable exceptions to public participation in commission meetings are meetings held to discuss pending

litigation and meetings held to discuss staff personnel matters.) The determination of which decisions can be made by the executive director and which are strictly reserved for the commission becomes quite important in this context. If something is a matter for the commission, there must be a public hearing with attendant publicity and preparation of materials for distribution at the meeting. (A formal delegation of authority authorizes the executive director to make purchases of goods and services, including consulting services, costing less than $ 5,000.)

Furthermore, no more than three of the commission's five commissioners may meet informally with one another or with the executive director or any member of his staff to discuss commission activities. Such behavior would be a violation of open government statutes. Staff briefings must take place commissioner by commissioner or through a commissioner's advisers. More frequently, commissioners or their advisers contact the staff for information, but all such requests must be submitted in writing.

An example of the impact of open government on the operating procedures of a commission is the energy commission's budgetary process. The budget for the commission, unlike that prepared in other state agencies, was prepared in public session by the five commissioners. The session was not simply a "review and comment" session, since the commissioners had not previously discussed the budget. Every item proposed for the budget could be commented on by anyone who attended the hearings. The budget was then forwarded to the governor's office prior to submission to the legislature as part of the executive budget. In a recent case involving development of regulations to ban use of gas pilot lights in new equipments sold in the state, much of the actual development of the regulations was performed by an advisory committee of both environmental and industry representatives in public workshops.

Perhaps open government's effect has been greatest in the promulgation of rules and regulations. Complaints have arisen from several legislators and the news media about the slowness of the energy commission in setting regulations. In fact, the commission may be unable to meet the original legislatively mandated deadlines for several sets of regulations, including standards for newly constructed nonresidential buildings. If, however, a commission attempts to handle some matters without input from state agencies and interested groups in open meetings, it will be criticized for circumventing the open government intentions of the legislation. Thus, if present practices continue, the commission will continue to be criticized for moving too slowly; but if it attempts to move more quickly, the commissioners open themselves up to charges of attempting to circumvent the letter and spirit of the open government law.

Social Welfare Cutback

It is commonly asserted that an ideology is powerless against political interest groups and against the unflagging tendency of established social institutions to expand. To dispute this claim, however, we need only look to the present day political situation. There is, at the present time, unfortunate political revolution underway among Western countries that is occurring in spite of

potent political opposition.

For most of the postwar period, there was a proliferation of government social welfare programs designed to raise the income share of the poor. Such programs serve, in various forms, to redistribute wealth among the population at large, generally taking from those who are better situated and giving to those who are economically disadvantaged. As a result of their implementation, the plight of the poor was ameliorated to an even greater degree than was expected.

Despite these positive advances, one school of ideology, known as *redistributional retrenchment*, has long argued that the gains from redistribution programs are far outweighed by adverse economic side-effects. In the wake of the worldwide slowdown in economic growth following the first oil embargo of 1973, these arguments have been treated with increasing respect, resulting in deliberate government curtailing of social welfare spending. As a consequence, in the United States, England, Germany, and even in the Netherlands and Scandinavia, public income transfer programs have been or are being cut back. On the face of it, only France and Italy seem to be resisting the trend; Switzerland, though it partook in the rapid expansion of the earlier period, has temporarily reached a plateau in spending. The political mentality that supports redistributional retrenchment now holds considerable sway. As a consequence of the deliberate government curtailment of social welfare spending, the Western poor are measurably worse off today than they were just a decade ago.

In addition, every dollar cut from the budget of such programs reduces the government payroll by twenty cents. Thus, the curtailment of social welfare programs has caused a decrease in the number of government jobs. The resulting unemployment has not been fully absorbed by the private sector. There is, then, in addition to the many poor whose benefits have been cut, a large number of middle-income citizens who oppose redistributional retrenchment.

Given those facts, one would expect everyday political forces to reverse this trend of social welfare cutbacks. Yet no reversal has occurred. Counting on fundamental principles of democracy and the ultimate power of the vote, political hopefuls have sought to attain office by appealing to such people and addressing the genuine economic distress they are experiencing. Their efforts have, for the most part, failed. Indeed, those government legislators, administrators, and executives who felt confident that they would succeed in abating the trend, simply because the number of voting citizens who stood to suffer was so large, underestimated the power of the redistributional-retrenchment ideology. It continues to advance notwithstanding the adverse effect it has had on huge sectors of the population.

Montesquieu's Theory of Government

It is important to note the ways in which Montesquieu's classification of the forms of government in *The Spirit of the Laws* departed from the classical tradition.

Montesquieu's first originality was to regard democracy and aristocracy (which in Aristotle's classification are two separate types) as two modes of a form of government called republican. For Montesquieu, the fundamental distinction is between the republic, including the two modes of aristocracy and democracy, and the monarchy. According to Montesquieu, Aristotle was unaware of the true nature of monarchy – which is understandable since monarchy, as Montesquieu conceived it, had been achieved only in postclassical Europe.

There is an underlying reason for this departure. In Montesquieu, the distinction between forms of government is also a conscious distinction between social organizations and structures. Aristotle had created a theory of forms of government to which he had apparently assigned a general validity, but he was presupposing the Greek city-state as its social basis. Monarchy, aristocracy, and democracy constituted the three modes of political organization of the Greek city-states. It was justifiable, in this context, to distinguish types of government according to the number of persons holding the sovereign power. But this kind of analysis really implied that these three forms of government were, in modern terms, the political superstructure of a certain type of society.

In classical political philosophy, no one bothered to examine the relationship between the types of political superstructure and the social foundations. No one had clearly formulated the question of to what extent a classification of political regimes can be made without considering the organization of societies. Montesquieu's decisive contribution was precisely to combine the analysis of forms of government with the study of social organizations in such a way that each regime is also seen as a certain type of society.

How did he establish this relationship between government and society? First Montesquieu stated explicitly in Book VIII, Chapters 16, 17 and 19, that each of these three forms of government corresponds to, or is consistent with, a certain dimension of the society under consideration. Here is Montesquieu's most typical pronouncement, from Book VIII, Chapter 16: "It is natural for a republic to have only a small territory; otherwise it cannot long subsist."

A little further on he says: "A monarchical state ought to be of moderate extent." Finally, a third passage, from Chapter 19 of Book VIII: "A large empire supposes a despotic authority in the person who governs."

If we wished to translate these formulas into strictly logical terms, we should probably have to abandon a vocabulary of causality. We would be unable to say that once the territory of a state exceeds a certain size, despotism is inevitable, but at least we could say that there is a natural correspondence between the size of the society and the type of government. In any case, it is by means of this theory of size that Montesquieu linked the classification of governments to what is now called social morphology, in Durkheim's term.

Evolution of Federal Budgetary System

The basic character of our governmental and political institutions conditions the federal budgetary system. The working relationships between branches, and between the elements within each branch, are intricate, subtle, and in continuous change – affected by partisan politics, personalities, social forces, and public opinion. A few landmark stages in the evolution of the present system provide perspective.

In 1789 Alexander Hamilton, as the first Secretary of the Treasury, affirmed and successfully established a position of strong executive leadership in matters of public finance. His proposals on revenues, banking, and the assumption of prior debts of both national and state governments were based on his philosophy that federal fiscal policies should be designed to encourage economic growth. However, Hamilton's successors, and the Presidents under whom they served, did not follow his concept of executive responsibility for "plans of finance."

Partly through default, Congress took charge of all phases of fiscal policy. At the outset, each chamber was so small that coherent initiative was possible. (The first House had some 60 members – about the number of its present Appropriations Committee.) Spending estimates, considered in Committee of the Whole in 1789, were later referred to the Committee on Ways and Means. In 1865 expenditures were assigned to a new Appropriations Committee while revenues remained with the Ways and Means Committee. In 1885 most spending proposals were subdivided among the legislative committees so that appropriation bills came to be handled by numerous committees (14 in the House and 15 in the Senate), each dealing directly with the departments. The presidential role was minimal.

By the turn of the century there was a clear need for reform in financial management. At all levels of government, officials spent money on activities "as authorized by law" and in line with "appropriations" made by legislative bodies – usually after committee consideration. Other officials collected taxes and fees under various unrelated statutes. Such a system – or lack-of-system – worked within reason as long as governments had little to do. But as government activities grew, becoming more technical and closely interrelated, this lack-of-system bogged down.

Several factors played a part in the eventual breakthrough. In the first decade of the twentieth century, an "executive budget" came into successful use by some cities and states. President Taft's Commission on Efficiency and Economy prepared an illustrative federal budget which – while rejected by Congress – commanded broad public support. The more advanced methods developed by European government came to American attention. World War I precipitated accounting chaos, with an aftermath of scandal. The need for new and better methods was established beyond dispute.

The Budget and Accounting Act of 1921 placed direct responsibility for preparation and execution of the federal budget upon the President, making a unified federal budget possible for the first time. The Act set up two new organizational units, the General Accounting Office (GAO) and the Bureau of the Budget. GAO is headed by the Comptroller General, appointed by the

President with Senate approval for a 15-year term, and is regarded as primarily a congressional rather than an executive resource. The Bureau, under a Director appointed by the President *without* Senate confirmation and serving at his pleasure, has from its inception been the President's chief reliance in budgetary and related matters.

Presidential Appointments

The main burden of assuring that the resources of the federal government are well managed falls on relatively few of the five million men and women whom it employs. Under the department and agency heads there are 8,600 political, career, military, and foreign service executives – the top managers and professionals – who exert major influence on the manner in which the rest are directed and utilized. Below their level there are other thousands with assignments of some managerial significance, but we believe that the line of demarcation selected is the best available for our purposes in this attainment.

In addition to Presidential appointees in responsible posts, the 8,600 include the three highest grades under the Classification Act; the three highest grades in the postal field service; comparable grades in the foreign service; general officers in the military service; and similar classes in other special services and in agencies or positions excepted from the Classification Act.

There is no complete inventory of positions or people in federal service at this level. The lack may be explained by separate agency statutes and personnel systems, diffusion among so many special services, and absence of any central point (short of the President himself) with jurisdiction over all upper-level personnel of the government.

This Committee considers establishment and maintenance of a central inventory of these key people and positions to be an elementary necessity, a first step in improved management throughout the Executive Branch.

Top Presidential appointees, about 500 of them, bear the brunt of translating the philosophy and aims of the current administration into practical programs. This group includes the secretaries and assistant secretaries of cabinet departments, agency heads and their deputies, heads and members of boards and commissions with fixed terms, and chiefs and directors of major bureaus, divisions, and services. Appointments to many of these politically sensitive positions are made on recommendation by department or agency heads, but all presumably responsible to Presidential leadership.

One qualification for office at this level is that there be no basic disagreement with Presidential political philosophy, at least so far as administrative judgments and actions are concerned. Apart from the bi-partisan boards and commissions, these men are normally identified with the political party of the President, or are sympathetic to it, although there are exceptions.

There are four distinguishable kinds of top Presidential appointees, including:

– Those whom the President selects at the outset to establish immediate and effective control over the government (e.g., Cabinet secretaries, agency heads, his own White House staff and Executive Office Personnel).

– Those selected by department and agency heads in order to establish control within their respective organizations (e.g. – assistant secretaries, deputies, assistants to, and major line posts in some bureaus and divisions).

– High-level appointees who – though often requiring clearance through political or interest group channels, or both – must have known scientific or technical competence (e.g. – the Surgeon General, the Commissioner of Education).

– Those named to residual positions traditionally filled on a partisan patronage basis.

These appointees are primarily regarded as policy makers and overseers of policy execution. In practice, however, they usually have substantial responsibilities in line management, often requiring a thorough knowledge of substantive agency programs.

Government Patronage for Science and Arts

One of the most rapidly expanding sectors in American life since World War II has been the government. Local, state, and national government expenditures for goods and services rose from 13% of the gross national product in 1950 to 23% in 1970, reflecting a sixfold absolute increase in government spending. The expansion was not limited to traditional domains, such as defense and welfare. New target areas of government spending include the physical sciences, social sciences, and the arts. Federal outlays for research in the physical sciences rose from $ 0.6 billion in fiscal 1956 to $ 2.9 billion in 1963 and $ 3.8 billion in 1973. Federal support of social science research, which stood at $ 30 million in 1956, reached $ 412 million in 1973 (National Science Foundation, 1970: 243; 1974a: 149). Expenditures by the National Endowment for the Arts (1973: 111-112) evidenced a similar trend: initially appropriated $ 3 million during its first year of operation in 1966, the National Endowment's budget reached $ 15 million in 1971 and $ 61 million by 1974.

The institutions engaged in artistic or scientific activity are centrally concerned with the maintenance and extension of cultural systems (Parsons, 1961; Peterson, 1976). The growth of government patronage for these areas suggests that the facilitation and production of culture has become a major state activity in the United States. The objectives underlying this state intervention are not well understood. The central purpose of this paper is to evaluate the relative strengths of several alternative explanations for the government's involvement in the production

of culture. A second purpose is to suggest the likely impact of government patronage on the physical sciences, social sciences, and arts in America.

Four distinct models for explaining the state's growing interest in the production of culture can be identified. One model emphasizes the value of patronage for the maintenance of the cultural institutions in question. A second model stresses the utility of the investment for capital accumulation. A third model points toward the value of supporting science and art for the administration of government programs. The fourth model identifies the ideological potential of science and art as a primary reason for government patronage.

Science and art for their own sake. The first model of government patronage is predicated on the structural-functionalist assumption that the government is a relatively neutral instrument for the articulation and pursuit of collective goals in a society with relatively autonomous subsystems (Parsons, 1969). Pure science and art are vital societal subsystems, and the government moves to protect and develop these areas to ensure the continued production of culture for the benefit of all members of society. Thus, the government intervenes directly as the final patron of public goods that would otherwise be unavailable. Increasingly, the paradigms (Kuhn, 1970: 175) in science and art dictate expenditures that increasingly outstrip the resources of the institutions themselves. Equipment, staff, and data-processing costs of physical science research far exceed the commercial potential of most scientific projects; the cost of conducting systematic and reliable social scientific investigations can no longer be met through product marketing or private foundations; what is more, artistic organizations are increasingly incapable of underwriting all production costs through income and contributions. Under these conditions, government patronage is introduced to ensure the flow of cultural goods to society.

Two important corollaries follow from this formulation, which make it empirically testable. First, the timing of government intervention should primarily be related to economic crises faced by the arts and science themselves, not to crises in the political system, economy, or elsewhere. Second, government intervention should generally take the form of protecting the paradigm of the arts and sciences. Specifically, federal funding should be allocated to the most creative artists and organizations, as defined by the relevant artistic community. Similarly, funding should be preferentially bestowed on scientists whose research is making the greatest contribution to the advance of the scientific discipline, regardless of its relevance for outside problems or crises.

Political Shows

Seventy-five years after the death of Louis XIV, the French Revolution enlarged considerably the dimensions of the government show, organizing mass demonstrations with grandiose staging. The national holiday on July 14, 1790, attracted 200,000 people to the Champs de Mars. Robespierre held the main role as president of the Convention. While choirs intoned a specially composed hymn entitled "Father of the Universe, Supreme Intelligence," he lighted the flame before a statue of Atheism. Then, marching at the head of the column of members of the

Convention, with each member carrying a bouquet of flowers and ears of wheat, he proceeded from the Toilers Gardens to the Champs de Mars, where a symbolic hillock topped with Tree of Freedom had been erected.

The objective of these vast liturgical assemblies? To strike the public imagination, mobilize it, and involve it in a collective ritual. Later, mass demonstrations in Red Square or Tiananmen Square would be held for the same reason. Participation in such rituals has become an act of allegiance to official beliefs. Other regimes, like fascism or Nazism, aim at not only raising the consciousness of the people, but at creating a "mass psychology" by using gigantic demonstrators, whether in Rome or in the stadium at Nuremberg. Here, following Durkheim’s theory, the demonstration has the double aspect of ceremony-spectacle and diversion. It is diversion also in the sense of diverting attention away from the true problems and realities. The public lives in a surrealistic atmosphere of festivals and games, like plebeians during the Roman Empire.

Other political systems also mix show business and politics in a minor way. American elections are the occasion for confetti, parades, and majorettes, and each national political convention has a show business style orchestra. For that matter, political rallies are often held in places generally reserved for sports events like Madison Square Garden in New York, where the Democratic Convention was held, or the Walnut Street Theater in Philadelphia, where the first Ford-Carter debate was held. And, as with a show, we speak of the "public" to designate the people. Some refer to what they consider to be the public's taste for theatricalization, arguing that politics must use star system techniques to save it from the public's lack of interest, to adapt it to "mass culture". From the moment when the television viewer can choose between his president, a film, and a variety show, the president has to become an entertainer to compete effectively with show business professionals and keep his popularity rating. In short, to compete with stars, political stars have to use their methods and personalize their "performances".

Forms of Government

More than two thousand years ago, Aristotle utilized two major criteria in classifying governments. One was the *number of persons* in which governing authority vested; the other, the *primary purpose* toward which the exercise of governmental powers is directed.

In terms of the first criterion Aristotle distinguished three forms of government, viz., government by the one, by the few, and by the many. The second basis of classification, i.e., purpose, led him to differentiate "true" from "perverted" forms. True forms of government are characterized by the exercise of governmental authority for the benefit of all members of the body politic, whereas perverted types are featured by the use of governing power to promote the special and selfish interests of the ruling personnel. Government by the one for the benefit of all is kingship or royalty; government by the one for his private advantage is tyranny. Government by the few, if conducted for the purpose of promoting the common welfare, constitutes aristocracy. If the few

rule in furtherance of their own selfish interests, the government is an oligarchy. The dominant few are likely to be men of property interested in increasing their wealth. Finally, government by the many (the citizens at large) for the benefit of all was identified as polity or constitutional government, whereas government by the many, usually the poor or the needy, for the purpose of promoting their selfish interests, was named democracy, a perverted form of government.

Unlike Aristotle, contemporary political scientists usually classify forms of government without introducing a test of purpose or motivation with respect to the use of governmental powers. Definitions of democracy, for instance, seldom include stipulations concerning the objectives to be attained by a government of the democratic type. However, an underlying assumption, even though unstated, seems to be that democratic processes of government probably will result in promotion of the common welfare.

Aristotle conceived of government by the many, whether of the true or perverted variety, as involving direct action by the body of qualified citizens in the formulation and adoption of policies. Hamilton and Madison, in their comments about democracy in the Federalist Papers, revealed a like conception of the nature of democracy. Thus Madison distinguished between a republic (representative government) and pure democracy. In his words a pure democracy is "a society consisting of a small number of citizens, who assemble and administer the government in person." A distinction is still drawn between direct and indirect democracy, but emphasis now is placed on the latter form, that is, democracy of the representative variety. Although direct democracy survives in a few small communities, e.g., New England towns and some of the cantons of Switzerland, representative democracy prevails in communities of large size. Consequently, the term democracy as used today almost always signifies a democratic government of the indirect or representative type.

A Supreme Court Ruling

Mary Hamilton, a twenty-eight-year-old black field secretary for the Congress of Racial Equality (CORE), participated in a demonstration in Gadsden, Alabama, in 1963. White police officers arrested her, along with fellow demonstrators. Believing their arrests to be unlawful, the group petitioned the Circuit Court of Etowah Country for release on a wit of habeas corpus (unlawful imprisonment). The hearing on the petition was held on June 25, before Judge Cunningham, a white judge, assisted by white court clerks and bailiffs.

Black attorneys Charles Conley and Norman Amaker represented the petitioners and white Solicitor Rayburn spoke for the state. Mr. Rayburn followed the southern establishment practice of addressing each black witness by his or her first name, despite objections from the opposing counsel.

When Mary Hamilton completed her direct testimony, Solicitor Rayburn began his cross-examination by asking, "What is your name, please?"

"Miss Mary Hamilton."

"Mary – who were you arrested by?"

"My name is Miss Hamilton. Please address me correctly," she said.

"Who were you arrested by, Mary?" the solicitor asked again, deliberately.

"I will not answer a question –" she began, and Attorney Amaker interjected, "the witness's name is Miss Hamilton."

"– your question until I am addressed correctly," she finished.

"Answer the question," Judge Cunningham" ordered.

Miss Hamilton would not be intimidated. "I will not answer them unless I am addressed correctly."

"You are in contempt of court," ruled the judge.

"Your Honor – your Honor –" Attorney Conley began, but the judge paid no attention.

"You are in contempt of this court," he went on, "and you are sentenced to five days in jail and a fifty-dollar fine."

Miss Hamilton was taken to jail then and there, and served the five days. Since she did not intend to pay the fine, and therefore would be subject to another twenty days in jail, she was allowed out on bond to appeal the contempt conviction.

On July 25, she petitioned the Alabama Supreme Court to review the contempt citation on two grounds. Her lawyers contended that the solicitor's manner of addressing black witness violated the equal protection clause of the Fourteenth Amendment. Finding no cases on this point, they relied on logic, history, and etiquette. They rejected the state's reliance on Emily Post and Amy Vanderbilt because their books did not discuss the use of first names in a racial situation. They also reminded the court that Miss Hamilton's contempt conviction violated the due process clause because she was summarily sentenced without even being given a trial – an opportunity to present a defense to the charge. (Remember the Red Queen in *Alice in Wonderland* – "sentence first, trial afterward"?) The Alabama Supreme Court found, however, that "the question was a lawful one and the witness invoked no valid legal exemption to support her refusal to answer it."

The NAACP Legal Defense and Educational Fund then took the case up to the United States Supreme Court for review. The defense lawyers relied on long-standing principles governing the conduct of prosecuting attorneys: as quasi-judicial officers of the court they are under a duty not

to prejudice a party's case through overzealous prosecution or to detract from the impartiality of courtroom atmosphere. The defense presented historical and sociological proof that the forms of address used by Solicitor Rayburn were a distinct part of a "racial caste system" that deprived black citizens of equal protection of the laws. They also quoted from novels by Richard Wright, James Baldwin, and Lillian Smith. The United States Supreme Court handed down a summary decision the same day. Six justices joined in an order reversing Miss Hamilton's contempt citation.

Community Property

Community property is a legal concept that is growing in popularity in the United States. A few years ago only the western states had community property laws and few people east of the Mississippi had ever heard the expression "community property." Now several states have adopted or modified laws regarding community property.

Community property is jointly owned by both wife and husband. Generally, the property that was owned by a spouse before the marriage is known as separate or specific property. It remains the property of the original possessor in case of a separation or divorce. Community property is anything gained by the joint effort of the spouses.

Gifts specifically bestowed upon only one party, or legacies to only one spouse, are separate property. However, courts often determine that a donor had the intention to give the gift to both parties, even though his words or papers may have indicated otherwise. Community property goes to the surviving partner in case of the death of one spouse. Only that half of the property owned by the testator can be willed away.

Jury

A fundamental element of the American criminal justice system is trial by an impartial jury. This constitutionally protected guarantee is made meaningful by allowing the defendant to challenge and have removed from the panel those prospective jurors who are demonstrably prejudiced in the case. Such prejudice may be based on a juror's having some tangible interest in the case or on his relationship to the participants. Beyond this, a juror may be challenged if the defendant can show that the juror has preconceptions about the issues or parties that would prevent him from rendering a verdict based solely on the law and the evidence put forth at trial. In order to enable the defendant to discover these disqualifying factors, prospective jurors are subjected to questioning by the court or counsel or both. This interrogation is known as the *voir dire* examination. Generally, the courts have recognized that any prejudice affecting the ability of a juror to decide a case fairly is a sufficient ground for a challenge. Such prejudices can be categorized in two basic ways: as a bias implied as a matter of law and as actual bias. The former

may include such objective factors as a juror's relationship to a participant in the trial, whereas the latter may involve such subjective characteristics as racial, religious, economic, social, or political prejudices that would prevent the juror from trying the case fairly.

There is, however, a fundamental disagreement as to the extent to which the *voir dire* examination does, in fact, uncover juror prejudice. It has been suggested that once the prospective jurors are in the courtroom, they feel that disqualification for bias would impugn their integrity, and may, therefore, be willing to lie to avoid removal from the panel.

While it may be true that people will not invariably answer truthfully on *voir dire*, the same may be said of other stages of the trial. That witnesses do not always testify truthfully at trial compels neither the conclusion that it is useless to examine or cross-examine them nor the conclusion that the trial process itself is invalid. Similarly, the recognition that prospective jurors may at times suppress what they know to be their own weaknesses need not lead to the determination that the *voir dire* process itself is worthless. There is, for the most part, an absence of both explicit statutory guidelines and clear Supreme Court rulings indicating what specific inquires must be made if *voir dire* is to fulfill its constitutional function. What the Constitution requires, and will be held to require, of juror interrogation as to, for example, racial prejudice is unclear. Recent case law suggests, however, that policy considerations and perhaps the Constitution itself, call for some degree of direct and specific questioning as to not only racial bias, but also as to other common sources of prejudice as well.

Use of Deadly Force

From the fifteenth century to the present, the justification for using deadly force in the apprehension of suspected criminals has been based largely on the legal distinction between a felony and a misdemeanor. Law enforcement officers may use deadly force to prevent the escape of fleeing felons, but they may not use it to apprehend fleeing misdemeanants.

The rationale for permitting deadly force to be used against felons, at least in early common law and in eighteenth-century America, was that all felonies – murder, rape, robbery, burglary, arson, and a few other serious crimes – were punishable by death. Hence, it made little difference if suspected felons were killed while they were being apprehended because, in the eyes of the law, they had already forfeited their lives by committing serious crimes. Deadly force was seen merely as a means of expediting the judicial process.

Today, this rationale no longer obtains. Most states recognize various classes of felonies (Class A, Class B, and so on), ranging from the most serious to the least serious, and not all of these felonies are punishable by death. In fact, some are punishable by as little as a year and a day in prison. Neither do all offenses now classified as felonies involve the use or threat of physical force or violence. Fraud and embezzlement, for instance, are nonviolent felonies; so are tax evasion and a number of other so-called "white-collar" crimes. Since the primary distinction

between a felony and a misdemeanor in current federal law is a technical one (the length of the sentence imposed upon conviction) and since some misdemeanors are more dangerous than some felonies, it is unreasonable to base the justification for the use of deadly force on the apprehension of suspected offenders on this distinction alone.

Law enforcement officers in pursuit of fleeing suspects are called upon to make difficult on-the-spot judgments. The facts available to them are often vague, incomplete, and ambiguous, yet their decisions must be both swift and sound. They should not be based on a legal distinction that fails to discriminate among felonies of varying degrees of danger and seriousness. Rather, they should be based on the nature of the felony and the circumstances surrounding the flight. If the felony is a violent one and the circumstances are life threatening – that is, if the fleeing suspect uses or threatens to use deadly force to avoid apprehension – then the use of deadly force by a law enforcement officer may be justifiable. However, other, less drastic measures should always be considered first.

Privacy Protection Act

The Privacy Protection Act was the response of Congress to the 1978 Supreme Court decision in *Zurcher* vs. *Stanford Daily*. *Zurcher* involved the issuing of a search warrant against the premises of an innocent party, the student newspaper of Stanford University, in an attempt to seize photographs of a demonstration that had occurred earlier at a local hospital. Several police officers had been injured by the demonstrators, and it was believed that the *Stanford Daily* possessed photographs that could assist in identifying the officer's assailants.

When the *Stanford Daily* sued the officers who searched their premises for these photographs, the U.S. Supreme Court held that the Constitution does not bar the use of a search warrant for premises occupied by a person who is not a suspect in a crime. As long as probable cause exists to believe that evidence is located in the place to be searched, a search warrant may properly be issued.

The opinion was quickly criticized by many segments of the press. Some even called it the opening wedge in the creation of a totalitarian state. Within days, legislation was introduced to limit warrant-authorized searches of the premises of those engaged in activities protected by freedom of the press. And in 1980 Congress passed the Privacy Protection Act.

Stated briefly, the act makes it unlawful for officers investigating a crime to search for or seize "work product" or "documentary materials" possessed by a person in connection with or for the purpose of disseminating a public communication, such as a newspaper, magazine, or book publication, or a television or radio broadcast.

"Work product" is defined as any material created in anticipation of public communication, including notes, that contains the mental impressions, conclusions, opinions, or theories of the

person who created it. To qualify as work product, the material need not have been prepared by the person in possession of the material. Thus, a report revealing government corruption made by a "whistle blower" working for a federal agency and mailed to a newspaper for possible publication would constitute work product.

"Documentary materials" are defined as any materials upon which information is recorded that are held by a person in connection with making a public communication. They include printed materials, photographs, films, video and audio tapes, and electronically recorded tapes or discs. Documentary materials may have been routinely prepared by others with no intent to publish and thus may contain no impressions, opinions, or theories of the person who intends to make them public.

Although the distinction between work product and documentary materials may sometimes be unclear, it is important, because the act affords a higher level of protection to work product than to documentary materials. It outlines certain exceptional circumstances in which authorities may legally search for either work product or documentary materials, and the range of these circumstances is greater in the case of documentary materials.

The Impeachment Clause in American Constitution

Clearly, the framers of the Constitution did not intend to adopt wholesale the British practice regarding impeachment, for they deliberately rejected several aspects of that practice. Thus, the proper source of law to use to determine what the framers meant by "high crimes and misdemeanors" as the basic ground for impeachment is uncertain.

Extremely significant is the fact that the British Parliament could and did, at its discretion, impose a criminal penalty in the course of impeachment. Hence, we cannot intelligently claim that American impeachment can go beyond criminal offenses on the basis of the fact that the antecedent British practice did so. Granted the power of Parliament to impose a criminal penalty, any British impeachment could be potentially "criminal." Thus, there was no occasion for the British to speculate about whether impeachment could be based on noncriminal charges, which is the insistent American question.

At the same time, the American concept of impeachment, even on a criminal basis, may not encompass all crimes. The draft impeachment clause considered by the framers at one point specified crimes "against the United States" as due cause for impeachment. The deletion of that phrase, as a matter of style, does not change the apparent intent that only public-oriented offenses be impeachable.

Even assuming that the framers intended to define the phrase "high crimes and misdemeanors" with reference to British impeachment practice, what that practice was is very unclear. Blackstone asserted that impeachment reached only crimes. On the other hand, it appears that

until after 1695, the British in fact impeached certain officers for high crimes and misdemeanors, sometimes attaching criminal penalties, when their conduct did not violate the ordinary criminal law.

However, British practice since 1715 seems to have limited the grounds for impeachment to conventional crimes. That apparent narrowing of the basis for impeachment is not unusual in the light of the major purpose that impeachment served in England. Initially, that purpose was to establish the doctrine of ministerial responsibility to the Parliamentary in executing the law, the king himself being above the law. By 1721, however, with parliamentary supremacy over the crown relatively firmly established, impeachment was a dying institution. Whereas fifty impeachment trials were held in Great Britain between 1620 and 1775, only four have been held since that date.

Thus, it appears that the British did not have a uniform, consistent definition of "high crimes and misdemeanors" in cases of impeachment. Rather, that concept changed as parliamentary government replaced royal government. Because it is so uncertain whether the framers intended to adopt the British definition of "high crimes and misdemeanors" and exactly what the British definition was at any given time, the purpose of impeachment as expressed by delegates to the Constitutional Convention, the terms they rejected as a basis for impeachment, and the text of the Constitution itself are the most reliable guidelines to use in determining what the framers meant by "high crimes and misdemeanors."

Judicial Determination of Employment Discrimination

Civil rights law has two markedly different legal standards for determining when illegal discrimination has occurred: the "intent" and the "effects" standards. In "intent" cases, the courts have developed a variety of way to determine whether intentional discrimination exists, since few decision makers publicize their discriminatory intent. Primary among these is numerical evidence of unequal results, because "in many cases the only available avenue of proof is the use of statistics to uncover clandestine and covert discrimination" (International Board of Teamsters v. United States, 1977).

In "effects" cases, however, numerical evidence is not used to assess the likelihood that the accused discriminator has intentionally caused harm to the victim on the basis of race, national origin, or sex, because the intent of the discriminator is not determinative. In these cases, numerical evidence serves to expose the existing unequal conditions in our society, whether they are caused by one discriminator or many, intentionally or not.

Perhaps the single most important decision in the evolution of equal employment opportunity law, *Griggs v. Duke Power Co.*, best explains this significant difference between an "intent" and an "effects" standard. In *Griggs*, the Supreme Court interpretation of Title VII of the 1964 Civil Rights Act invalidated general intelligence tests and other criteria for employment that

disproportionately excluded minorities, on the ground that these selection devices were not shown to be dictated by "business necessity." Although the lower courts had found that Duke Power's tests were not deliberately discriminatory, the Supreme Court concluded: "Good intent or absence of discriminatory intent does not redeem employment procedures or testing mechanisms that operate as 'built-in headwinds' for minority groups and are unrelated to measuring job capability." All employment selection mechanisms that have a "disparate effect" – that screen out a percentage of minorities or women disproportionate to that of whites or males when compared to their presence in the relevant labor market – are not unlawful. *Griggs* establishes, however, that the employer must demonstrate that practices with an adverse impact on the opportunities of minorities and women do, in fact, fairly measure or predict actual performance on the job.

Numerical evidence of unequal results, then, is not conclusive proof that illegal discrimination has been committed. Under the effects tests, the actions that produced such results may be lawful if the challenged decision maker can show that there was no reasonable alternative other than to perpetuate the unequal results. Nor is evidence of unequal results likely to be scrutinized by federal enforcement agencies if the outcome of the total selection procedure – its "bottom-line" statistical profile – is acceptable, even though individual components of that selection procedure may be illegal.

Legal Services

Planners of legal services programs need to be keenly aware of the social and economic problems of the community, the geographical areas and the population groups most in need of services, and local political factors that will affect the operation of the program. If a legal services program is to be effective, decisions concerning its operation should not be subject to the pulls of competing interests. Safeguards against undue influence of political or other community power groups, therefore, should be built into the program structure.

Some of the early demonstration projects of the 1960s received excellent support from political leaders. In other cases, political opposition seriously interfered with the operation of the programs. In one community, a committee on poverty appointed by the mayor launched a full-scale attack on the community action program that was the parent organization of the legal services unit. Subversion and misuse of funds were alleged. Even though the attack was not directed against the legal services unit itself, the atmosphere of tension and the curtailment of funds to the parent organization that resulted were felt by some staff members of the unit to have handicapped its programs. The community action program had helped give birth to various organizations of local residents, such as tenants' councils, which, in turn, were sources of cases in controversial areas. After the attack on the program, there was a drop in the number of requests for legal defense of tenants who withheld rent payments as a means of forcing slum landlords to repair property that did not meet standards set by the city building codes. Such defense is authorized by the state's real property law, but fear of political retaliation appeared to engender

hesitation on the part of both the community action program staff and the local tenants' groups to press this important, precedent-setting issue.

In some communities, top positions in legal assistance programs have traditionally been political appointees. This policy can create problems of two kinds. First, if the political administration of the community is unfriendly toward the idea of new legal services programs, the work of the program can be substantially nullified if the unit is headed by a political appointee. Second, quality staffing in any agency may be hard to achieve if the criteria for choice are political. This problem can be a particular hazard to legal services programs that operate through existing agencies, since it is often difficult to break old, established political patterns. On the other hand, the public endorsement of top political leaders in the community can greatly enhance the legal unit's chance of gaining community acceptance.

Judges and Juries

A recent study surveyed 3,576 trials in two reporting samples. Over 500 judges cooperated in the study. The survey was conducted using judges as reporters for jury trials. Two major questions were explored in the survey, "First, what is the magnitude and direction of the disagreement between judge and jury? And, second, what are the sources and explanations of such disagreement?"

The study found that judges and juries agree (would decide the same case the same way) in 75.4 percent of the cases. If cases in which the jury hung are eliminated, the overall agreement rate rises to 78 percent. Thus at the outset, whatever the defects of the jury system, it can be seen that the jury at least arrives at the same result as the judge in over three-fourths of the cases.

The direction of disagreement is clearly toward a more lenient jury than judge. The trend was not isolated to any particular type of offense but was spread throughout crime categories. Additionally, the pattern found was that in convictions, juries tended to be more lenient as far as counts, degrees, and sentencing.

For civil cases the percentage of agreement and disagreement was about the same except that there did not appear to be any strong sentiment in favor of plaintiff over defendant (or vice versa) by the jury.

In cases decided differently because the judge had facts the jury did not, generally, these facts related to suppressed evidence, personal knowledge of the defendant's prior record, etc. The factors that made the difference between judge and jury in these cases, then, were all facts that we as a society purposefully keep from juries because the information is irrelevant or because it is highly prejudicial. From the study it can be assumed that the judge, hearing the information, did not disregard it but, quite the contrary, used it in reaching his (harsher) judgment.

The overwhelming number of cases in which judge and jury agree argue for the jury's understanding of the evidence because it is not to be expected that a jury deciding cases it does not understand and a judge deciding cases he does understand (we presume) would not agree in their results so often. Also, judges themselves generally did not identify "jury misunderstood the facts" as the reason for disagreement.

The level of sympathy that the jury had with the defendant did make some difference. Although generally the jury was neutral, in about 36 percent of the cases the jury had some reaction (positive or negative) because of the personal characteristics, occupation, family, or court appearance. These factors affected juries differently depending on the age, race, or sex of the defendant. Through various statistical evaluations the study is able to state that "the sympathetic defendant causes disagreement in ... 4 percent of all cases." Similar figures apply for the unsympathetic defendant.

A Jury's Prejudgement

The right to an unbiased jury is an inseparable part of the right to trial by jury as guaranteed by the Seventh Amendment of the United States Constitution. This right guarantees that twelve impartial jurors will hear and "truly try" the cause before them.

In September 1982, the California Supreme Court upheld a lower court's $ 9.2 million verdict against Ford Motor Company despite the fact that three jurors had been working crossword puzzles and one juror had been reading a novel during the presentation of testimony. Four of the twelve jurors hearing the case were admittedly participating in the activities charged and were clearly guilty of misconduct, yet the California Supreme Court found no resultant prejudice against Ford's position.

In the United States, citizens are called upon by the government to serve as jurors. Only under extraordinary circumstances may a citizen be excused from such service. Juries are therefore not necessarily composed of willing volunteers, but instead, are sometimes made up of individuals who are serving against their will, and justice is adversely affected when citizens are "forced" to serve on juries. In "Reflections of a Juror," the author, who served as a juror himself, recognized two distinct perspectives shared among jurors. Some jurors have a very positive attitude about their being asked to serve on a jury. Their perspective is that of rendering a public service by fulfilling their jury duties. On the other hand, some jurors view their obligation as just that, a burdensome obligation, and nothing more. Their attitude is one of getting through with the ordeal as soon as possible, a let's-get-out-of-here-by-this-afternoon approach.

A study conducted with mock juries, concerned specifically with the issue of juror prejudgment, revealed that 25 percent of the jurors polled reached their decision early in the trial. The jurors in the study who admitted to having made up their minds before having heard all the evidence also stated that they generally held to their first impression assessments. By prejudging the outcome

of the case the jurors had, in effect, breached their sworn duty.

From a reading of the California Supreme Court's opinion, it appears that the Court itself had committed the one form of conduct universally prohibited, that of prejudgment. Ford's battle was lost before it had even begun to present its case. In the first place, Ford is a multibillion-dollar international corporation with "pockets" deeper than most. Secondly, Ford had experienced a great deal of negative publicity resulting from recent jury verdicts awarding large sums of money to victims of Pinto automobile accidents wherein it was determined that Ford had defectively designed the Pinto's gasoline tank so that it was prone to explode upon rear end impacts. Finally, the plaintiff was a nineteen-year-old college freshman whose pursuit of a medical career was abruptly ended when he suffered extensive brain damage after the brakes on his 1966 Lincoln failed, causing him to crash into a fountain after careening down a steeply curving hillside street. Ford presented a considerable amount of evidence in an attempt to prove that the cause of the accident was driver error and faulty maintenance and not defective design. The Supreme Court responded to Ford's arguments by stating that the jury was responsible for judging the credibility of witnesses and it would be wholly improper for the Court to usurp that function by reweighing the evidence. How ironic that the Court should so gallantly refuse to upset the decision of the jury, a jury wherein four members admittedly were engaging in extraneous activities when they were supposed to be "judging the credibility of witnesses." It would appear from the misconduct of the jury and the conclusionary statements of the California Supreme Court that Ford's liability was indeed a predetermined, prejudged fact.

If the decision has any impact upon our present system of justice, it will regretfully be a negative one. The California Supreme Court had, in effect, approved a standard of jury conduct so unconscionable as to, in the words of dissenting Justice Richardson, "countenance such a complete erosion of a constitutional command," namely, the right to a fair and impartial jury trial.

A Defendant's Self-Representation

The Sixth Amendment's right to the "assistance of counsel" has been the subject of considerable litigation in twentieth-century American courts. The emphasis has traditionally centered on the degree to which a criminal defendant can demand the assistance of counsel in various courts and at different hierarchical stages of the criminal proceeding. Although past courts have alluded to the idea that a defendant has a converse right to proceed without counsel, the issue had not been squarely addressed by the United States Supreme Court until late in its 1974-75 term. At that time, the Court held that within the Sixth Amendment rests an implied right of self-representation.

As early as 1964, Justice Hugo Black wrote that "the Sixth Amendment withholds from federal courts, in all criminal proceedings, the power and authority to deprive an accused of his life or liberty unless he has or waives the assistance of counsel". However, recognizing that the Sixth

Amendment does not require representation by counsel, it is quite another thing to say that the defendant has a constitutional right to reject professional assistance and proceed on his own. Notwithstanding such a logical and legal fallacy, the Court has, by way of opinion, spoken of a Sixth Amendment "correlative right" to dispense with a lawyer's help. Many lower federal courts have seized upon this and supported their holdings on it, in whole or in part.

The basic motivation behind this proffered right of self-representation is that "respect for individual autonomy requires that (the defendant) be allowed to go to jail under his own banner if he so desires" and that he should not be forced to accept counsel in whom he has no confidence. Courts have ruled that neither due process nor progressive standards of criminal justice require that the defendant be represented at trial by counsel. The Supreme Court, in its 1975 decision, held that a defendant in a state criminal trial has a constitutional right to waive counsel and carry on his own case in propria persona. In raising this obscure privilege to a constitutional level, the Court stated that, so long as the defendant is made aware of the dangers and disadvantages of self-representation, his lack of technical legal knowledge will not deprive him of the right to defend himself personally.

The Court conceded that the long line of right to counsel cases have alluded to the idea that the assistance of counsel is a prerequisite to the realization of a fair trial. However, the Court noted that the presence of counsel is of minor significance when a stubborn, self-reliant defendant prohibits the lawyer from employing his knowledge and skills. This line of reasoning is concluded with the observation that "the defendant and not his lawyer or the state, will bear the personal consequences of a conviction." The logical extension of this premise brings the Court to its decision that, recognizing the traditional American respect for the individual, the defendant "must be free personally to decide whether in his particular case counsel is to his advantage".

Property Rights and Freedom of Speech

The Constitution of the United States protects both property rights and freedom of speech. At times these rights conflict. Resolution then requires a determination as to the type of property involved. If the property is private and not open to the general public, the owner may absolutely deny the exercise of the right of free speech thereon. On the other hand, if public land is at issue, the First Amendment protections of expression are applicable. However, the exercise of free speech thereon is not absolute. Rather it is necessary to determine the appropriateness of the forum. This requires that consideration be given to a number of factors including: character and normal use of the property, the extent to which it is open to the public, and the number and types of persons who frequent it. If the forum is clearly public or clearly private, the resolution of the greater of rights is relatively straightforward.

In the area of quasi-public property, balancing these rights has produced a dilemma. This is the situation when a private owner permits the general public to use his property. When persons seek to use the land for passing out handbills or picketing, how is a conflict between property rights

and freedom of expression resolved?

The precept that a private property owner surrenders his rights in proportion to the extent to which he opens up his property to the public is not new. In 1965, Lord Chief Justice Hale wrote that when private property is "affected with a public interest, it ceases to be private". Throughout the development of Anglo-American law, the individual has never possessed absolute dominion over property. Land becomes clothed with a public interest when the owner devotes his property to a use in which the public has an interest. In support of this position the chairman of the board of the Wilde Lake Shopping Center in Columbia, Maryland said: The only real purpose and justification of any of these centers is to serve the people in the area – not the merchants, not the architects, not the developers. The success or failure of a regional shopping center will be measured by what it does for the people it seeks to serve.

These doctrines should be applied when accommodation must be made between a shopping center owner's private property rights and the public's right to free expression. It is hoped that when the Court is asked to balance these conflicting rights it will keep in mind what Justice Black said in 1945: "When we balance the Constitutional rights of owners of property against those of the people to enjoy (First Amendment) freedom(s) ... we remain mindful of the fact that the latter occupy a preferred position."

"Felony-Murder" Rule

Under very early common law, all felonies were punishable by death. The perpetrators of the felony were hanged whether or not a homicide had been committed during the felony. Later, however, most felonies were declared to be noncapital offenses. The common law courts, in need of a deterrent to the use of deadly force in the course of these noncapital felonies, developed the "felony-murder" rule. The first formal statement of the rule stated: "Any killing by one in the commission of a felony is guilty of murder." The killing was a murder whether intentional or unintentional, accidental or mistaken. The usual requirement of malice was eliminated and the only criminal intent necessary was the intent to commit the particular underlying felony. All participants in the felony were guilty of murder – actual killer and nonkiller confederates.

Proponents of the rule argued that it was justified because the felon demonstrated a lack of concern for human life by the commission of a violent and dangerous felony and that the crime was murder either because of a conclusive presumption of malice or simply by force of statutory definition.

Opponents of the rule describe it as a highly artificial concept and "an enigma wrapped in a riddle". They are quick to point out that the rule has been abandoned in England where it originated, abolished in India, severely restricted in Canada and a number of other commonwealth countries, is unknown in continental Europe, and abandoned in Michigan. In reality, the real strength of the opponents' criticism stems from the bizarre and oft times unfair

results achieved when the felony-murder rule is applied mechanically. Defendants have been convicted under the rule where the killing was purely accidental, or the killing took place after the felony during the later flight from the scene; or a third party killed another (police officer killed a citizen or vice versa; or a victim died of a heart attack 15-20 minutes after the robbery was over; or the person killed was an accomplice in the felony).

Attacks on the rule have come from all directions with basically the same demand – reevaluate and abandon the archaic legal fiction; restrict and limit vicarious criminal liability; prosecute killers for murder, not nonkillers; increase punishment for the underlying felony as a real deterrent; and initiate legislative modifications. With the unstable history of the felony-murder rule, including its abandonment by many jurisdictions in this country, the felony-murder rule is dying a slow but certain death.

Supreme Court of the US

In many ways, the Supreme Court is the worst place to win a human rights case – even when an Earl Warren is sitting as Chief Justice. It takes a large amount of money and a long time to get a case to the Court. Even when a party wins, he may not come out with a clear victory. The decisions are seldom unanimous, and a five-to-four or six-to-three split tends to weaken the impact of a majority opinion. A Supreme Court decision may have a tremendous effect in the long run, but it seldom brings about immediate major changes.

Most cases do not get to the Supreme Court anyway. This is especially true of human rights disputes, where the parties usually cannot afford to appeal, and their lawyers will never get paid even if they win because a monetary award seldom goes with a victory on principle. Most disputes never even become lawsuits. People don't tend to go to a lawyer when they think they have been treated unfairly. They may not know a lawyer they trust; they may not have the money to pay a fee; and they don't think it will help to go to court anyway. This means that for most people the highest court, the supreme court of the land, is the policeman on the beat, the highway patrolman, the parent, the priest, the landlord, the boss, the creditor, or the voter registrar. A decision by the Supreme Court guaranteeing human rights has no meaning until these people around the country know about and decide to follow it.

Of course, all the courts and government agencies in the country are required to follow Supreme Court decisions, too. But "the Court's authority – possessed of neither the purse nor the sword – ultimately rests on sustained public confidence in its moral sanction", as Justice Frankfurter put it so succinctly. And compliance with Warren Court opinions was certainly not automatic.

Studying the development of human rights law through the landmark decisions of the Warren Court can lead to increased respect for our legal system. At the same time it can lead to the opposite conclusion: that the best time to win a human rights case is at the beginning, the best place is where the case starts, the best judge and jury are the participants, and the best method is

without a lawsuit. In other words, the best protectors of human rights are not the courts but rather citizens who know and insist on their own rights and who act to guarantee the rights of others to freedom, justice, and equality.

Citizens concerned about human rights who were raised during the Warren Court era came to depend on the Court to right the wrongs created by acts of Congress, executive orders, and lower court decisions, and by the actions of government officials, private citizens, and groups. The Court did not always fulfill this function, but it did so more often than any previous Supreme Court – and perhaps more often than any Court of the near future. To the extent it followed and advanced the development of human rights law, it was the Camelot of courts rather than on their own collective action. To the extent it disarmed the people by suggesting reliance on the courts rather than on their own collective action, it led to disillusionment when Earl Warren stepped down. It is necessary to reassess the opportunities for progress through the judicial system.

The Exclusionary Rule

The exclusionary rule has been continually attacked in recent years as inadequate for its purpose and as a "technicality" that allows criminals to go free since the rule permits exclusion of evidence from a defendant's trial where the evidence was obtained in violation of Fourth Amendment rights against unreasonable searches and seizures. In a decision of 1961, the Supreme Court held that the exclusionary rule was, in fact, constitutionally required by the Fourth Amendment and not a judicially created rule of evidence as preciously stated in the Wolf decision. This determination of constitutional origin made the exclusionary principle applicable to the states through the due process clause of the Fourth Amendment. The Court relied on the increasing number of states accepting the rule as a matter of law concluding that alternative methods of protecting the Fourth Amendment's right to be free from unreasonable searches and seizures had been futile. The Court made clear that the purpose of the rule was to deter police abuse of the constitutional right to be protected from unreasonable searches and seizures by removing any incentive to disregard the guarantee.

A 1974 decision reflects a shift in the Supreme Court's attitude. The precise issue facing the Court was whether a witness before a grand jury may refuse to answer questions on the ground that they are based on evidence obtained in an illegal search and seizure. The Court held that the exclusionary rule cannot be invoked by a grand jury witness who is not subject to criminal prosecution. It further concluded that the exclusionary rule was a "judicially created remedy" rather than a personal constitutional right of the party aggrieved. This conclusion clearly contradicts the 1961 decision, which indicated that the rule was more than just a judicial remedy – it was a constitutional right applicable to the states.

The immediate ramification is to alter the nature and basis of the rule. It is no longer to be characterized as a personal right required by the Constitution as a guarantee of protection by the Fourth Amendment. If this conclusion is applicable to future court decisions, it would appear to

necessitate an overruling of the decision of 1961 because the decision of 1974 is contrary to the very heart of that holding. The conspicuous failure of the Court to confront its former decision evidences a determined effort to reach a different conclusion. This new view evidences the dissatisfaction with the exclusionary rule by the Court and its move toward modification or complete abandonment of the rule.

In two habeas corpus cases in 1976, whereas the states must still apply the exclusionary rule, the responsibility of determining the constitutionality of the search will fall on the states, rather than the federal courts. Defendants will not be able to challenge the trial court's ruling on the validity of searches in a subsequent federal habeas corpus proceeding once it has been judged at the state level. It would be an ultimate constitutional disaster to remove the exclusionary rule without some mechanism of police deterrence. Certainly, no one wants to make the Fourth Amendment a nullity.

Pornography

The United States Supreme Court, in 1977, recognized that establishments selling and exhibiting obscene materials are injurious to the public morals and that the state has the power to regulate such establishments in order to protect the public. Armed with this decision, local prosecutors hoped to take advantage of the relative ease with which a civil action can be used to abate a public nuisance. For example, in civil proceedings, the plaintiff prosecutor only needs to prove his allegation that the material in question is obscene, and therefore a public nuisance, by a preponderance of the evidence, rather than beyond a reasonable doubt as is required in criminal proceedings. Furthermore, obtaining an injunction, even though a temporary one, will halt the display of the questioned material at least until the trial takes place. Also, whenever an equitable remedy, such as an injunction, is sought, a jury is not required as a matter of right. This is significant because only one person, the judge, must be convinced that the material is obscene, and the job is made easier if the judge is one who adheres to a broad definition of obscenity.

These substantive and procedural advantages account for the increase in civil nuisance actions to abate the distribution of pornography by closing down establishments that sell sexually explicit material. However such attempts are limited by the First Amendment prohibition against prior restraints. Inherent in that amendment's provision for freedom of the press is the aim to avoid "previous restraints of publication" by eliminating any requirement of printing approval by state authorities. In keeping with this principle, state and federal courts have held that adult bookstores and theaters may be abated as a public nuisance only after all the material sold or exhibited has been determined to be obscene.

In Florida, the state supreme court ruled that a business could be prohibited from selling or exhibiting material if it consists of specifically named books, magazines, or movies previously judicially determined to be obscene, but the business could not be closed unless and until all the material sold or shown there was judged to be obscene. It reasoned that closing bookstores or

theaters, even temporarily, before all the material is determined to be obscene is in effect to forbid the sale or exhibition of constitutionally protected books, magazines, or films, as well as potentially obscene matter. This, the court called an "impermissible prior restraint in violation of the First and Fourteenth Amendments".

Although adult bookstores and theaters cannot be closed by using public nuisance actions, zoning ordinances may be used to regulate their location. The restrictions could permit such establishments anywhere within the city limits provided certain conditions are met. Such an ordinance was enacted by the city of Detroit and it was upheld by the United States Supreme Court. The ordinance prohibited adult bookstores, and adult motion picture theaters, and adult minitheaters within five hundred feet from a residential dwelling or rooming unit.

Obscene Language

On October 30, 1973, a Tuesday afternoon around two o'clock, radio station WBAI, NY, NY, owned and operated by the Pacifica Foundation, was conducting a general discussion of the contemporary society's attitude toward language. The WBAI host played a segment of the album "George Carlin, Occupation: Foole", a twelve-minute comedy routine entitled "Filthy Words" in which Carlin related his thoughts about "the words you couldn't say on the public ... airwaves." He proceeded to list and repeat numerous times a number of colloquial expressions for sexual and excretory activities and organs. In response, the Federal Communications Commission (FCC) issued a regulation restricting the broadcast of "indecent" language to certain hours of the day. Though a Court of Appeals reversed the ruling, the Supreme Court later upheld the FCC.

It can hardly be denied the proliferation of so-called dirty books and films has, to date, reached almost a saturation point. However, the Pacifica case deals specifically with the mere use of certain "taboo" words. The real point of Mr. Carlin's routine was to illustrate the absurdity of many people's attitude in regard to the use of these particular words. Indeed, it is quite conceivable that many open-minded parents would not object to their children being exposed to Carlin's monologue in the hope that their children might acquire more objective and realistic attitude toward these supposedly "filthy" words.

The concept of channeling such language to a time of day when children are less likely to be in the listening audience would very likely be interpreted by children as reinforcing the notion that these words are in fact dangerous, which can somehow warp the supple minds of our youth. This attitude appears to be much less rational than that of George Carlin, who was attempting to put in a more realistic perspective the use of, and reaction to, this kind of language.

One must not lose sight of the fact that this case represents a suppression of the freedom of speech. The Supreme Court does not acknowledge the irrefutable fact that children are bound to be exposed to "dirty words" in a myriad of ways other than through the public airwaves. The language used by Carlin in his monologue is far from uncommon in the playgrounds and in many

instances, the homes of American's children. Ironically, the FCC has repeatedly refused to impose sanctions on the depiction of violence on the public airways, but has been continually vigilant in attempting to guard against the use of "indecent" or "obscene" language. This puzzling attitude seems to convey the most troublesome message that it is all right for our children to be exposed to and influenced by a seemingly never-ending barrage of graphic and gratuitous violence, but heaven forbid if they should hear a few so-called "dirty words".

Liability of Nuclear Companies

In 1957, Congress passed the Price-Anderson Act, which provides a current limitation of $ 655 million on the liability of nuclear power companies in the event of a "nuclear incident". The dual purpose of the Act is to "protect the public and encourage the development of the atomic energy industry." While the objective of encouraging the development of atomic energy has been achieved, it is not yet known if Price-Anderson would fully compensate the public in the event of a serious nuclear accident.

In the event that a major accident does occur in this country, would the victims be adequately compensated for their injuries? The nuclear industry is promoted under Price-Anderson by having a limit on potential liability even if the accident was the result of gross negligence or willful misconduct. Victims are protected by having an asset pool of at least $ 665 million in which to recover for damages. This amount will undoubtedly be raised when Price-Anderson is renewed. Victims are also protected if an accident is deemed to be an "extraordinary nuclear occurrence" by the requirement that certain defenses be waived by the utility company. However, the victims would still substantially bear the risk because of the uncertainty of recovery for radiation injuries. This is contrary to the tort (wrongful act) concept that "he who breaks must pay".

The Price-Anderson Act does not disturb the common law rule of causation. A person injured in a nuclear incident has the burden of proving a causal relationship between the incident and his alleged injury. While the plaintiff does not have to show that the conduct of the defendant was the sole cause of the injury, the plaintiff must prove that it is more likely than not that the conduct of the defendant was a substantial factor in bringing about the injury. The plaintiff has the burden of showing that there is a high probability (i.e., 51 percent or more) that the defendant's conduct caused his alleged injury. A mere possibility of such causation is not enough; and when the matter remains one of pure speculation or conjecture, or the probabilities are at best evenly balanced, it becomes the duty of the court to direct a verdict for the defendant. In the event of a nuclear incident involving a large release of radioactive material, such as Chernobyl, it would probably not be difficult for immediate victims to demonstrate a causal link between the accident and their injuries. Scientists are able to detect approximately how much radiation was released into the atmosphere, and how surrounding areas are affected by it.

An argument in favor of Price-Anderson is that it ensures that claimants have an asset pool of at

least $ 665 million in which to recover for damages. Without Price-Anderson, the possibility is very real that the utility company would be unable to pay claims arising out of a major accident. If the claims were sufficiently large or numerous, a private company could well choose bankruptcy over paying the claims. For example, the Planex Corporation, a defendant in thousands of asbestos cases, filed for reorganization under Chapter 11 of the Bankruptcy Code in 1982.

Electoral Districts

The Constitution gives the Congress power to make the laws that determine the election of senators and representatives. At first Congress exercised its power to supervise apportionment by simply specifying in the statutes how many representatives each state was to have. From 1842 until the 1920s, it went further and required that the districts be relatively compact (not scattered areas) and relatively equal in voting population.

Major shifts in population occurred in the twentieth century: large numbers of farmers could no longer maintain small farms and moved to the cities to find employment; rapidly growing industries, organized in factory systems, attracted rural workers; and many blacks who could no longer find work in southern agriculture moved to the North to get better jobs and get away from strict Jim Crow living conditions. The rural areas of the country became more sparsely populated while the city populations swelled.

As these changes were occurring, Congress took less interest in its reapportionment power, and after 1929 did not reenact the requirements. In 1946, voters in Illinois asked the Supreme Court to remedy the serious malapportionment of their state congressional districts. Justice Frankfurter, writing for the Court, said the federal courts should stay out of "this political thicket." Reapportionment was a "political question" outside the jurisdiction of these courts. Following this holding, malapportionment grew more severe and widespread in the United States.

In the Warren Court era, voters again asked the Court to pass on issues concerning the size and shape of electoral districts, partly out of desperation because no other branch of government offered relief, and partly out of hope that the Court would reexamine old decisions in this area as it had in others, looking at basic constitutional principles in the light of modern living conditions. Once again the Court had to work through the problem of separation of powers, which had stood in the way of court action concerning representation. In this area, too, the Court's rulings were greeted by some as shockingly radical departures from "the American way," while others saw them as a reversion to the democratic processes established by the Constitution, applied to an urbanized setting.

Strikes by Government Workers

Although statutory law (a law enacted by the legislature) expressly forbids strikes by government workers, the constitutional validity of these laws as well as their interpretative applications have been under attack in various cases, the most publicized case being that of the federal government air traffic controllers.

The First Amendment to the United States Constitution guarantees the right of free speech. The constitutional issue to be resolved therefore is whether strikes are a form of "symbolic speech" or "symbolic conduct" that should be accorded the same degree of First Amendment protection as verbal communications. In a case that involved private rather than public employees, a Texas Court held that picketing as an incident to a labor dispute is a proper exercise of freedom of speech. The court went on to say that only a "clear and present danger of substantive evil will justify an abridgment of the right to picket." Later, the New Jersey state court concluded that even though picketing is protected by freedom of speech, this does not mean that statutes prohibiting strikes are constitutionally invalid. This case involved a constitutional interpretation of the New Jersey statute. The court stated that the justification of this statute is based on the ground of "clear and present danger" that would result to the state if the performance of functions of a public utility was ceased or impaired by a strike. Those in favor of no-strike clauses seem to concede that strikes are form of symbolic speech that should be accorded the same degree of First Amendment protection as verbal speech. Their justification for upholding these clauses is the "clear and present danger" doctrine. They tend to believe that strikes by government employees automatically present a "clear and present danger of substantive evil." However, according to the U.S. Supreme Court, legislatures cannot be relied upon to make a determination of what constitutes a "clear and present danger." In effect this is what happened when President Reagan ordered the firing of the air traffic controllers, based on the antistrike clause pronounced by Congress. The Supreme Court held that courts themselves must determine what constitutes a clear and present danger. The Supreme Court went on to say that mere public inconvenience or annoyance is not enough to constitute a clear and present danger. Thus, the public inconvenience and annoyance created by the curtailment of air traffic as a result of the controllers' strike may not be sufficient to constitute such a danger. The argument that a clear and present danger resulted from the emergency staffing of control towers by military and supervisory personnel is invalidated by the fact that the airlines have run safely since the strike.

This is not to suggest that every employee should automatically have the right to strike. However, constitutional consideration of due process and freedom of speech should bar denying government workers, as a class, the right to strike. A close look should be taken at what actually constitutes a "clear and present danger of substantive evil." It is an evasion for courts to allow legislatures to prejudge all government services to be different for "strike" purpose than those provided by the private sector. The court itself should look at such factors as the nature of the service in determining whether particular no-strike clauses are constitutionally valid. The nature of the provider of the service (i.e., government v. private) is not a compelling justification for upholding no-strike clauses.

第六部分　　商业、社会学、经济学、人类学、心理学

Group Morality

It has become apparent that the morality of individuals is far more consistent and far less conditional than the morality of groups. The individual may, through sensitivity or reasoning, judge a situation objectively, even when that situation impinges on self-interest.

The social group, binding together the natural human impulses of individuals, tends to diminish rational constraints, particularly in pursuit of its goals. Empathy with the needs of others, existent in the individual, disappears in the egoism of the group. The restraint of impulse is served by the cumulative ruthlessness of self-centered drives. Spontaneity becomes irresponsibility; confidence becomes arrogance: such is the potency and moral poverty of social groups.

The tension created by this dichotomy is inevitable. The rational individual attempts to resist the incursions of his self-consciousness, but is simultaneously drawn, by common cause or purpose, into the larger community. He must subjugate internal moral constraints to the group need for unquestioning support. Eventually he may identify so completely that he arrogates to himself the responsibility to purge others of their individualism.

Communication of Ideas

In the study of language, it has been recognized that words used to convey sensory perceptions, feelings, and emotions carry no meaning of themselves. They can trigger feelings or sensations that the listener has experienced – not more than that. We know that the perception of color varies with light, background, and distance. What is green seen by a colorblind person? Which is the "real" color? Are we not, in asking that question, implying that color exists independent of the observer?

Similarly, when we characterize an individual or a social behavior as "good" or "bad," we are communicating the contention that this evaluation is absolute, objective and unchanging. Yet it should be apparent that varying observers would present disparate evaluations. We may, then, attempt to win agreement by describing the behavior in question, offering criteria on which judgment was based, indicating that these criteria are personal. This communication style, the semanticist holds, will help bridge the gap between individuals and make it more likely that people will understand each other.

Students of language have experimented with the use of nonsymbolic language as a means of overcoming linguistic barriers. The language of sounds, as in the cases of infants and animals,

and the language of facial expression and body pose, have been termed "phatic communion" by Bronislaw Malinowski. We all know people who have good "poker faces." We also know some whose faces communicate – sometimes contradicting their spoken sentiments. Korzybski has pointed out that signal reactions, instantaneous and unmediated, if undifferentiated according to the appropriateness of the situation, reflect immature, impulsive personalities, while the development of the ability to delay response will permit modified, thoughtful symbol behavior, a characteristic of the mature person.

Sense of Guilt

Clinicians at a recent psychoanalytic conference brought forth interesting evidence that guilt, far from being the psychic impediment generally conceived, has the potential to inspire creativity, and enhance sensitivity.

Tests of prison inmates have shown significantly low scores on guilt scales, measured by psychologist-researcher Donald L. Mosher. The Mosher scales measure the tendency to feel guilt in three forms: sex guilt, hostility guilt, and general guilt, called morality conscience. Prisoners who had committed sex crimes scored low on sex guilt; those who were imprisoned for violent crimes scored low on hostility guilt; those incarcerated for crimes against property scored low on morality conscience.

Other studies conducted in the armed forces corroborate the findings that men accused of brutality toward those they command feel little or no sense of remorse or guilt, but tend to defend vigorously the "correctness" of their actions.

That guilt can be a lonely and lacerating burden has long been known. The ancient Greeks understood the redemptive feelings and cathartic benefits of watching the tragic hero struggle with guilt. Hamlet plots to "catch the conscience of the King." O'Neill re-creates the ancient themes and adds to them contemporary guilts. The Judeo-Christian ethic transmits this heavy burden, commencing with "original sin" and continuing with the need for confession and atonement.

Although in the past many psychoanalysts, joined by a recent spate of authors seem to have been dedicated to eliminating the sense of guilt, some clinicians hold that guilt is the necessary price of socialization.

Still others agree with Dr. Karl Menninger in the value of appropriate, or rational guilt, and feel that a prime objective of therapeutic intervention should be to help the patient differentiate between guilt feelings that are unwarranted and unfounded, based perhaps on distorted perceptions of past occurrences, and those which are well-founded responses to real situations. The child, it is felt, should not be made to feel guilt about exploring his body, just as the adult should not be ashamed of his or her sexuality. But this freedom must not be viewed as license.

When the individual's desires or needs can be fulfilled without coming into conflict with societal needs, the albatross of guilt can be shed.

It is this new approach, this compromise, which we find surfacing in twentieth-century literature. Herzog and Willy Loman battle their needless guilt, and their experiences help us all to cope.

Study of Behavior

The distinction often made between learning and instinct is exemplified by two theoretical approaches to the study of behavior: ethnology and behaviorist psychology. Ethnology is usually thought of as the study of instinct. In the ethnological world view most animal behavior is governed by four basic factors: sign stimuli (instinctively recognized cues), motor programs (innate responses to cues), drive (controlling motivational impulses) and imprinting (a restricted and seemingly aberrant form of learning).

Three of these factors are found in the egg-rolling response of geese, a behavior studied by Konrad Z. Lorenz and Nikolass Tinbergen, who together with Karl Frisch were the founders of ethnology. Geese incubate their eggs in mound-shaped nests built on the ground, and it sometimes happens that the incubating goose inadvertently knocks an egg out of the nest. Such an event leads to a remarkable behavior. After settling down again on its nest, the goose eventually notices the errant egg. The animal then extends its neck to fix its eyes on the egg, rises and rolls the egg back into the nest gently with its bill. At first glance this might seem to be a thoughtful solution to a problem. As it happens, however, the behavior is highly stereotyped and innate. Any convex object, regardless of color and almost regardless of size, triggers the response; beer bottles are particularly effective.

In this example the convex features that trigger the behavior are the ethnologists' sign stimuli. The egg-rolling response itself is the motor program. The entire behavior is controlled by a drive that appears about two weeks before the geese lay eggs and persists until about two weeks after the eggs hatch. Geese also exhibit imprinting: during a sensitive period soon after hatching, goslings will follow almost any receding object that emits an innately recognized "kum-kum" call and thereafter treat the object as a parent.

Classical behaviorist psychologists see the world quite differently from ethnologists. Behaviorists are primarily interested in the study of learning under strictly controlled conditions and have traditionally treated instinct as irrelevant to learning. Behaviorists believe nearly all the responses of higher animals can be divided into two kinds of learning called classical conditioning and operant conditioning.

Classical conditioning was discovered in dogs by the Russian physiologist Ivan P. Pavlov. In his classic experiment he showed that if a bell is rung consistently just before food is offered to a dog, eventually the dog will learn to salivate at the sound of the bell. The important factors in

classical conditioning are the unconditioned stimulus (the innately recognized cue, equivalent to the ethnological sign stimulus, which in this case is food), the unconditioned response (the innately triggered behavioral act, equivalent to the ethnological motor program, which in this case is salivation) and the conditioned stimulus (the stimulus the animal is conditioned to respond to, which in this case is the bell). Early behaviorists believed any stimulus an animal was capable of sensing could be linked, as a conditioned stimulus, to any unconditioned response. In operant conditioning, the other major category of learning recognized by most behaviorists, animals learn a behavior pattern as the result of trial-and-error experimentation they undertake in order to obtain food. The experimenter shapes the behavior by rewarding the rat at first for even partial performance of the desired response. For example, at the outset the rat might be rewarded simply for facing the end of the cage in which the lever sits. Later the experimenter requires increasingly precise behavior, until the response is perfected. Early behaviorists thought any behavior an animal was capable of performing could be taught, by means of operant conditioning, as a response to any cue or situation.

Research on Depression

Helplessness and passivity are central themes in describing human depression. Laboratory experiments with animals have uncovered a phenomenon designated "learned helplessness." Dogs given inescapable shock initially show intense emotionality, but late become passive in the same situation. When the situation is changed from inescapable to escapable shock, the dogs fail to escape even though escape is possible. Neurochemical changes resulting from learned helplessness produce an avoidance-escape deficit in laboratory animals.

Is the avoidance deficit caused by prior exposure to inescapable shock learned helplessness or is it simply stress-induced noradrenergic deficiency leading to a deficit in motor activation? Avoidance-escape deficit can be produced in rats by stress alone, i.e., by a brief swim in cold water. But a deficit produced by exposure to extremely traumatic events must be produced by a very different mechanism than the deficit produced by exposure to the less traumatic uncontrollable aversive events in the learned helplessness experiments. A nonaversive parallel to the learned helplessness induced by uncontrollable shock, e.g., induced by uncontrollable food delivery, produces similar results. Moreover, studies have shown the importance of prior experience in learned helplessness. Dogs can be "immunized" against learned helplessness by prior experience with controllable shock. Rats also show a "mastery effect" after extended experience with escapable shock. They work far longer trying to escape from inescapable shock than do rats lacking this prior mastery experience. Conversely, weanling rats given inescapable shock fail to escape shocks as adults. These adult rats are also poor to nonaversive discrimination learning.

Certain similarities have been noted between conditions produced in animals by the learned helplessness procedure and by the experimental neurosis paradigm. In the latter, animals are first trained on a discrimination task and are then tested with discriminative stimuli of increasing

similarity. Eventually, as the discrimination becomes very difficult, animals fail to respond and begin displaying abnormal behaviors: first agitation, then lethargy.

It has been suggested that both learned helplessness and experimental neurosis involve inhibition of motivation centers and pathways by limbic forebrain inhibitory centers, especially in the septal area. The main function of this inhibition is compensatory, providing relief from anxiety or distress. In rats subjected to the learned-helplessness and experimental-neurosis paradigms, stimulation of the septum produces behavioral arrest, lack of behavioral initiation and lethargy, while rats with septal lesions do not show learned helplessness.

How analogous the model of learned helplessness and the paradigm of stress-induced neurosis are to human depression is not entirely clear. Inescapable noise or unsolvable problems have been shown to result in conditions in humans similar to those induced in laboratory animals, but an adequate model of human depression must also be able to account for the cognitive complexity of human depression.

Measuring Intelligence

In 1921, leading investigators in the field of intelligence, participating in a symposium, "Intelligence and Its Measurement", sponsored by the *Journal of Educational Psychology*, defined the title concept, producing almost as many definitions as there were definers, but reached no consensus. One contemporary observer was prompted to quip that intelligence seemed merely to be the capacity to do well on an intelligence test. Now, sixty years later, the situation seems little changed. As Yale's Robert J. Sternberg, an influential cognitive psychologist, warns, "If we are to seek genuine understanding of the relationship between natural intelligence and measured intelligence (IQ), there is one route that clearly will not lead us to the heart of the problem and that we must avoid at all costs. This route is defining away (rather than defining) intelligence as whatever it is that IQ tests measure."

The dominant approach followed by researchers attempting to define intelligence has been factor analysis, a statistical method that examines mental ability test scores with an eye to discerning constellations of test scores that are closely related to each other. The underlying thesis is that where a correlation appears among the scores of many people on tests of different mental abilities, a single factor of intelligence must be common to performance on those tests.

Charles Spearman, originator of factor analysis, held that two kinds of factors form the basis of intelligence: a general factor and specific factors. Subsequent theorists divided the general factor into two or more subfactors, the two most generally agreed upon being verbal-educational and practical-mechanical abilities. Factor analysis has listed many discrete mental abilities and produced models that show how they combine, but it has not suggested how these abilities work, nor has it been productive in dealing with adaptational ability or practical problem solving.

A more recent approach is process analysis or information processing, whose thrust is to analyze the processes of test performance rather than the products of test performance. Process analysts, says Dr. Sternberg, do not reject the findings of factor analysis but, rather, seek "to supplement our understanding of the factors of intelligence with an understanding of the processes that are responsible at least in part for the generation of these factors as sources of individual difference".

The counterpart of the factor as a unit of analysis is the component, described by Dr. Sternberg as "an elementary information process that operates upon internal representations of objects or symbols." Componential studies have been subjected to statistical analysis, and the findings have clarified how certain tasks are performed. However, like factor analysis, process analysis has so far provided few insights into practical problem solving and adaptation to real-world environments. Dr. Sternberg hopes that the application of componential analysis to simulations of real-world task performance will contribute to an understanding of how intelligence operates in that area of human activity.

Some in the field say that identifying factors and processes is worthwhile, but that doing so will not lead to a definition of intelligence. These critics warn that the models produced by such research may become the basis for some future statement that intelligence is what the models model.

Human Cognition

In developing a model of cognition, we must recognize that perception of the external world does not always remain independent of motivation. While progress toward maturity is positively correlated with differentiation between motivation and cognition, tension will, even in the mature adult, militate towards a narrowing of the range of perception and in the lessening of the objectivity of perception.

Cognition can be seen as the first step in the sequence of events leading from the external stimulus to the behavior of the individual. The child develops from belief that all things are an extension of its own body to the recognition that objects exist independent of his perception. He begins to demonstrate awareness of people and things which are removed from his sensory apparatus and initiates goal-directed behaviors. He may, however, refuse to recognize the existence of barriers to the attainment of his goals, despite the fact that his cognition of these objects has been previously demonstrated.

In the primitive being, goal-directed behavior can be very simply motivated. The presence of an attractive object will cause an infant to reach for it; its removal will result in the cessation of that action. Studies have shown no evidence of the infant's frustration; rather, it appears that the infant ceases to desire the object when he cannot see it. Further indications are that the infant's attention to the attractive object increases as a result of its not being in his grasp. In fact, if he holds a toy and another is presented, he is likely to drop the first in order to clutch the second.

Often, once he has the one desired in his hands, he loses attention and turns to something else.

In adult life, mere cognition can be similarly motivational, although the visible presence of the opportunity is not required as the instigator of response. The mature adult modifies his reaction by obtaining information, interpreting it, and examining consequences. He formulates a hypothesis and attempts to test it. He searches out implicit relationships, examines all factors, and differentiates among them. Just as the trained artist can separate the values of color, composition, and technique, while taking in and evaluating the whole work, so, too, the mature person brings his cognitive learning strengths to bear in appraising a situation.

Understanding that cognition is separate from action, his reactions are only minimally guided from conditioning, and take into consideration anticipatable events.

The impact of the socialization process, particularly that of parental and social group ideology, may reduce cognitively directed behavior. The tension thus produced, as for instance the stress of fear, anger, or extreme emotion, will often be the overriding influence.

The evolutionary process of development from body schema through cognitive learning is similarly manifested in the process of language acquisition. Auditing and speaking develop first, reading and writing much later on. Not only is this evident in the development of the individual human being from infancy on, but also in the development of language for humankind.

Every normal infant has the physiological equipment necessary to produce sound, but the child must first master their use for sucking, biting, and chewing before he can control his equipment for use in producing the sounds of language. The babble and chatter of the infant are precursors to intelligible vocal communication.

From the earliest times, it is clear that language and human thought have been intimately connected. Sending or receiving messages, from primitive warnings of danger to explaining creative or reflective thinking, this aspect of cognitive development is also firmly linked to the needs and aspirations of society.

Vocabulary Acquisition

The acquisition of vocabulary has been less intensively studied than the internalization of operational grammar, but it is an equally complex task. To learn a new word, a child must associate sound and meaning; surprisingly, the concept may take less time to master than the mechanics of recognizing and producing the word. It is also harder to learn distinctions within semantic categories than between them: a child may know that fuchsia refers to a color and not a smell, but be unsure of what color it is.

Vocabulary study through word lists and dictionaries, as practiced in school, poses new problems,

primarily because of the mechanics of dictionary study as opposed to interaction with responsive adults. The most common error is that of substitution: a child looking up an unfamiliar word such as *meticulous*, and finding a familiar phrase such as *very careful* as part of the definition, will treat the new word as inter-changeable with the familiar phrase, producing sentences such as "I was meticulous about falling of the cliff." Hence, though the normal child masters some 80,000 words in sixteen years – about fourteen per day – little of this learning takes place in school.

Adults and Adolescents

The response of adults to the behavior of adolescents is often more strongly influenced by the adult's own needs than by the way the adolescents are acting. A whole range of emotions and feelings from concern to outright hostility is evoked, leading to perceptions and actions which impact on our entire society.

The adult world clings tenaciously to social order, resistive to the young people whose questioning, risk-taking, and spontaneity threaten existing arrangements. Adult fears that adolescents will escape their control, with the concomitant anxiety about unplanned change and disorderliness, lead to determined efforts to restrain young people through familial and societal regulation.

Equally important is the loss of self-esteem that many adults feel when faced with the adolescent challenge to the tenets by which their lives have been ruled. Convinced that success is the measure of worth, unwilling to admit to doubt about the path taken or the value of the prizes secured, the adult defends equally against the serious probing and the ingenuous disaffection. The youth who searches for and attains what his parents had yearned for and then denied themselves, attacks the most vulnerable facet of the adult personality – the fragile self-esteem. It is no wonder, then, that rather than an attempt at loving understanding, the parent responds with bitterness and antagonism.

The Evil of Majority

A majority taken collectively may be regarded as a being whose opinions and, most frequently, whose interests are posed to those of another being, which is styled a minority. If it is admitted that a man possessing absolute power may misuse that power by wronging his adversaries, why should a majority not be liable to the same reproach? Men are not apt to change their characters by agglomeration; nor does their patience in the presence of obstacles increase with the consciousness of their strength. For these reasons we should refuse to any individual.

One social power must always predominate over others, but liberty is endangered when this power is checked by no obstacles which may retard its course and force it to moderate its own

vehemence. Unlimited power is in itself a bad and dangerous thing, and no power on earth is so worthy of honor for itself or of reverential obedience to the rights which it represents that we should admit its uncontrolled and all-predominant authority. When the right and means of absolute command are conferred on a people or a king, on an aristocracy or a democracy, a monarchy or a republic, there has been implanted the germ of tyranny.

The main evil of the present democratic institutions of the United States does not arise, as is often asserted in Europe, from their weakness, but from their overpowering strength; the excessive liberty which reigns in that country is not so alarming as is the very inadequate security which exists against tyranny.

When an individual or a party is wronged in the United States, to whom can he apply for redress: If to the public opinion, public opinion constitutes the majority; if to the legislature, it represents the majority and implicitly obeys its injunctions; if to the executive power, it is appointed by the majority and remains a passive tool in its hands; the public troops consist of the majority under arms; the jury is the majority invested with the right of hearing judicial cases, and in certain states even the judge are elected by the majority. However iniquitous or absurd the evil complained about, no sure barrier is established to defend against it.

Prediction of Future Violent Behavior

In determining the likelihood of future violent behavior by a mental patient, as well as the frequency and social context of such behavior, it is essential to ascertain carefully the relevant history and pattern – for instance, whether there has been violent behavior in the past, and, if so, whether any previous act is part of a consistent pattern or a rare, possibly onetime, event. If the violent behavior is quite atypical, the predictive task may well be impossible. The best one can do is to try to determine the particular person – and situation-specific factors that appear to have elicited the past violent act. Also, it is essential to ascertain whether the same or very similar circumstances are likely to recur in the person's life situation. For example, in the case of a serious assault on a spouse, where the violent act is part of a long-standing pattern of domestic arguments lubricated by considerable imbibing of alcoholic beverages, it is important to determine whether the previous pattern of heavy drinking by the couple is likely to continue and whether the spouse has obtained a legal separation or has otherwise moved away from the setting to which the individual will return.

In some cases, the likelihood of repeated violent behavior may relate to a clearly discernible sequence of circumstances that can be ascertained from the relevant history. For example, in a case of child battering, it may be determined that an unmarried young woman is usually a very attentive and capable mother to her three small children, all under six years of age. However, when her boyfriends begin to lose interest in her and she is left alone to care for the children in her state of worry and resentment, she begins to drink, and incidents of child battering occur. Such knowledge can be of great value to persons charged with assisting the woman under some

form of community supervision.Therapeutic and various other types of support are urgently needed when an individual's life circumstances indicate a probability of further child abuse. If the requisite support and assistance can be provided in the community, it may not be necessary to prolong confinement.

An individual's past pattern of behavior and functioning, as well as the social setting and circumstances in which he or she will be living, typically provides more relevant and reliable information in predicting future behavior than the person's psychiatric diagnosis. The problem of determining the "dangerousness" of mentally disordered persons is not basically different from that of evaluating criminal recidivism for offenders. For example, if an offender has a long criminal record, a pattern of poor occupational functioning, very limited job skills, and various behavioral and social problems such as alcohol and drug abuse, and if there is also likely to be an absence of family or other social supports in the community, then the probability of further criminal conduct is generally high. And these factors tend to be far more critical and determinative of outcome than the person's psychiatric diagnosis.

It remains to be seen whether a psychiatric diagnosis or a history of serious mental illness by itself is of any use in determining the likelihood of future violent behavior. Perhaps as psychiatric theory grows and develops, such a tool will prove more valuable. At present, however, it appears that mental health professionals may actually decrease their predictive accuracy by focusing exclusively on a patient's mental condition or on vague or speculative psychodynamic factors.

Ibo Authority

A theorist of modernization in underdeveloped countries has defined this process as one of passing from "traditional authority," derived from long-standing custom and the authority of kinship leaders, to "legal-rational authority," based on procedures specifically established for particular goals. No doubt this scheme works well enough in categorizing some societies, but how is one to classify the Ibo society of southeastern Nigeria? In precolonial Ibo society, village decisions were reached in general meetings, and formalized by striking the ground with an *ofo*, a staff possessed by the head of a kinship group. This might seem to fit the theorist's model; but the Ibo altered this procedure whenever appropriate, for instance, if the senior kinship head forgot his ofo, any other ofo could be used. The Ibo, too, freely revised any customary procedures in order to pursue trade – a flexibility that served them well in the new capitalist economy introduced by colonialism. If this theorist is to be consistent, he must concede that the Ibo were "modern" before the first colonist stepped ashore.

Quechua

The Quechua world is submerged, so to speak, in a cosmic magma that weighs heavily upon it. It

possesses the rare quality of being, as it were, interjected into the midst of antagonistic forces, which in turn implies a whole body of social and aesthetic structures whose innermost meaning must be the administration of energy. This gives rise to the social organism known as the ayllu, the agrarian community that regulates the procurement of food. The ayllu formed the basic structure of the whole Inca Empire.

The central ideal of this organization was a kind of closed economy, just the opposite of our economic practices, which can be described as open. The closed economy rested on the fact that the Inca controlled both the production and consumption of food. When one adds to this fact the religious ideas noted in the Quechua texts cited by the chronicler Santa Cruz Pachacuti, one comes to the conclusion that in the Andean zone the margin of life was minimal and was made possible only by the system of magic the Quechua constructed through his religion. Adversities, moreover, were numerous, for the harvest might fail at any time and bring starvation to millions. Hence the whole purpose of the Quechua administrative and ideological system was to carry on the arduous task of achieving abundance and staving off shortages. This kind of structure presupposes a state of unremitting anxiety, which could not be resolved by action. The Quechua could not do so because his primordial response to problems was the use of magic, that is, recourse to the unconscious for the solution of external problems. Thus the struggle against the world was a struggle against the dark depths of the Quechua's own psyche, where the solution was found. By overcoming the unconscious, the outer world was also vanquished.

These considerations permit us to classify Quechua culture as absolutely static or, more accurately, as the expression of a mere state of being. Only in this way can we understand the refuge that it took in the germinative center of the cosmic mandala as revealed by Quechua art. The Quechua empire was nothing more than a mandala, for it was divided into four zones, with Cuzco in the center. Here the Quechua ensconced himself to contemplate the decline of the world as though it were caused by an alien and autonomous force.

Culture of Gulch Communities

Before the recent encroachments of tourism and commercialization, the culture of the Gulch communities on the Sea Islands off the southeast coast of the U.S. retained a unique identity derived partially from the Islands' history as an area reserved for freed slaves after the Civil War. As an almost exclusively Black community, the Gulch preserved African traditions concerning family structure and religious practices. At the same time, as a community of ex-slaves, they held onto several facets of the Southern life they had left behind. This mixture provided a heritage which, at least until recently, was strong enough to sustain a vital culture.

As Patricia Jones Jackson has pointed out, the basic unit of social life on the Sea Islands, as in West Africa, is the extended family. Since many islands are sectioned off into family communities, kinship ties are important to one's acceptance into the social structure. Membership in the extended family also affects property rights. In the traditional Gullah system, family

members do not normally buy land from one another, but acquire it by an unwritten contract known as "heir's land." Rules pertaining to marriage seem to be at least as broad in scope. Common-law marriages are considered as legitimate as marriages recorded by contract under law. Indeed, the infrequent occurrence of divorce and separation within the Sea Island communities demonstrates the strong cohesion of Gullah marital and familial institutions.

Unlike the laws and customs relating to family structure, the religious practices of the Sea Islanders, on the surface at least, bespeak a U.S. heritage. Depending on the village, a Baptist or Methodist church acts as an essential social institution. Yet, in contrast to the dualistic body/soul approach to the individual found in Christian teaching, the Gullah believe that a person has an earthly body, a soul which returns upon death to the Divine Kingdom, and a separate spiritual entity which can remain on earth and influence the lives of those still living. This belief in a "body spirit" is prevalent among West African peoples, according to Jones Jackson. She also notes the African influences on the interaction between the minister and the congregation: the prayers and sermons "embody a classical Ciceronian, rhetorical style and employ sophistic ornaments capable of divinely inspiring and passionately persuading a congregation to respond with raucous and joyous replies."

Myth

Plato – who may have understood better what forms the mind of man than do some of our contemporaries who want their children exposed only to "real" people and everyday events – knew what intellectual experiences make for true humanity. He suggested that the future citizens of his ideal republic begin their literary education with the telling of myths, rather than with mere facts or so-called rational teachings. Even Aristotle, master of pure reason, said: "The friend of wisdom is also a friend of myth".

Modern thinkers who have studied myths and fairy tales from a philosophical or psychological viewpoint arrive at the same conclusion, regardless of their original persuasion. Mircea Eliade, for one, describes these stories as "models for human behavior [that], by that very fact, give meaning and value to life". Drawing on anthropological parallels, he and others suggest that myths and fairy tales were derived from, or give symbolic expression to, initiation rites or rites of passage – such as metaphoric death of an old, inadequate self in order to be reborn on a higher plane of existence. He feels that this is why these tales meet a strongly felt need and are carriers of such deep meaning.

Other investigators with a depth-psychological orientation emphasize the similarities between the fantastic events in myths and fairy tales and those in adult dreams and daydreams – the fulfillment of wishes, the winning out over all competitors, the destruction of enemies – and conclude that one attraction of this literature is its expression of that which is normally prevented from coming to awareness.

There are, of course, very significant differences between fairy tales and dreams. For example, in dreams more often than not the wish fulfillment is disguised, while in fairy tales much of it is openly expressed. To a considerable degree, dreams are the result of inner pressures which have found no relief, of problems which beset a person to which he knows no solution and to which the dream finds none. The fairy tale does the opposite: it projects the relief of all pressures and not only offers ways to solve problems but promises that a "happy" solution will be found.

We cannot control what goes on in our dreams. Although our inner censorship influences what we may dream, such control occurs on an unconscious level. The fairy tale, on the other hand, is very much the result of common conscious and unconscious content having been shaped by the conscious mind, not of one particular person, but the consensus of many in regard to what they view as universal human problems, and what they accept as desirable solutions. If all these elements were not present in a fairy tale, it would not be retold by generation after generation. Only if a fairy tale met the conscious and unconscious requirements of many people was it repeatedly retold, and listened to with great interest. No dream of a person could arouse such persistent interest unless it was worked into a myth, as was the story of the pharaoh's dream as interpreted by Joseph in the Bible.

Models in Economics

The relevance of formal economic models to real-world policy has been a topic of some dispute. The economists R.D. Norton and S.Y. Rhee achieved some success in applying such a model retrospectively to the Korean economy over a fourteen-year period; the model's figures for output, prices, and other variables closely matched real statistics. The model's value in policy terms, however, proved less clear-cut. Norton and Rhee performed simulations in which, keeping long-term factors constant, they tried to pinpoint the effect of short-term policy changes. Their model indicated that rising prices for imported oil would increase inflation; reducing exports by five percent would lower Gross Domestic Product and increase inflation; and slowing the growth of the money supply would result in slightly higher inflation.

These findings are somewhat startling. Many economists have argued that reducing exports will lessen, not increase, inflation. And while most view escalating oil costs as inflationary, few would think the same of slower monetary growth. The Norton-Rhee model can perhaps be viewed as indicating the pitfalls of a formalist approach that stresses statistical "goodness of fit" at the expense of genuine policy relevance.

Expansion Phase of Business Cycle

One phase of the business cycle is the *expansion phase*. This phase is a twofold one, including recovery and prosperity. During the recovery period there is ever-growing expansion of existing

facilities, and new facilities for production are created. More businesses are created and older ones expanded. Improvements of various kinds are made. There is an ever-increasing optimism about the future of economic growth. Much capital is invested in machinery or "heavy" industry. More labor is employed. More raw materials are required. As one part of the economy develops, other parts are affected. For example, a great expansion in automobiles results in an expansion of the steel, glass, and rubber industries. Roads are required; thus the cement and machinery industries are stimulated. Demand for labor and materials results in greater prosperity for workers and suppliers of raw materials, including farmers. This increases purchasing power and the volume of goods bought and sold. Thus prosperity is diffused among the various segments of the population. This prosperity period may continue to rise and rise without an apparent end. However, a time comes when this phase reaches a peak and stops spiraling upwards. This is the end of the expansion phase.

Business and Human Rights Issues

Multinational corporations frequently encounter impediments in their attempts to explain to politicians, human rights groups, and (perhaps most importantly) their consumer base why they do business with, even seek closer business ties to, countries whose human rights records are considered heinous by United States standards. The CEOs propound that in the business trenches, the issue of human rights must effectively be detached from the wider spectrum of free trade. Discussion of the uneasy alliance between trade and human rights has trickled down from the boardrooms of large multinational corporations to the consumer on the street who, given the wide variety of products available to him, is eager to show support for human rights by boycotting the products of a company he feels does not do enough to help its overseas workers. International human rights organizations also are pressuring the multinationals to push for more humane working conditions in other countries and to in effect develop a code of business conduct that must be adhered to if the American company is to continue working with the overseas partner.

The president, in drawing up a plan for what he calls the "economic architecture of our times", wants economists, business leaders, and human rights groups to work together to develop a set of principles that the foreign partners of United States corporations will voluntarily embrace. Humans rights activists, incensed at the nebulous plans for implementing such rules, charge that their agenda is being given low priority by the State Department. The president vociferously denies their charges, arguing that each situation is approached on its merits without prejudice, and hopes that all the groups can work together to develop principles based on empirical research rather than political fiat, emphasizing that the businesses with experience in the field must initiate the process of developing such guidelines. Business leaders, while paying lip service to the concept of these principles, fight stealthily against their formal endorsement as they fear such "voluntary" concepts may someday be given the force of law. Few business leaders have forgotten the Sullivan principles, in which a set of voluntary rules regarding business conduct with South African (giving benefits to workers and banning apartheid in the companies that

worked with U.S. partners) became legislation.

Unemployment

Changes in the volume of unemployment are governed by three fundamental forces: the growth of the labor force, the increase in output per man-hour, and the growth of total demand for goods and services. Changes in the average hours of work enter in exactly parallel fashion but have been quantitatively less significant. As productivity rises, less labor is required per dollar of national product, or more goods and services can be produced with the same number of man-hours. If output does not grow, employment will certainly fall; if production increases more rapidly than productivity (less any decline in average hours worked), employment must rise. But the labor force grows too. Unless gross national product (total final expenditure for goods and services corrected for price changes) rises more rapidly than the sum of productivity increase and labor-force growth (again modified for any change in hours of work), the increase in employment will be inadequate to absorb the growth in the labor force. Inevitably the unemployment rate will increase. Only when total production expands faster than the rate of labor force growth plus the rate of productivity increase and minus the rate at which average annual hours fall does the unemployment rate fall. Increases in productivity were more important than growth of the labor force as sources of the wide gains in output experienced in the period from the end of the war to the mid-sixties. These increases in potential production simply were not matched by increases in demand adequate to maintain steady full employment.

Except for the recession years of 1949, 1954, and 1958, the rate of economic growth exceeded the rate of productivity increase. However, in the late 1950s productivity and labor force were increasing more rapidly than usual, while the growth of output was slower than usual. This accounted for the change in employment rates.

But if part of the national purpose is to reduce and contain unemployment, arithmetic is not enough. We must know which of the basic factors we can control and which we wish to control. Unemployment would have risen more slowly or fallen more rapidly if productivity had increased more slowly, or the labor force had increased more slowly, or the hours of work had fallen more steeply, or total output had grown more rapidly. These are not independent factors however, and a change in any of them might have caused changes in the others.

A society can choose to reduce the growth of productivity, and it can probably find ways to frustrate its own creativity. However, while a reduction in the growth of productivity at the expense of potential output might result in higher employment in the short run, the long-run effect on the national interest would be disastrous.

We must also give consideration to the fact that hidden beneath national averages is continuous movement into, out of, between, and within labor markets. For example, 15 years ago, the average number of persons in the labor force was 74 million, with about 70 million employed

and 3.9 million unemployed. Yet 14 million experienced some term of unemployment in that year. Some were new entrants to the labor force, others were laid off temporarily. The remainder were those who were permanently or indefinitely severed from their jobs. Thus, the average number of unemployed during a year understates the actual volume of involuntary displacement that actually occurs.

High unemployment is not an inevitable result of the pace of technological change, but the consequence of passive public policy. We can anticipate a moderate increase in the labor force accompanied by a slow and irregular decline in hours of work. It follows that the output of the economy – and the aggregate demand to buy it – must grow in excess of 4 percent a year just to prevent the unemployment rate from rising, and even greater if the unemployment rate is to fall further. Yet our economy has seldom, if ever, grown at a rate faster than 3.5 percent for any extended length of time.

We have no cause for complacency. Positive fiscal, monetary, and manpower policies will be needed in the future.

Different Views on Unemployment

The majority of this school endorsed the position of the Council that tax reduction would eventually reduce the unemployment level to 4% of the labor force with no other assistance. At 4%, bottlenecks in skilled labor, middle-level manpower and professional personnel were expected to retard growth and generate wageprice pressures. To go beyond 4%, the interim goal of the Council, it was recognized that improved education, training and retraining and other structural measures would be required. Some expansionists insisted that the demand for goods and services was nearly satiated and that it was impossible for the private sector to absorb a significant increase in output. In their estimate, only the lower-income fifth of the population and the public sector offered sufficient outlets for the productive efforts of the potential labor force. The fact that the needs of the poor and the many unmet demands for public services held higher priority than the demands of the marketplace in the value structure of this group no doubt influenced their economic judgments.

Those who found the major cause of unemployment in structural features were primarily labor economists, concerned professionally with efficient functioning of labor markets through programs to develop skills and place individual workers. They maintained that increased aggregate demand was a necessary but not sufficient condition for reaching either the CEA's 4% target or their own preferred 3%. This pessimism was based, in part, on the conclusion that unemployment among the young, the unskilled, minority groups and depressed geographical areas is not easily attacked by increasing general demand. Further, their estimate of the numbers of potential members of the labor force who had withdrawn or not entered because of lack of employment opportunity was substantially higher than that of the CEA. They also projected that increased demand would put added pressure on skills already in short supply rather than employ

the unemployed, and that because of technological change, which was replacing manpower, much higher levels of demand would be necessary to create the same number of jobs.

The structural school, too, had its hyperenthusiasts: fiscal conservatives who, as an alternative to expansionary policies, argued the not very plausible position that a job was available for every person, provided only that he or she had the requisite skills or would relocate. Such extremist positions aside, there was actually considerable agreement between two main groups, though this was not recognized at the time. Both realized the advisability of tax cut to increase demand, and both realized that reduction of structural rigidities would be needed to reduce unemployment below a point around 4%. In either case, the policy implications differed in emphasis and not in content.

Theories of the Firm

Any discussion of theories of the firm must start with the neoclassical approach, the staple diet of modern economists. Developed over the last one hundred years or so, this approach can be found in any modern-day textbook on microeconomics; in most textbooks it is the only theory of the firm presented.

Neoclassical theory views the firm as a set of feasible production plans. A manager presides over this production set, buying and selling inputs and outputs in a spot market and choosing the plan that maximizes owners' welfare. Welfare is usually represented by profit, or by the firm's market value.

To many economists, this is a caricature of the modern firm; it is rigorous but rudimentary. At least three reasons help explain its prolonged survival. First, the theory lends itself to an elegant and general mathematical normalization. Second, it is useful for analyzing how a firm's production choices respond to exogenous change in the environment, such as an increase in wages or sales tax. Finally, the theory is also useful for analyzing the consequences of strategic interaction between firms under conditions of imperfect competition; for example, it can help us understand the relationship between the degree of concentration in an industry and that industry's output and price level.

Granted these strengths, neoclassical theory has some clear weaknesses. It does not explain how production is organized within a firm, how conflicts of interest between the firm's various constituencies – its owners, managers, workers and consumers – are resolved, or more generally, how the manager achieves the goal of profit-maximization. More subtly, neoclassical theory begs the question of what defines a given firm or what determines its boundaries. Since the theory does not address the issue of each firm's size or extent, it cannot explain, for example, the consequences of two firms choosing to merge. Neoclassical theory describes in rudimentary terms how firms function, but contributes little to any meaningful picture of their structure.

Principal-agent theory, an important recent development, addresses some of the weaknesses of the neoclassical approach. Principal-agent theory now recognizes conflicts of interest between different economic actors. The theory still views the firm as a production set, but now a professional manager makes production choices – such as investment or effort allocations – that the firm's owners do not observe. Also, because the manager deals with the day-to-day operations of the firm, she is presumed to have information about the firm's profitability that the owners lack. In addition, the manager has other goals in mind beyond the owners' welfare, such as on-the-job perks, an easy life, empire building and so on.

Under these conditions, principal-agent theory argues that it will be impossible for the owners to implement their own profit-maximizing plans directly, through a contract with the manager; in general, the owners will not even be able to tell exposit facto whether the manager has chosen the right plan. Instead, the owners will try to align the manager's objectives with their own by putting the manager on an incentive scheme such as profit-sharing. Even under an optimal incentive scheme, however, the manager will put some weight on her own objectives at the expense of those of the owners, and conflicting interests remain. Hence, we have the beginnings of a managerial theory of the firm.

Privatization in Developing Countries

In both developed and developing nations, governments finance, produce, and distribute various goods and services. In recent years, the range of goods provided by the government has extended broadly, encompassing many goods which do not meet the economic purist's definition of "public goods". As the size of the public sector has increased steadily, there has been a growing concern about the effectiveness of the public sector's performance as producer.

Critics argue that the public provision of certain goods is inefficient and have proposed that the private sector should replace many current public sector activities, that is, these services should be privatized. During the Reagan administration, greater privatization efforts have been pursued in the United States. Concurrent with this trend has been a strong endorsement by international bilateral donor agencies for heavier reliance on the private sector in developing countries. The underlying claim is that the private sector can improve the quality of outputs and deliver goods more quickly and less expensively than the public sector in these countries.

This claim, however, has mixed theoretical support and little empirical verification in the Third World. The political, institutional, and economic environments of developing nations are markedly different from those developed countries. It is not clear that the theories and empirical evidence that purport to justify privatization in developed countries are applicable to developing countries. Often policy makers in developing nations do not have sufficient information to design effective policy shifts to increase efficiency of providing goods through private initiatives. Additionally, there is a lack of basic understanding about what policy variables need to be altered to attain desired outcomes of privatization in developing countries. A recent study of

privatization in Honduras examined the policy shift from "direct administration" to "contracting out" for three construction activities: urban upgrading for housing projects, rural primary schools, and rural roads. It tested key hypotheses pertaining to the effectiveness of privatization, focusing on three aspects: cost, time, and quality.

The main finding was that contracting out in Honduras did not lead to the common expectations of its proponents because institutional barriers and limited competitiveness in the marketplace have prevented private contractors from improving quality and reducing the time and cost required for construction.

Privatization in developing countries cannot produce goods and services efficiently without substantial reform in the market and regulatory procedures. Policy makers interested in privatization as a policy measure should consider carefully the multiple objectives at the national level.

Warfare

War has escaped the battlefield and now can, with modern guidance systems on missiles, touch virtually every square yard of the earth's surface. It no longer involves only the military profession, but engulfs also entire civilian populations. Nuclear weapons have made major war unthinkable. We are forced, however, to think about the unthinkable because a thermonuclear war could come by accident or miscalculation. We must accept the paradox of maintaining a capacity to fight such a war so that we will never have to do so.

War has also lost most of its utility in achieving the traditional goals of conflict. Control of territory carries with it the obligation to provide subject peoples certain administrative, health, education, and other social service; such obligations far outweigh the benefits of control. If the ruled population is ethnically or racially different from the rulers, tensions and chronic unrest often exist which further reduce the benefits and increase the costs of domination. Large populations no longer necessarily enhance state power and, in the absence of high levels of economic development, can impose severe burdens on food supply, jobs, and the broad range of services expected of modern governments. The noneconomic security reasons for the control of territory have been progressively undermined by the advances of modern technology. The benefits of forcing another nation to surrender its wealth are vastly outweighed by the benefits of persuading that nation to produce and exchange goods and services. In brief, imperialism no longer pays.

Making war has been one of the most persistent of human activities in the 80 centuries since men and women settled in cities and became thereby "civilized", but the modernization of the past 80 years has fundamentally changed the role and function of war. In pre-modernized societies, successful warfare brought significant material rewards, the most obvious of which were the stored wealth of the defeated. Equally important was human labor – control over people as slaves

or levies for the victor's army – and the productive capacity of agricultural lands and mines. Successful warfare also produced psychic benefits. The removal or destruction of a threat brought a sense of security, and power gained over others created pride and national self-esteem.

Warfare was also the most complex, broad-scale and demanding activity of pre-modernized people. The challenges of leading men into battle, organizing, moving and supporting armies, attracted the talents of the most vigorous, enterprising, intelligent and imaginative men in the society. "Warrior" and "statesman" were usually synonymous, and the military was one of the few professions in which an able, ambitious boy of humble origin could rise to the top. In the broader cultural context, war was accepted in the pre-modernized society as a part of the human condition, a mechanism of change, and an unavoidable, even noble, aspect of life. The excitement and drama of war made it a vital part of literature and legends.

Flaws in Unemployment Compensation System

Our current system of unemployment compensation has increased nearly all sources of adult unemployment: season and cyclical variations in the demand for labor, weak labor force attachment and unnecessarily long duration of unemployment. First, for those who are already unemployed, the system greatly reduces the cost of extending the period of unemployment. Second, for all types of unsteady work – seasonal, cyclical and casual – it raises the net wage to the employee, relative to the cost of the employer.

As for the first, consider a worker who earns $ 500 per month or $ 6000 per year if she experiences no unemployment. If she is unemployed for one month, she loses $ 500 in gross earnings but only $ 116 in net income. How does this occur? A reduction of $ 500 in annual earnings reduces her federal, payroll and state tax liability by $ 134. Unemployment compensation consists of 50% of her wage or $ 250. Her net income therefore falls from $ 366 if she is employed, to $ 250 paid as unemployment compensation. Moreover, part of the higher income from employment is offset by the cost of transportation to work and other expenses associated with employment; and in some industries, the cost of unemployment is reduced further or even made negative by the supplementary unemployment benefits paid by employers under collective bargaining agreements. The overall effect is to increase the duration of a typical spell of unemployment and to increase the frequency with which individuals lose jobs and become unemployed.

The more general effect of unemployment compensation is to increase the seasonal and cyclical fluctuations in the demand for labor and the relative number of short-lived casual jobs. A worker who accepts such work knows she will be laid off when the season ends. If there were no unemployment compensation, workers could be induced to accept such unstable jobs only if the wage rate were sufficiently higher in those jobs than in the more stable alternative. The higher cost of labor, then, would induce employers to reduce the instability of employment by smoothing production through increased variation in inventories and delivery lags, by additional

development of off-season work and by the introduction of new production techniques, e.g., new methods of outdoor work in bad weather.

Employers contribute to the state unemployment compensation fund on the basis of the unemployment experience of their own previous employees. Within limits, the more benefits that those former employees draw, the higher is the employer's tax rate. The theory of experience rating is clear. If an employer paid the full cost of the unemployment benefits that his former employees received, unemployment compensation would provide no incentive to an excess use of unstable employment. In practice, however, experience rating is limited by a maximum rate of employer contribution. For any firm that pays the maximum rate, there is no cost for additional unemployment and no gain from a small reduction in unemployment.

The challenge at this time is to restructure the unemployment system in a way that strengthens its good features while reducing the harmful disincentive effects. Some gains can be achieved by removing the ceiling on the employer's rate of contribution and by lowering the minimum rate to zero. Employers would then pay the full price of unemployment insurance benefits and this would encourage employers to stabilize employment and production. Further improvement could be achieved if unemployment insurance benefits were taxed in the same way as other earnings. This would eliminate the anomalous situations in which a worker's net income is actually reduced when he returns to work.

Unemployment Rate

The full-employment unemployment rate cannot be determined with any great precision. One thing is certain: it cannot be zero or even close to zero. A zero unemployment rate would mean that no one ever entered or re-entered the labor force, that no one ever quit a job or was laid off, and that for new entrants or reentrants in the process of searching for a job consumed no time. Nor can full employment be defined as an equality between the number of unemployed persons and the number of unfilled jobs. By this definition, almost any unemployment rate could be consistent with "full employment".

The customary definition of the full-employment unemployment rate is the lowest rate of unemployment that can be attained without resulting in an accelerated rate of inflation, given the existing economic conditions. However, no one can be sure exactly what unemployment rate is implied by this definition, since it is not possible to predict exactly how much of a change in the rate of inflation will be associated with any given change in the unemployment rate.

In the early 1960s, President Kennedy's Council of Economic Advisors (CEA) determined that 4 percent was the best estimate of the full-employment unemployment rate. That rate was based on experience during the period from mid-1955 to mid-1957, when the unemployment rate fluctuated around an average of 4.1 percent and the consumer price index advanced at an average rate of 2.5 percent per year. However, although a 4-percent unemployment rate may have been

consistent with an acceptably low rate of inflation in the mid-1950s, by the late 1960s this proposition had become increasingly doubtful. Our experience since then has been such that those who accept the customary definition of the full-employment unemployment rate now consider 5 percent, or even 5.5 percent, as the best we can do under the existing circumstances.

The principal reason for this upward adjustment is the changed composition of the labor force. If we take the age – and sex-specific unemployment rates that existed in 1956 (when the overall unemployment rate was 4.1 percent) and weight them by the age – and sex-specific shares of the labor force that prevail currently, the overall unemployment rate become 5 percent. That is to say, the full-employment unemployment rate equivalent to 4 percent two decades ago has increased simply because the labor force now is composed of relatively more workers – primarily teenagers and young adults – with relatively higher turnover rates.

Other developments also may have increased the full-employment unemployment rates of all age-sex groups. The most important of these have probably been the extension of unemployment insurance to previously uncovered groups of workers and the lengthening of the period during which unemployed workers can collect benefits. To the extent that these changes have increased quit and layoff rates or the average length of time unemployed persons spend looking for work, the full-employment unemployment rate has risen.

An Unfair Imbalance

Some economists who believe that the United States could learn much from Japan's economic success argue that there is an unfair imbalance in the exchange of ideas between Japan and the United States. It is true that Japan imports in translation considerable scholarship and that the number of Japanese publications on economics put into other languages, particularly English, is very small. The imbalance may seem even more unjust when one considers that the monthly journal *Keiza Hyoron* recently included a bibliography listing over 800 periodicals on economics that are written in Japanese.

Japanese scholars, however, tend to publish mostly for the domestic audience. The publish-or-perish philosophy so dominant in the United States is virtually nonexistent in Japan; so once a Japanese scholar attains permanent tenure status while an assistant professor, there is no strong incentive to compete in the international forum for recognition. And given the rigors of the refereeing process, it is far easier, by comparison, to publish at home, thereby enhancing a domestic reputation that may ultimately be more useful for advancement than an international one.

Furthermore, in the social sciences, it is much easier to publish in international journals if the writing deals with abstract theory; and in economics, a number of distinguished and internationally recognized mathematical economists and econometricians have emerged in Japan. A social scientist engaged in research on Japan, however, tends to encounter far greater difficulty

in having findings published in an international journal. A highly focused piece may not be of sufficient interest to foreign scholars; and unlike articles in the natural sciences or even mathematical economics, it must be put into exceptionally good English. A few Japanese scholars possess such remarkable linguistic skills; but for the rest, the cost of a professional translation may be prohibitive.

Also, as many as two-thirds of the journals listed by *Keiza Hyoron* are academic in-house organs, created solely for the purpose of enhancing the department's status within the university, and are published only once or twice a year. Contributors are almost exclusively graduate students or younger faculty who need publications for appointment or tenure, and many articles are just lecture notes in disguise or commentaries on the works of foreign scholars. These are consigned to the most remote areas of the library, where they justly gather dust. Unfortunately, the occasional scholarly gem lumped in with the unworthies is destined to be neglected by the profession.

Finally, fully two-thirds to three-quarters of university economists in Japan are Marxians who write purely theoretical works that have nothing to do with the Japanese economy, and they tend to add to the unreadability of their works by writing in Marxian jargon. So while there is much that economists in the United States might find useful in journal published in Japanese, it would be wrong to conclude that the Japanese academic world is intentionally running a huge cultural trade deficit.

Cost of Unemployment

Unemployment is an important index of economic slack and lost output, but it is much more than that. For the unemployed person, it is often a damaging affront to human dignity and sometimes a catastrophic blow to family life. Nor is this cost distributed in proportion to ability to bear it. It falls most heavily on the young, the semiskilled and unskilled, the black person, the older worker, and the underemployed person in a low income rural area who is denied the option of securing more rewarding urban employment ...

The concentrated incidence of unemployment among specific groups in the population means far greater costs to society than can be measured simply in hours of involuntary idleness or dollars of income lost. The extra costs include disruption of the careers of young people, increased juvenile delinquency, and perpetuation of conditions which breed racial discrimination in employment and otherwise deny equality of opportunity.

There is another and more subtle cost. The social and economic strains of prolonged underutilization create strong pressures for cost-increasing solutions. On the side of labor, prolonged high unemployment leads to "share-the-work" pressures for shorter hours, intensifies incentives for restrictive and inefficient measures to protect existing jobs. On the side of business, the weakness of markets leads to attempts to raise prices to cover high average overhead costs

and to pressures for protection against foreign and domestic competition. On the side of agriculture, higher prices are necessary to achieve income objectives when urban and industrial demand for foods and fibers is depressed and lack of opportunities for jobs and higher incomes in industry keep people on the farm. In all these cases, the problems are real and the claims understandable. But the solutions suggested raise costs and promote inefficiency. By no means the least of the advantages of full utilization will be a diminution of these pressures. They will be weaker, and they can be more firmly resisted in good conscience, when markets are generally strong and job opportunities are plentiful.

The demand for labor is derived from the demand for the goods and services which labor participates in producing. Thus, unemployment will be reduced to 4 percent of the labor force only when the demand for the myriad of goods and services – automobiles, clothing, food, haircuts, electric generators, highways, and so on – is sufficiently great in total to require the productive efforts of 96 percent of the civilian labor force.

Although many goods are initially produced as materials or components to meet demands related to the further production of other goods, all goods (and services) are ultimately destined to satisfy demands that can, for convenience, be classified into four categories: consumer demand, business demand for new plants and machinery and for additions to inventories, net export demand of foreign buyers, and demand of government units, Federal, state, and local. Thus gross national product (GNP), our total output, is the sum of four major components of expenditure; personal consumption expenditures, gross private domestic investment, net exports, and government purchases of goods and services.

The primary line of attack on the problem of unemployment must be through measures which will expand one or more of these components of demand. Once a satisfactory level of employment has been achieved in a growing economy, economic stability requires the maintenance of a continuing balance between growing productive capacity and growing demand. Action to expand demand is called for not only when demand actually declines and recession appears but even when the rate of growth of demand falls short of the rate of growth of capacity.

American Economy

The United States economy made progress in reducing unemployment and moderating inflation. On the international side, this year was much calmer than last. Nevertheless, continuing imbalances in the pattern of world trade contributed to intermittent strains in the foreign exchange markets. These strains intensified to crisis proportions, precipitating a further devaluation of the dollar.

The domestic economy expanded in a remarkably vigorous and steady fashion ... The resurgence in consumer confidence was reflected in the higher proportion of incomes spent for goods and services and the marked increase in consumer willingness to take on installment debt. A parallel

strengthening in business psychology was manifested in a stepped-up rate of plant and equipment spending and a gradual pickup in outlays for inventory. Confidence in the economy was also reflected in the strength of the stock market and in the stability of the bond market – For the year as a whole, consumer and business sentiment benefited from rising public expectations that a resolution of the conflict in Vietnam was in prospect and that East-West tensions were easing.

The underpinnings of the business expansion were to be found in part in the stimulative monetary and fiscal policies that had been pursued. Moreover, the restoration of sounder liquidity positions and tighter management control of production efficiency had also helped lay the groundwork for a strong expansion. In addition, the economic policy moves made by the President had served to renew optimism on the business outlook while boosting hopes that inflation would be brought under more effective control. Finally, of course, the economy was able to grow as vigorously as it did because sufficient leeway existed in terms of idle men and machines.

The United States balance of payments deficit declined sharply. Nevertheless, by any other test, the deficit remained very large, and there was actually a substantial deterioration in our trade account to a sizable deficit, almost two thirds of which was with Japan ... While the overall trade performance proved disappointing, there are still good reasons for expecting the delayed impact of devaluation to produce in time a significant strengthening in our trade picture. Given the size of the Japanese component of our trade deficit, however, the outcome will depend importantly on the extent of the corrective measure undertaken by Japan. Also important will be our own efforts in the United States to fashion internal policies consistent with an improvement in our external balance.

The underlying task of public policy for the year ahead – and indeed for the longer run – remained a familiar one: to strike the right balance between encouraging healthy economic growth and avoiding inflationary pressures. With the economy showing sustained and vigorous growth, and with the currency crisis highlighting the need to improve our competitive posture internationally, the emphasis seemed to be shifting to the problem of inflation. The Phase Three program of wage and price restraint can contribute to dampening inflation. Unless productivity growth is unexpectedly large, however, the expansion of real output must eventually begin to slow down to the economy's larger run growth potential if generalized demand pressures on prices are to be avoided. Indeed, while the unemployment rates of a bit over five percent were still too high, it seems doubtful whether the much lower rates of four percent and below often cited as appropriate definitions of full employment do in fact represent feasible goals for the United States economy – unless there are improvements in the structure of labor and product markets and public policies influencing their operation. There is little doubt that overall unemployment rates can be brought down to four percent or less, for a time at least, by sufficient stimulation of aggregate demand. However, the resultant inflationary pressures have in the past proved exceedingly difficult to contain.

Trade Protectionism

"The United States seems totally indifferent to our problems," charges French Foreign Minister Claude Cheysson, defending his Government's decision to defy President Reagan and proceed with construction of the Soviet gas pipeline. West German Chancellor Helmut Schmidt endorsed the French action and sounded a similar note. Washington's handling of the pipeline, he said, has "cast a shadow over relations" between Europe and the United States, "damaging confidence as regards future agreements."

But it's not just the pipeline that has made a mockery of Versailles. Charges of unfair trade practices and threats of retaliation in a half-dozen industries are flying back and forth over the Atlantic – and the Pacific, too – in a worrisome crescendo. Businessmen, dismayed by the long siege of sluggish economic growth that has left some 30 million people in the West unemployed, are doing what comes naturally: pressuring politicians to restrain imports, subsidize exports, or both. Steelmakers in Bonn and Pittsburgh want help; so do auto makers in London and Detroit, textile, apparel and shoe manufacturers throughout the West and farmers virtually everywhere.

Democratic governments, the targets of such pressure, are worried about their own political fortunes and embarrassed by their failure to generate strong growth and lower unemployment. The temptation is strong to take the path of least resistance and tighten up on trade – even for a Government as devoted to the free market as Ronald Reagan's. In the past 18 months, Washington, beset by domestic producers, has raised new barriers against imports in autos, textiles and sugar. Steel is likely to be next. Nor is the United State alone. European countries, to varying degrees, have also sought to defend domestic markets or to promote exports through generous subsidies ...

The upcoming meeting, to consider trade policy for the 1980's, is surely well timed. "It has been suggested often that world trade policy is 'at a crossroads' – but such a characterization of the early 1980's may be reasonably accurate," says C. Fred Bergsten, a former Treasury official in the Carter Administration, now director of a new Washington think tank, the Institute for International Economics.

The most urgent question before the leaders of the industrial world is whether they can change the fractious atmosphere of this summer before stronger protective measures are actually put in place. So far, Mr. Bergsten says, words have outweighed deeds. The trade picture is dismal. World trade reached some $ 2 trillion a year in 1980 and hasn't budged since. In the first half of his year, Mr. Bergsten suspects that trade probably fell as the world economy stayed flat. But, according to his studies, increased protectionism is not the culprit for the slowdown in trade – at least not yet. The culprit is slow growth and recession, and the resulting slump in demand for imports ...

But there are fresh problems today that could be severely damaging. Though tariffs and outright quotas are low after three rounds of intense international trade negotiations in the past two

decades – new trade restraints, often bound up in voluntary agreements between countries to limit particular imports, have sprouted in recent years like mushrooms in a wet wood. Though the new protectionism is more subtle than the old-fashioned variety, it is no less damaging to economic efficiency and, ultimately, to prospects for world economic growth.

A striking feature is that the new protectionism has focused on the same limited sectors in most of the major industrial countries – textiles, steel, electronics, footwear, shipbuilding and autos. Similarly, it has concentrated on supply from Japan and the newly industrialized countries.

When several countries try to protect the same industries, the dealings become difficult. Take steel. Since 1977, the European Economic Community has been following a plan to eliminate excess steel capacity, using bilateral import quotas along the way to soften the blow to the steelworkers. The United States, responding to similar pressure at home and to the same problem of a world oversupplied with steel, introduced a "voluntary" quota system in 1969, and, after a brief period of no restraint, developed a complex trigger price mechanism in 1978.

Development in Low-income Countries

The economic condition of the low-income regions of the world is one of the great problems of our time. Their progress is important to the high-income countries, not only for humanitarian and political reasons but also because rapid economic growth in the low-income countries could make a substantial contribution to the expansion and prosperity of the world economy as a whole.

The governments of most high-income countries have in recent years undertaken important aid programs, both bilaterally and multilaterally, and have thus demonstrated their interest in the development of low-income countries. They have also worked within the General Agreement on Tariffs and Trade (GATT) for greater freedom of trade and, recognizing the special problems of low-income countries, have made special trading arrangements to meet their needs. But a faster expansion of trade with high-income countries is necessary if the low-income countries are to enjoy a satisfactory rate of growth.

This statement is therefore concerned with the policies of high-income countries toward their trade with low-income countries. Our recommendations are based on the conviction that a better distribution of world resources and a more rational utilization of labor are in the general interest. A liberal policy on the part of high-income countries with respect to their trade with low-income countries will not only be helpful to the low-income countries but, when transitional adjustments have taken place, beneficial to the high-income countries as well.

It is necessary to recognize however, that in furthering the development of low-income countries, the high-income countries can play only a supporting role. If development is to be successful, the main effort must necessarily be made by the people of the low-income countries. The

high-income countries are, moreover, likely to provide aid and facilitate trade more readily and extensively where the low-income countries are seen to be making sound and determined efforts to help themselves, and thus to be making effective use of their aid and trade opportunities.

It is, then, necessary that the low-income countries take full account of the lessons that have been learned from the experience of recent years, if they wish to achieve successful development and benefit from support from high-income countries. Among the most important of these lessons are the following:

Severe damage has been done by inflation. A sound financial framework evokes higher domestic savings and investment as well as more aid and investment from abroad. Budgetary and monetary discipline and a more efficient financial and fiscal system help greatly to mobilized funds for investment and thereby decisively influence the rate of growth. Foreign aid should also be efficiently applied to this end.

The energies of the people of low-income countries are more likely to be harnessed to the task of economic development where the policies of their governments aim to offer economic opportunity for all and to reduce excessive social inequalities.

Development plans have tended to concentrate on industrial investment. The growth of industry depends, however, on concomitant development in agriculture. A steady rise in productivity on the farms, where in almost all low-income countries a majority of the labor force works, is an essential condition of rapid overall growth. Satisfactory development of agriculture is also necessary to provide an adequate market for an expanding industrial sector and to feed the growing urban population without burdening the balance of payments with heavy food imports. Diminishing surpluses in the high-income countries underline the need for a faster growth of agricultural productivity in low-income countries. Success in this should, moreover, lead to greater trade in agricultural products among the low-income countries themselves as well as to increased exports of some agricultural products to the high-income countries.

There can be no doubt about the urgency of the world food problem. Adequate nourishment and a balanced diet are not only necessary for working adults but are crucial for the mental and physical development of growing children. Yet, in a number of low-income countries where the diet is already insufficient the production of food has fallen behind the increase in population. A continuation of this trend must lead to endemic famine. the situation demands strenuous efforts in the low-income countries to improve the production, preservation, and distribution of food so that these countries are better able to feed themselves.

Business Competition

In the competitive model – the economy of many sellers each with a small share of the total market – the restraint on the private exercise of economic power was provided by other firms on

the same side of the market. It was the eagerness of competitors to sell, not the complaints of buyers, that saved the latter from spoliation. It was assumed, no doubt accurately, that the nineteenth-century textile manufacturer who overcharged for his product would promptly lose his market to another manufacturer who did not. If all manufacturers found themselves in a position where they could exploit a strong demand, and mark up their prices accordingly, there would soon be an inflow of new competitors. The resulting increase in supply would bring prices and profits back to normal.

As with the seller who was tempted to use his economic power against the customer, so with the buyer who was tempted to use it against his labor or suppliers. The man who paid less than the prevailing wage would lose his labor force to those who paid the worker his full (marginal) contribution to the earnings of the firm. In all cases the incentive to socially desirable behavior was provided by the competitor. It was to the same side of the market – the restraint of sellers by other sellers and of buyers by other buyers, in other words to competition – that economists came to look for the self-regulatory mechanisms of the economy.

They also came to look to competition exclusively and in formal theory still do. The notion that there might be another regulatory mechanism in the economy had been almost completely excluded from economic thought. Thus, with the widespread disappearance of competition in its classical form and its replacement by the small group of firms if not in overt, at least in conventional or tacit, collusion, it was easy to suppose that since competition had disappeared, all effective restraint on private power had disappeared. Indeed, this conclusion was all but inevitable if no search was made for other restraints, and so complete was the preoccupation with competition that none was made.

In fact, new restraints on private power did appear to replace competition. They were nurtured by the same process of concentration which impaired or destroyed competition. But they appeared not on the same side of the market but on the opposite side, not with competitors but with customers or suppliers. It will be convenient to have a name for this counterpart of competition and I shall call it countervailing power.

To begin with a broad and somewhat too dogmatically stated proposition, private economic power is held in check by the countervailing power of those who are subject to it. The first begets the second. The long trend toward concentration of industrial enterprise in the hands of a relatively few firms has brought into existence not only strong sellers, as economists have supposed, but also strong buyers, a fact they have failed to see. The two develop together, not in precise step, but in such manner that there can be no doubt that the one is in response to the other.

Tax Treaties between Developed and Developing Nations

In the negotiation of tax treaties, developing nations, as a group, share two objectives somewhat

at odds with those of developed nation treaty partners. One such goal, attracting foreign investment, is in the broader context of foreign policy objectives. In the narrower realm of tax policy a common developing country objective is to maximize the public capture of revenues from foreign investment activities.

Unfortunately for potential Third World treaty partners, this latter goal can conflict directly with the desires of both First World governments and individual investors. The preference of First World authorities for restricted source-based taxation is due to considerations of administrative feasibility. Such restrictions, though formally reciprocal, only produce equitable revenue effects when investment flows between treaty partners are relatively equal. However, when investment flows primarily in one direction, as it generally does from industrial to developing countries, the seemingly reciprocal source-based restrictions produce revenue sacrifices primarily by the state receiving most of the foreign investment and producing most of the income – namely, the developing country partner. The benefit is captured either by the taxpayer in the form of reduced excess credits, or by the treasury of the residence (First World) state as the taxpayer's domestically creditable foreign tax liabilities decrease. The potential public revenue gain to the residence state further bolsters the industrial nations' preference for restrictions on source-based taxation – at the direct expense of the treaty partner's revenue goals.

The facilitation of foreign investment by tax treaties, whereas potentially serving the tax-policy goal of maximizing public revenue, also (or even instead) may serve broader economic objectives of developing countries. Foreign investments may be seen as essential sources of technical and managerial knowledge, capital, jobs, and foreign exchange. As such, the significance of foreign investments as an immediate source of public revenue could pale next to their longer-term "ripple effect" on development. In the negotiation of tax treaties, then, a developing country might be expected to ignore revenue goals and accept substantial limitations on source-based taxation, at least insofar as such limitations could be expected to encourage investment.

Frequently, however, Third World nations take a considerably more aggressive approach, seeking treaty terms that, in effect, provide subsidies to private investors at the expense of First World treaty partners. The United States traditionally has followed a strict policy of "capital export neutrality", providing no tax incentives for investment in the Third World through either the Internal Revenue Code or tax treaty provisions.

Gender Problems in Medical Schools

Despite increasing enrollments of women in medical schools, feelings of isolation among women medical students persist. Women students still have to contend with the social stereotype of a male doctor. In addition, institutions themselves may unintentionally foster feelings of separateness. Comparatively few women are hired for faculty positions, thus offering women students few role models. The pervasive sexual humor of male doctors and students further

intensifies the woman students' alienation. Alienation, in turn, negatively affects individual self-perception.

As women enter medical study in increasing numbers, they may feel less at odds with their peers and the teaching establishment. Institutional bias will, no doubt, also change in response to changing societal values. However, we should not wait passively for gradual social processes to bring changes; schools must provide current students with support services designed to meet women's needs. In a recent study, 48 percent of the women questioned rated a student support group as the most important support service a school can provide.

New Towns

The idea of building "New Towns" to absorb growth is frequently considered a cure-all for urban problems. It is erroneously assumed that if new residents can be diverted from existing centers, the present urban situation at least will get no worse. It is further and equally erroneously assumed that since European New Towns have been financially and socially successful, we can expect the same sorts of results in the United States.

Present planning, thinking, and legislation will not produce the kinds of New Town that have been successful abroad. It will multiply suburbs or encourage developments in areas where land is cheap and construction profitable rather than where New Towns are genuinely needed.

Such ill-considered projects not only will fail to relieve pressures on existing cities but will, in fact, tend to weaken those cities further by drawing away high-income citizens and increasing the concentration of low-income groups that are unable to provide tax income. The remaining tax-payers, accordingly, will face increasing burdens, and industry and commerce will seek escape. Unfortunately, this mechanism is already at work in some metropolitan areas.

The promoters of New Towns so far in the United States have been developers, builders, and financial institutions. The main interest of these promoters is economic gain. Furthermore, federal regulations designed to promote the New Town idea do not consider social needs as the European New Town plans do. In fact, our regulations specify virtually all the ingredients of the typical suburban community, with a bit of political rhetoric thrown in.

A workable American New Town formula should be established as firmly here as the national formula was in Britain. All possible social and governmental innovations as well as financial factors should be thoroughly considered and accommodated in this policy. Its objectives should be clearly stated, and both incentives and penalties should be provided to ensure that the objectives are pursued. If such a policy is developed, then the New Town approach can play an important role in alleviating America's urban problem.

Health-care Economy

The health-care economy is replete with unusual and even unique economic relationships. One of the least understood involves the peculiar roles of producer or "provider" and purchaser or "consumer" in the typical doctor-patient relationship. In most sectors of the economy, it is the seller who attempts to attract a potential buyer with various inducements of price, quality, and utility, and it is the buyer who makes the decision. Where circumstances permit the buyer no choice because there is effectively only one seller and the product is relatively essential, government usually asserts monopoly and places the industry under price and other regulations. Neither of these conditions prevails in most of the health-care industry.

In the health-care industry, the doctor-patient relationship is the mirror image of the ordinary relationship between producer and consumer. Once an individual has chosen to see a physician – and even then there may be no real choice – it is the physician who usually makes all significant purchasing decisions: whether the patient should return "next Wednesday", whether X-rays are needed, whether drugs should be prescribed, etc. It is a rare and sophisticated patient who will challenge such professional decisions or raise in advance questions about price, especially when the ailment is regarded as serious.

This is particularly significant in relation to hospital care. The physician must certify the need for hospitalization, determine what procedures will be performed, and announce when the patient may be discharged. The patient may be consulted about some of these decisions, but in the main it is the doctor's judgments that are final. Little wonder then that in the eyes of the hospital it is the physician who is the real "consumer". As a consequence, the medical staff represents the "power center" in hospital policy and decision-making, not the administration.

Although usually there are in this situation four identifiable participants – the physician, the hospital, the patient, and the payer (generally an insurance carrier or government) – the physician makes the essential decisions for all of them. The hospital becomes an extension of the physician; the payer generally meets most of the bona fide bills generated by the physician/hospital; and for the most part the patient plays a passive role. In routine or minor illnesses, or just plain worries, the patient's options are, of course, much greater with respect to use and price. In illnesses that are of some significance, however, such choices tend to evaporate, and it is for these illnesses that the bulk of the health-care dollar is spent. We estimate that about 75-80 percent of health-care expenditures are determined by physicians, not patients. For this reason, economy measures directed at patients or the general public are relatively ineffective.

Alcoholism

The present day view of alcoholism as a physical disease was not a scientific discovery; it is a medical thesis that has developed only slowly over the past 200 years and amidst considerable

controversy. Historically, the moral perspective of the Judeo-Christian tradition has been that excessive use of alcohol is a willful act, one that leads to intoxication and other sinful behavior; but in the early nineteenth century, Benjamin Rush, a founder of American psychiatry, proposed that "The habit of drunkenness is a disease of the will." By the late nineteenth century, physicians generally viewed the habitual use of drugs such as opiates, tobacco, and coffee as a generic disorder stemming from biological vulnerability, either inherited or acquired.

Prohibition represented a triumph of the older morality over a modern medical concept. Where physicians who championed the disease concept of alcoholism emphasized the need for treatment, the Temperance Movement stressed that alcohol itself was the cause of drunkenness and advocated its control and eventually its prohibition. Scientific interest in alcoholism, dampened by Prohibition, revived toward the middle of the twentieth century, not because of any new scientific findings but because of humanitarian efforts to shift the focus from blame and punishment to treatment and concern.

The early 1960s witnessed a growing acceptance of the notion that, in certain "vulnerable" people, alcohol use leads to physical addiction – a true disease. Central to this concept of alcoholism as a disease were the twin notions of substance tolerance and physical dependence, both physical phenomenon. Substance tolerance occurs when increased doses of a drug are required to produce effects previously attained at lower dosages; physical dependence refers to the occurrence of withdrawal symptoms, such as seizures, following cessation of a drinking bout. In 1972, the National Council on Alcoholism outlined criteria for diagnosing alcoholism. These criteria emphasized alcohol tolerance and physical dependence and treated alcoholism as an independent disorder, not merely a manifestation of a more general and underlying personality disorder.

In 1977, a World Health Organization report challenged this disease model by pointing out that not everyone who develops alcohol-related problems exhibits true alcohol dependence. This important distinction between dependence and other drug-related problems that do not involve dependence was not immediately accepted by the American Psychiatric Association. The early drafts of the 1980 edition of its *Diagnostic and Statistical Manual of Mental Disorders* described a dependence syndrome for alcohol and other drugs in which tolerance and dependence were important, but not essential, criteria for diagnosis, but at the last moment, the inertia of history prevailed, and tolerance and dependence were both included not as necessary to diagnose dependence but as sufficient indicators in and of themselves.

It was not until 1993 that the American Psychiatric Association modified this position. In the fourth edition of the *Manual*, tolerance and withdrawal symptoms are the first two of seven criteria listed for diagnosing alcohol and other drug dependence, but the clinician is not required to find whether either is present or in what degree in order to make the diagnosis.

Despite the consensus among health professionals, we should not forget that the moral perspective on alcoholism is still very much alive. It perhaps does not surprise us that the Reverend J. E. Todd wrote an essay entitled "Drunkenness a Vice, Not a Disease" in 1882, but

we should be concerned that the book *Heavy Drinking*: *The Myth of Alcoholism as a Disease* was published in 1988. Even as late as the mid-1970s, sociologists were reporting that the term "alcoholic" was commonly used in the United States as a synonym for "drunkard", rather than as designation for someone with an illness or a disorder. Apparently, in the mind of nonprofessionals, the contradictory notions of alcoholism as a disease and alcoholism as a moral weakness can coexist quite comfortably.

Industrial Innovation

There is widespread belief that the emergence of giant industries has been accomplished by an equivalent surge in industrial research. A recent study of important inventions made since the turn of the century reveals that more than half were the product of individual inventors working alone, independent of organized industrial research. While industrial laboratories contributed such important products as nylon and transistors, independent inventors developed air conditioning, the automatic transmission, the jet engine, the helicopter, insulin, and streptomycin. Still other inventions, such as stainless steel, television, silicons, and plexiglass were developed through the combined efforts of individuals and laboratory teams.

Despite these findings, we are urged to support monopoly power on the grounds that such power creates an environment supportive of innovation. We are told that the independent inventor, along with the small firm, cannot afford to undertake the important research needed to improve our standard of living while protecting our diminishing resources; that only the prodigious assets of the giant corporation or conglomerate can afford the kind of expenditures that can produce the technological advances vital to economic progress. But when we examine expenditures for research, we find that of the more than $ 35 billion spent each year in this country, almost two-thirds is spent by the federal government. More than half of this government expenditure is funneled into military research and product development, accounting for the enormous increase in spending in such industries as nuclear energy, aircraft, missiles, and electronics. There are those who consider it questionable that these defense-linked research projects will account for an improvement in the standard of living or, alternately, do much to protect our diminishing resources.

Recent history has demonstrated that we may have to alter our long-standing conception of the process actuated by competition. The price variable, once perceived as the dominant aspect of the competitive process is now subordinated to the competition of the new product, the new business structure, and the new technology. While it can be assumed that in a highly competitive industry not dominated by a single corporation, investment in innovation – a risky and expensive budget item – might meet resistance from management and stockholders who might be more concerned with cost-cutting, efficient organization, and large advertising budgets, it would be an egregious error to assume that the monopolistic producer should be equated with bountiful expenditures for research. Large-scale enterprises tend to operate more comfortably in stable and secure circumstances, and their managerial bureaucracies tend to promote the status quo and

resist the threat implicit in change. Furthermore, the firm with a small share of the market will aggressively pursue new techniques and different products, since with little vested interest in capital equipment of plant it is not deterred from investment in innovation. In some cases, where inter-industry competition is reduced or even entirely eliminated, the industrial giants may seek to avoid capital loss resulting from obsolescence by deliberately obstructing technological progress.

The conglomerates are not, however, completely exempt from strong competitive pressures; there are instances in which they, too, must compete, as against another industrial Goliath, and then their weapons may include large expenditures for innovation.

Addressing Food Shortage

The promise of finding long-term technological solutions to the problem of world food shortages seems difficult to fulfill. Many innovations that were once heavily supported and publicized, such as fish-protein concentrate and protein from algae grown on petroleum substrates, have since fallen by the wayside. The proposals themselves were technically feasible, but they proved to be economically unviable and to yield food products culturally unacceptable to their consumers. Recent innovations such as opaque-2 maize, Antarctic krill, and the wheat-rye hybrid triticale seem more promising, but it is too early to predict their ultimate fate.

One characteristic common to unsuccessful food innovations has been that, even with extensive government support, they often have not been technologically adapted or culturally acceptable to the people for whom they had been developed. A successful new technology, therefore, must fit the entire sociocultural system in which it is to find a place. Security of crop yield, practicality of shortage, palatability, and costs are much more significant than had previously been realized by the advocates of new technologies. For example, the better protein quality in tortillas made from opaque-2 maize will be of only limited benefit to a family on the margin of subsistence if the new maize is not culturally acceptable or is more vulnerable to insects.

The adoption of new food technologies depends on more than these technical and cultural considerations; economic factors and governmental policies also strongly influence the ultimate success of any innovation. Economists in the Anglo-American tradition have taken the lead in investigating the economics of technological innovation. Although they exaggerate in claiming that profitability is the key factor guiding technical change – they completely disregard the substantial effects of culture – they are correct in stressing the importance of profits. Most technological innovations in agriculture can be fully used only by large landowners and are only adopted if these profit-oriented business people believe that the innovation will increase their incomes. Thus, innovations that carry high rewards for big agribusiness groups will be adopted even if they harm segments of the population and reduce the availability of food in a country. Further, should a new technology promise to alter substantially the profits and losses associated with any production system, those with economic power will strive to maintain and improve

their own positions. Since large segments of the populations of many developing countries are close to the subsistence margin and essentially powerless, they tend to be the losers in this system unless they are aided by a government policy that takes into account the needs of all sectors of the economy. Therefore, although technical advances in food production and processing will perhaps be needed to ensure food availability, meeting food needs will depend much more on equalizing economic power among the various segments of the populations within the developing countries themselves.

Impact of Free Trade

A newly issued report reveals in facts and figures what should have been known in principle, that quite a lot of business companies are going to go under during the coming decade, as tariff walls are progressively dismantled. Labor and capital valued at $ 12 billion are to be made idle through the impact of duty-free imports. As a result, 35,000 workers will be displaced. Some will move to other jobs and other departments within the same firm. Around 15,000 will have to leave the firm now employing them and work elsewhere.

The report is measuring exclusively the influence of free trade with Europe. The authors do not take into account the expected expansion of production over the coming years. On the other hand, they are not sure that even the export predictions they make will be achieved. For this presupposes that a suitable business climate lets the pressure to increase productivity materialize.

There are two reasons why this scenario may not happen. The first one is that industry on the whole is not taking the initiatives necessary to adapt fully to the new price situation it will be facing as time goes by.

This is another way of saying that the manufacturers do not realize what lies ahead. The government is to blame for not making the position absolutely clear. It should be saying that in ten years' time tariffs on all industrial goods imported from Europe will be eliminated. There will be no adjustment assistance for manufacturers who cannot adapt to this situation.

The second obstacle to adjustment is not stressed in the same way in the report; it is the attitude of the service sector. Not only are service industries unaware that the Common Market treaty concerns them too, they are artificially insulated from the physical pressures of international competition. The manufacturing sector has been forced to apply its nose to the grindstone for some time now, by the increasingly stringent import-liberalization program.

The ancillary services on which the factories depend show a growing indifference to their work obligations. They seem unaware that overmanned ships, underutilized container equipment in the ports, and repeated work stoppages slow the country's attempts to narrow the trade gap. The remedy is to cut the fees charged by these services so as to reduce their earnings – in exactly the same way that earnings in industrial undertakings are reduced by the tariff reduction program

embodied in the treaty with the European Community.

There is no point in dismissing 15,000 industrial workers from their present jobs during the coming ten years if all the gain in productivity is wasted by costly harbor, transport, financial, administrative and other services. The free trade treaty is their concern as well. Surplus staff should be removed, if need be, from all workplaces, not just from the factories. Efficiency is everybody's business.

Welfare Families

Many critics of the current welfare system argue that existing welfare regulations foster family instability. They maintain that those regulations, which exclude most poor husband-and-wife families from Aid to Families with Dependent Children assistance grants, contribute to the problem of family dissolution. Thus, they conclude that expanding the set of families eligible for family assistance plans or guaranteed income measures would result in a marked strengthening of the low-income family structure.

If all poor families could receive welfare, would the incidence of instability change markedly? The answer to this question depends on the relative importance of three categories of potential welfare recipients. The first is the "cheater" – the husband who is reported to have abandoned his family, but in fact disappears only when the social caseworker is in the neighborhood. The second consists of a loving husband and devoted father who, sensing his own inadequacy as a provider, leaves so that his wife and children may enjoy the relative benefit provided by public assistance. There is very little evidence that these categories are significant.

The third category is the unhappily married couple who remain together out of a sense of economic responsibility for their children, because of the high costs of separation, or because of the consumption benefits of marriage. This group is numerous. The formation, maintenance and dissolution of the family is in large part a function of the relative balance between the benefits and costs of marriage as seen by the individual members of the marriage. The major benefit generated by the creation of a family is the expansion of the set of consumption possibilities. The benefits from such a partnership depend largely on the relative dissimilarity of the resources or basic endowments each partner brings to the marriage. Persons with similar productive capacities have less economic "cement" holding their marriage together. Since the family performs certain functions society regards as vital, a complex network of social and legal buttresses has evolved to reinforce marriage. Much of the variation in marital stability across income classes can be explained by the variation in costs of dissolution imposed by society, e.g. division of property, alimony, child support, and the social stigma attached to divorce.

Marital stability is related to the costs of achieving an acceptance agreement on family consumption and production and to the prevailing social price of instability in the marriage partners' social-economic group. Expected AFDC income exerts pressures on family instability

by reducing the cost of dissolution. To the extent that welfare is a form of government-subsidized alimony payments, it reduces the institutional costs of separation and guarantees a minimal standard of living for wife and children. So welfare opportunities are a significant determinant of family instability in poor neighborhoods, but this is not the result of AFDC regulations that exclude most intact families for coverage. Rather, welfare-related instability occurs because public assistance lowers both the benefits of marriage and the costs of its disruption by providing a system of government-subsidized alimony payments.

Penalizing Drunk Driving

There is extraordinary exposure in the United States to the risks of injury and death from motor vehicle accidents. More than 80 percent of all households own passenger cars or light trucks and each of these is driven an average of more than 11,000 miles each year. Almost one-half of fatally injured drivers have a blood alcohol concentration (BAC) of 0.1 percent or higher. For the average adult, over five ounces of 80 proof spirits would have to be consumed over a short period of time to attain these levels. A third of drivers who have been drinking, but fewer than 4 percent of all drivers, demonstrate these levels. Although less than 1 percent of drivers with BAC's of 0.1 percent or more are involved in fatal crashes, the probability of their involvement is 27 times higher than for those without alcohol in their blood.

There are a number of different approaches to reducing injuries in which intoxication plays a role. Based on the observation that excessive consumption correlates with the total alcohol consumption of a country's population, it has been suggested that higher taxes on alcohol would reduce both. While the heaviest drinkers would be taxed the most, anymore who drinks at all would be penalized by this approach.

To make drinking and driving a criminal offense is an approach directed only at intoxicated drivers. In some states, the law empowers police to request breath tests of drivers cited for any traffic offense and elevated BAC can be the basis for arrest. The National Highway Traffic Safety Administration estimates, however, that even with increased arrests, there are about 700 violations for every arrest. At this level there is little evidence that laws serve as deterrents to driving while intoxicated. In Britain, motor vehicle fatalities fell 25 percent immediately following implementation of the Road Safety Act in 1967. As Britishers increasingly recognized that they could drink and not be stopped, the effectiveness declined, although in the ensuing three years the fatality rate seldom reached that observed in the seven years prior to the Act.

Whether penalties for driving with a high BAC or excessive taxation on consumption of alcoholic beverages will deter the excessive drinker responsible for most fatalities is unclear. In part, the answer depends on the extent to which those with high BAC's involved in crashes are capable of controlling their intake in response to economic or penal threat. Therapeutic programs which range from individual and group counseling and psychotherapy to chemotherapy constitute another approach, but they have not diminished the proportion of accidents in which

alcohol was a factor. In the few controlled trials that have been reported there is little evidence that rehabilitation programs for those repeatedly arrested for drunken behavior have reduced either the recidivism or crash rates. Thus far, there is no firm evidence that Alcohol Safety Action Project-supported programs, in which rehabilitation measures are requested by the court, have decreased recidivism or crash involvement for clients exposed to them, although knowledge and attitudes have improved. One thing is clear, however, unless we deal with automobile and highway safety and reduce accidents in which alcoholic intoxication plays a role, many will continue to die.

Discrimination against Black Women

The existence of both racial and sexual discrimination in employment is well documented, and policy makers and responsible employers are particularly sensitive to the plight of the black female employee on the theory that she is doubly the victim of discrimination. That there exist differences in income between whites and blacks is clear, but it is not so clear that these difference are solely the result of racial discrimination in employment. The two groups differ in productivity, so basic economics dictates that their incomes will differ.

To obtain a true measure of the effect of racial discrimination in employment it is necessary to adjust the gross black/white income ratio for these productivity factors. White women in urban areas have a higher educational level than black women and can be expected to receive larger incomes. Moreover, state distribution of residence is important because blacks are overrepresented in the South where wage rates are typically lower than elsewhere and where racial differentials in income are greater. Also, black are overrepresented in large cities; incomes of blacks would be greater if blacks were distributed among cities of different sizes in the same manner as whites.

After standardization for these productivity factors, the income of black urban women is estimated to be between 108 and 125 percent of the income of white women. This indicates that productivity factors more than account for the actual white/black income different for women. Despite their greater education, white women's *actual* median income is only 2 to 5 percent higher than that of black women in the North. Unlike the situation of men, the evidence indicates that the money income of black urban women was as great as, or greater than, that of whites of similar productivity in the North, and probably in the United States as a whole. For men, however, the adjusted black/white income ratio is approximately 80 percent.

At least two possible hypotheses may explain why the adjustment for productivity more than accounts for the observed income differential for women, whereas the income differential persists for men. First, there may be more discrimination against black men than against black women. The different occupational structures for men and women give some indication why this could be the case, and institutionalized considerations – for example, the effect of unionization in cutting competition – may also contribute. Second, the data are consistent with the hypothesis

that the intensity of discrimination against women differs little between whites and blacks. Therefore, racial discrimination adds little to the effects of existing sex discrimination.

These findings suggest that a black woman does not necessarily suffer relatively more discrimination in the labor market than does a white women. Rather, for women, the effects of sexual discrimination are so pervasive that the effects of racial discrimination are negligible. Of course, this is not to say that the more generalized racial discrimination of which black women, like black men, are victims does not disadvantage black women in their search for work. After all, one important productivity factor is level of education, and the difference between white and black women on this scale is largely the result of racial discrimination.

Affirmative Action

Reverse discrimination, minority recruitment, racial quotas, and, more generally, affirmative action are phrases that carry powerful emotional charges. But why should affirmative action, of all government policies, be so controversial? In a sense, affirmative action is like other government programs, e.g., defense, conservation and public schools. Affirmative action programs are designed to achieve legitimate government objectives such as improved economic efficiency, reduced social tension and general betterment of the public welfare. While it cannot be denied that there is no guarantee that affirmative action will achieve these results, neither can it be denied that there are plausible, even powerful, sociological and economic arguments pointing to its likely success.

Government programs, however, entail a cost, i.e., the expenditure of social or economic resources. Setting aside cases in which the specific user is charged a fee for service (toll roads and tuition at state institutions), the burdens and benefits of publicly funded or mandated programs are widely shared. When an individual benefits personally from a government program, it is only because she or he is one member of a larger beneficiary class, e.g., a farmer; and most government revenue is obtained through a scheme of general taxation to which all are subject.

Affirmative action programs are exceptions to this general rule, though not, as it might at first seem, because the beneficiaries of the programs are specific individuals. It is still the case that those who ultimately benefit from affirmative action do so only by virtue of their status as a member of a larger group, a particular minority. Rather the difference is the location of the burden. In affirmative action, the burden of "funding" the program is not shared universally, and that is inherent in the nature of the case, as can be seen clearly in the case of affirmative action in employment. Often job promotions are allocated along a single dimension – seniority. When an employer promotes a less senior worker from a minority group, the person disadvantaged by the move is easily identified: the worker with greatest seniority on a combined minority-nonminority list passed over for promotion.

Now we are confronted with two competing moral sentiments. On the one hand, there is the idea

that those who have been unfairly disadvantaged by past discriminatory practices are entitled to some kind of assistance. On the other, there is the feeling that no person ought to be deprived of what is rightfully his, even for the worthwhile service of his fellow humans. In this respect, disability due to past racial discrimination, at least in so far as there is no connection to the passed-over worker, is like a natural evil. When a villainous man willfully and without provocation strikes and injures another, there is not only the feeling that the injured person ought to be compensated but there is also consensus that the appropriate party to bear the cost is the one who inflicted the injury. Yet, if the same innocent man stumbled and injured himself, it would be surprising to hear someone argue that the villainous man ought to be taxed for the injury simply because he might have tripped the victim had he been given the opportunity. There may very well be agreement that the victim should be aided in his recovery with money and personal assistance, and many will give willingly, but there is also agreement that no one individual ought to be singled out and forced to do what must ultimately be considered an act of charity.

Living Standards

It would be enormously convenient to have a single, generally accepted index of the economic and social welfare of the people of the United States. A glance at it would tell us how much better or worse off we had become each year, and we would judge the desirability of any proposed action by asking whether it would raise or lower this index. Some recent discussion implies that such an index could be constructed. Articles in the popular press even criticize the Gross National Production (GNP) because it is not such a complete index of welfare, ignoring, on the one hand, that it was never intended to be, and suggesting, on the other, that with appropriate changes it could be converted into one.

The output available to satisfy our wants and needs is one important determinant of welfare. Whatever want, need, or social problem engages our attention, we ordinarily can more easily find resources to deal with it when output is large and growing than when it is not. GNP measures output fairly well, but to evaluate welfare we would need additional measures which would be far more difficult to construct. We would need an index of real costs incurred in production, because we are better off if we get the same output at less cost. Use of just man-hours for welfare evaluation would unreasonably imply that to increase total hours by raising the hours of eight women from 60 to 65 a week imposes no more burden than raising the hours of eight men from 40 to 45 a week, or even than hiring one involuntarily unemployed person for 40 hours a week. A measure of real costs of labor would also have to consider working conditions. Most of us spend almost half of our waking hours on the job and our welfare is vitally affected by the circumstances in which we spend those hours.

To measure welfare we would need a measure of changes in the need our output must satisfy. One aspect, population change, is now handled by converting output to a per capita basis on the assumption that, other things equal, twice as many people need twice as many goods and service

to be equally well off. But an index of needs would also account for differences in the requirements for living as the population becomes more urbanized and suburbanized; for the changes in national defense requirements; and for changes in the effect of weather on our needs. The index would have to tell us the cost of meeting our needs in a base year compared with the cost of meeting them equally well under the circumstances prevailing in every other year.

Measures of "needs" shade into measures of the human and physical environment in which we live. We all are enormously affected by the people around us. Can we go where we like without fear of attack? We are also affected by the physical environment – purity of water and air, accessibility of parkland and other conditions. To measure this requires accurate data, but such data are generally deficient. Moreover, weighting is required: to combine robberies and murders in a crime index; to combine pollution of the Potomac and pollution of Lake Erie into a water pollution index; and then to combine crime and water pollution into some general index. But there is no basis for weighting these beyond individual preference.

There are further problems. To measure welfare we would need an index of the "goodness" of the distribution of income. There is surely consensus that given the same total income and output, a distribution with fewer families in poverty would be better, but what is the ideal distribution? Even if we could construct indexes of output, real costs, needs, state of the environment, we could not compute a welfare index because we have no system of weights to combine them.

University

Like our political society, the university is under severe attack today and perhaps for the same reason; namely, that we have accomplished much of what we have set out to do in this generation, that we have done so imperfectly, and while we have been doing so, we have said a lot of things that simply are not true. For example, we have earnestly declared that full equality of opportunity in universities exists for everyone, regardless of economic circumstance, race or religion. This has never been true. When it was least true, the assertion was not attacked. Now that it is nearly true, not only the assertion but the university itself is locked in mortal combat with the seekers of perfection.

In another sense the university has failed. It has stored great quantities of knowledge; it teaches more people; and despite its failures, it teaches them better. It is in the application of this knowledge that the failure has come. Of the great branches of knowledge – the sciences, the social sciences and humanities – the sciences are applied, sometimes almost as soon as they are learned. Strenuous and occasionally successful efforts are made to apply the social sciences, but almost never are the humanities well applied. We do not use philosophy in defining our product. We do not use literature as a source of real and vicarious experience to save us the trouble of living every life again in our own.

The great tasks of the university in the next generation are to search the past to form the future,

to begin an earnest search for a new and relevant set of values, and to learn to use the knowledge we have for the questions that come before us. The university should use one-fourth of a student's time in his undergraduate years and organize it into courses which might be called history, and literature and philosophy, and anything else appropriate and organize these around primary problems. The difference between a primary problem and a secondary or even tertiary problem is that primary problems tend to be around for a long time, whereas the less important ones get solved.

One primary problem is that of interfering with what some call human destiny and other call biological development, which is partly the result of genetic circumstance and partly the result of accidental environmental conditions. It is anticipated that the next generation, and perhaps this one, will be able to interfere chemically with the actual development of an individual and perhaps biologically by interfering with his genes. Obviously, there are benefits both to individuals and to society from eliminating, or at least improving, mentally and physically deformed persons. On the other hand, there could be very serious consequences if this knowledge were used with premeditation to produce superior and subordinate classes, each genetically prepared to carry out a predetermined mission. This can be done, but what happens to free will and the rights of the individual? Here we have a primary problem that will still exist when we are all dead.

Of course, the traditional faculty members would say, "But the students won't learn enough to go to graduate school." And certainly they would not learn everything we are in the habit of making them learn, but they would learn some other things. Surely, in the other three-quarters of their time, they would learn what they usually do, and they might even learn to think about it by carrying new habits into their more conventional courses. The advantages would be overwhelmingly greater than the disadvantages. After all, the purpose of education is not only to impart knowledge but to teach students to use the knowledge that they either have or will find, to teach them to ask and seek answers for important questions.

Early Bicycles

The bicycle, with a history that spans nearly two centuries, has frequently been looked upon in the United States as a child's plaything. Recent trends seem to indicate that America may come to follow the example of those other nations where the bicycle is an important means of transportation, extensively used by businessmen and workers traveling to and from their jobs. In the United States, during the late 19th century, the cycle's greatest use was likewise among adults, and this use sparked the early good-roads movement. Of equal importance was the role of the bicycle in demonstrating the possibilities of independent personal transportation, thus creating a demand that facilitated the introduction of the automobile.

The first known bicycle was shown by the Comte de Sivrac, who in 1791 was seen riding a two-wheel "wooden horse" in the gardens of the Palais Royal in Paris. Called a *célérifère*, the

machine had two rigidly mounted wheels, so that it was incapable of being steered. To change direction, it was necessary to lift, drag, or jump the front wheel to one side. In 1793 the name was changed to vélocifere, and, as these machines became increasingly popular among the sporting set of Paris, clubs were formed and races were run along the Champs Elysées.

At some time during the first decade of the 19th century the vélocifere lost favor temporarily until, in 1816, Nicephore Niepce of Chalons, better known as the "Father of Photography", demonstrated and improved type in the Luxembourg Gardens. Niepce's machine, still not steerable, was considerably lighter, and the larger wheels helped smooth the ride and permitted greater speed.

A revolutionary improvement in the vélocifere occurred in 1817, when Charles, Baron von Drais, of Sauerbrun, devised a front wheel capable of being steered. As chief forester for the Grand Duke of Baden, von Drais found the machine useful in traversing the forest land under his supervision. He also gave it a padded saddle, and an armrest in front of his body, which assisted him in exerting force against the ground. Granted a patent in 1818, he took his Draisienne to Paris, where it was again patented and acquired the name velocipede, a term that was to continue in use until about 1869 when the word "bicycle" came into use.

The velocipede gained rapid popularity in France, and almost immediately migrated to England, where it was known variously as a Draisine, Swiftwalker, Hobby Horse, Dandy Horse, or Pedestrian Curricle. In England one of its chief exponents was the London coachmaker, Denis Johnson, who not only added improvements, but even designed a woman's drop-frame model. Riding academies were established to teach the fine points of balance and management, and soon many riders were seen in the streets and parks about London; yet the pastime declined almost as rapidly as it had risen, and after the early 1820s velocipedes were rarely seen.

In the United States, W.K. Clarkson, Jr., of New York, was granted a patent for a velocipede on June 26, 1819, but it is no longer known what this patent covered, for the records were destroyed in the Patent Office fire of 1836. There is no evidence that the sport gained much popularity here, yet it is known that Charles Wilson Peale, the noted American portrait painter, was an enthusiastic rider of one in 1819, at the age of 78.

Crime Prevention

Most of the plans and programs for diminishing crime by means of comprehensive community organization have made prevention their salient purpose. However, the underlying concepts on which such programs are based suffer from inconsistency and confusion. It would be inaccurate to speak as if concise, clear, and explicit models for crime prevention existed, especially since writing and discussion on the subject often have been more ideological than scientific.

One conception heavily weighted with ideology is the argument that crime can be prevented by

massive or total programs of social and economic amelioration directed at the root causes of crime in society as a whole. The assumption is that eliminating deleterious social conditions such as poverty, malnutrition, disease, poor housing, family disorganization, unemployment, and racial discrimination will make crime disappear. Crime is traced to a pathological or dilapidated social structure, and only a thoroughgoing renovation or replacement of that structure will usher in a crimeless society. This conception has revolutionary overtones harking back to older socialist beliefs that poverty or class exploitation causes crime. Among the methods it advocates to solve social problems is the activation of some forms of popular democracy.

Another form of social amelioration more sophisticated in conception has been loosely designated as "opportunity theory". This conception holds that crime results from psychic pressures in individuals who are culturally indoctrinated with achievement values and yet have no opportunity for upward mobility because of their unfortunate position in a rigid social structure. Those so disadvantaged are primarily youths in the lower socio-economic strata. Amelioration inspired by opportunity theory employs vaguely martial imagery: it speaks of the "mobilization" of community resources to make "war" on poverty.

Broad-scale programs of social and cultural amelioration may be desirable or necessary at times, but since they fail to explain why some poverty-stricken youths turn to crime while others do not, their efficacy in eradicating and preventing crime is questionable at best. So far only one country, the Soviet Union, has conducted a large-scale revolutionary experiment in social amelioration, and the results have not been affirmative: Soviet authorities are still plagued by juvenile crime. This experiment suggests that social amelioration is too diffuse in its impact to be an effective means of crime prevention.

Television Violence

In a recent survey, Garber and Holtz concluded that the average half-hour children's television show contains 47 violent acts. When asked about the survey, network television executive Jean Pater responded, "I sure as heck don't think that Bugs Bunny's pouring a glass of milk over a chipmunk's head is violence." Unfortunately, both Garber and Holtz and Pater beg the question. The real issue is whether children view such acts as violence.

The violence programming aimed at children almost always appears in the context of fantasy. Cartoon violence generally includes animation, humor, and a remote setting; make-believe violence generally uses only the first two cues; realistic, acted violence, which is not used in programming for children, depends entirely on the viewer's knowledge that the portrayal is fictional. Most children as young as four years can distinguish these three contexts, though there is no support for the idea that children, especially young children, can differentiate types of violence on a cognitive or rational basis – for example, by justification of the motives for the violent behavior.

There is no evidence of direct imitation of television violence by children, though there is evidence that fantasy violence can energize previously learned aggressive responses, such as a physical attack on another child during play. It is by no means clear, however, that the violence in a portrayal is solely responsible for this energizing effect. Rather, the evidence suggests that any exciting material can trigger subsequent aggressive behavior and that it is the excitation rather than the portrayal of violence that instigates or energizes any subsequent violent behavior. "Cold" imitation violence by children is extremely rare, and the very occasional evidence of direct, imitative associations between television violence and aggressive behavior has been limited to extremely novel and violent acts by teenagers or adults with already established patterns of deviant behavior. The instigational effect means, in the short term, that exposure to violent portrayals could be dangerous if shortly after the exposure (within 15 to 20 minutes), the child happens to be in a situation that calls for interpersonal aggression as an appropriate response – for example, an argument between siblings or among peers. This same instigational effect, however, could be produced by other exciting but nonviolent television content or by any other excitational source, including, ironically, a parent's turning off the set.

So there is no convincing causal evidence of any cumulative instigational effects such as more aggressive or violent dispositions in children. In fact, passivity is a more likely long-term result of heavy viewing of television violence. The evidence does not warrant the strong conclusions advanced by many critics who tend to use television violence as a scapegoat to draw public attention away from the real causes and parents and a culture that celebrates violence generally.

Objectives of Sociology

The fundamental objectives of sociology are the same as those of science generally – discovery and explanation. To discover the essential data of social behavior and the connections among the data is the first objective of sociology. To explain the data and the connections is the second and larger objective. Science makes its advances in terms of both of these objectives. Sometimes it is the discovery of a new element or set of elements that marks a major breakthrough in the history of a scientific discipline. Closely related to such discovery is the discovery of relationships of data that had never been noted before. All of this is, as we know, of immense importance in science. But the drama of discovery, in this sense, can sometimes lead us to overlook the greater importance of explanation of what is revealed by the data. Sometimes decades, even centuries, pass before known connections and relationships are actually explained. Discovery and explanation are the two great interpenetrating, interacting realms of science.

The order of reality that interests the scientists is the empirical order, that is, the order of data and phenomena revealed to us through observation or experience. To be precise or explicit about what is, and is not, revealed by observation is not always easy, to be sure. And often it is necessary for our natural powers of observation to be supplemented by the most intricate of mechanical aids for a given object to become "empirical" in the sense just used. That the electron is not as immediately visible as is the mountain range does not mean, obviously, that it is any less

empirical. That social behavior does not lend itself to as quick and accurate description as, say, chemical behavior of gases and compounds does not mean that social roles, statuses, and attitudes are any less empirical than molecules and tissues. What is empirical and observable today may have been nonexistent in scientific consciousness a decade ago. Moreover, the empirical is often data inferred from direct observation. All of this is clear enough, and we should make no pretense that there are not often shadow areas between the empirical and the nonempirical. Nevertheless, the first point to make about any science, physical or social, is that its world of data is the empirical world. A very large amount of scientific energy goes merely into the work of expanding the frontiers, through discovery, of the known, observable, empirical world.

From observation or discovery we move to explanation. The explanation sought by the scientist is, of course, not at all like the explanation sought by the theologian or metaphysician. The scientist is not interested – not, that is, in his role of scientist – in ultimate, transcendental, or divine causes of what he sets himself to explain. He is interested in explanations that are as empirical as the data themselves. If it is the high incidence of crime in a certain part of a large city that requires explanation, the scientist is obliged to offer his explanation in terms of factors which are empirically real as the phenomenon of crime itself. He does not explain the problem, for example, in terms of references to the will of God, demons, or original sin. A satisfactory explanation is not only that is empirical, however, but one that can be stated in the terms of a causal proposition. Description is an indispensable point of beginning, but description is not explanation. It is well to stress this point, for there are all too many scientists, or would-be scientists, who are primarily concerned with data gathering, data counting, and data describing, and who seem to forget that such operations, however useful, are but the first step. Until we have accounted for the problem at hand, explained it causally by referring the data to some principle or generalization already established, or to some new principle or generalization, we have not explained anything.

Filial Responsibility

The legal systems of the American colonies adopted the Elizabethan poor law, including its concept of filial responsibility for an aged parent; but from the beginning, Americans held two ideas that were antithetical to filial responsibility. First, in America, children assumed an importance they had not had in Europe. "In a new world," as Calhoun has written, "men face the future and worship, not ancestors, but posterity." Second, in an egalitarian atmosphere, every person is important in himself. Once an individual reaches maturity, not even family ties interfere with the full exercise of independent choice.

These concepts, however, did not collide with the principle of filial responsibility until nearly the twentieth century. The reasons for the postponement are clear. Not only was the family in an agricultural, frontier country an economic unit, but the parents owned the farm and equipment. In the earlier stages of industrialization, the family – specifically the father – owned the machinery

used at home; later, the father committed the family to work in a particular factory. Though the mother was not the proprietor, so to speak, of the family economic unit, her situation in old age was little different from that of the father. When her husband died, management, but not legal possession, might pass to a son, and the mother continued with homemaking and other productive activities. The young adult thus was bound in the familial economic unit by more than filial feeling or social pressure. When he left home, he left behind the means of earning a living. It was both more difficult for him to leave than it is today and less of a financial blow to his parents.

The preindustrial economy had tended to assure income to parents in ways other than through parental ownership, without requiring moral choice. Income was family income, consisting chiefly of subsistence items that the family shared. The availability of free land meant that the parents' property did not have to be divided among the children, which tended to support parents' control over their property. Perhaps most important, few persons were retired; as late as 1900, average life expectancy was only 47 years. Thus, some parents before the Civil War relied on the voluntary help of their children. But they were few – by percentage and by number – compared with parents in the same situation today.

With industrialization, the issue began to be raised. In 1868, veterans' aid legislation first provided for dependent fathers, though it had included dependent wives and children for some time. The change has been attributed to the beginning of the breakup of farm family homes. As the aged population increased and fewer of the elderly controlled their own situations, support of the aged became an issue. When the economy began to separate wages from ownership and the aged person was no longer in control, adult children had to examine their willingness to help their parents. Present-day discussion of this situation often implies that young people in the eighteenth and nineteenth centuries felt a duty to support their aged parents voluntarily, out of a sense of gratitude or obligation alone. That does not seem to have been the case. Only in the twentieth century did the idea achieve wide currency that an adult should sacrifice his or her own resources to assist parents before the community as a whole would assume responsibility. The idea survives as folk history about a golden age that never was.

Policemen's Writings

I decided to begin the term's work with the short story since that form would be the easiest for [the police officers], not only because most of their reading up to then had probably been in that genre; but also because a study of the reaction of people to various situations was something they relied on in their daily work. For instance, they had to be able to predict how others would react to their directives and interventions before deciding on their own form of action; they had to be able to take in the details of a situation quickly and correctly before intervening. No matter how factual and sparse police reports may seem to us, they must make use of a selection of vital detail, similar to that which a writer of a short story has to make.

This was taught to me by one of my students, a captain, at the end of the term. I had begun the study of the short story by stressing the differences between a factual report, such as a scientist's or a policeman's report, and the presentation of a creative writer. While a selection of necessary details is involved in both, the officer must remain neutral and clearly try to present a picture of the facts, while the artist usually begins with a preconceived message or attitude which is then transmitted through the use of carefully selected details of action described in words intended to provoke associations and emotional reactions in the reader. Only at the end of the term did the captain point out to me that he and his men also try to evaluate the events they describe and that their description of a sequence of events must of necessity be structured and colored by their understanding of what has taken place.

The policemen's reactions to events and characters in the stories were surprisingly unprejudiced ... They did not object to writers whose stories had to do with their protagonist's rebellion against society's accepted values. Nor did stories in which the strong father becomes the villain and in which our usual ideal of manhood are turned around offend them. The many hunters among my students readily granted the message in those hunting tales in which sensitivity triumphs over male aggressiveness, stories that show the boy becoming a man because he fails to shoot the deer, goose, or catbird. The only characters they did object to were those they thought unrealistic. As the previous class had done, this one also excelled in interpreting the ways in which characters reveal themselves, subtly manipulate and influence each other; they, too, understood how the story usually saves its insight, its revelation, for the end.

This almost instinctive grasp of the writing of fiction was revealed when the policemen volunteered to write their own short stories ... They not only took great pains with plot and character, but with style and language. The stories were surprisingly well written, revealing an understanding of what a solid short story must contain: the revelation of character, the use of background description and language to create atmosphere and mood, the need to sustain suspense and yet make each event as it occurs seem natural, the insight achieved either by the characters in the story or the reader or both. They tended to favor surprise endings. Some stories were sheer fantasies, or derived from previous reading, films, or television shows. Most wrote stories, obviously based on their own experiences, that revealed the amazing distance they must put between their personal lives and their work, which is part of the training for being a good cop. These stories, as well as their discussions of them, showed how coolly they judged their own weaknesses as well as the humor with which they accepted some of the difficulties or injustices of existence. Despite their authors' unmistakable sense of irony and awareness of corruption, these stories demonstrated how clearly, almost naively, these policemen wanted to continue to believe in some of the so-called American virtues – that courage is worth the effort and will be admired; that hard work will be rewarded; that life is somehow good; and that, despite the weariness, boredom, and occasional ugliness and danger, despite all their dislike of most of their routine and despite their own occasional grousing and complaints, they somehow did like being cops; that life, even in a chaotic and violent world, is worth it after all.

Higher Education and Service of Community

In the past, American colleges and universities were created to serve a dual purpose – to advance learning and to offer a chance to become familiar with bodies of knowledge already discovered to those who wished it. To create and to impart, these were the hallmarks of American higher education prior to the most recent, tumultuous decades of the twentieth century. The successful institution of higher learning had never been one whose mission could be defined in terms of providing vocational skills or as a strategy for resolving societal problems. In a subtle way Americans believed postsecondary education to be useful, but not necessarily of immediate use. What the student obtained in college became beneficial in later life – residually, without direct application in the period after graduation.

Another purpose has now been assigned to the mission of American colleges and universities. Institutions of higher learning – public or private – commonly face the challenge of defining their programs in such a way as to contribute to the service of the community.

This service role has various applications. Most common are programs to meet the demands of regional employment markets, to provide opportunities for upward social and economic mobility, to achieve racial, ethnic, or social integration, or more generally to produce "productive" as compared to "educated" graduates. Regardless of its precise definition, the idea of a service-university has won acceptance within the academic community.

One need only be reminded of the change in language describing the two-year college to appreciate the new value currently being attached to the concept of a service-related university. The traditional two-year college has shed its pejorative "junior" college label and is generally called a "community" college, a clearly value-laden expression representing the latest commitment in higher education. Even the doctoral degree, long recognized as a required "union card" in the academic world, has come under severe criticism as the pursuit of learning for its own sake and the accumulation of knowledge without immediate application to a professor's classroom duties. The idea of a college or university that performs a triple function – communicating knowledge to students, expanding the content of various disciplines, and interacting in a direct relationship with society – has been the most important change in higher education in recent years.

This novel development is often overlooked. Educators have always been familiar with those parts of the two-year college curriculum that have a "service" or vocational orientation. Knowing this, otherwise perceptive commentaries on American postsecondary education underplay the impact of the attempt of colleges and universities to relate to, if not resolve, the problems of society. Whether the subject under review is student unrest, faculty tenure, the nature of the curriculum, the onset of collective bargaining, or the growth of collegiate bureaucracies, in each instance the thrust of these discussions obscures the larger meaning of the emergence of the service-university in American higher education. Even the highly regarded critique of Clark Kerr, currently head of the Carnegie Foundation, which set the parameters of academic debate around

the evolution of the so-called "multiversity", failed to take account of this phenomenon and the manner in which its fulfillment changed the scope of higher education. To the extent that the idea of "multiversity" centered on matters of scale – how big is too big? How complex is too complex? – it obscured the fundamental question posed by the service-university: what is higher education supposed to do? Unless the commitment to what Samuel Gould has properly called the "communiversity" is clearly articulated, the success of any college or university in achieving its service-education functions will be effectively impaired ...

The most reliable report about the progress of Open Admissions became available at the end of August, 1974. What the document showed was that the dropout rate for all freshmen admitted in September, 1970, after seven semesters, was about 48 percent, a figure that corresponds closely to national averages at similar colleges and universities. The discrepancy between the performance of "regular" students (those who would have been admitted into the four-year colleges with 80% high school averages and into the two-year units with 75%) and Open Admissions freshmen provides a better indication of how the program worked.

Taken together the attrition rate (from known and unknown causes) was 48 percent, but the figure for regular students was 36 percent while for Open Admissions categories it was 56 percent. Surprisingly, the statistics indicated that the four-year colleges retained or graduated more of the Open Admissions students than the two-year colleges, a finding that did not reflect experience elsewhere. Not surprisingly, perhaps, the figures indicated a close relationship between academic success defined as retention or graduation and high school averages. Similarly, it took longer for the Open Admissions students to generate college credits and graduate than regular students, a pattern similar to national averages. The most important statistics, however, relate to the findings regarding Open Admissions students, and these indicated as a projection that perhaps as many as 70 percent would not graduate from a unit of the City University.

New England Mill Girls

From 1840 to 1845, New England mill owners sponsored the publication of the *Lowell Offering*, a collection of writings by female millhands. Perhaps predictably, its pages largely offer idealized vignettes of "millgirls" working selflessly to support their orphaned siblings or widowed mothers. Recent demographic research has provided a more complex view, one with positive and negative sides.

The industrialization of textile production after 1815 brought sweeping changes in the economy of New England family farm. The hand-spun textiles with which many families had supplemented their incomes could not compete with cheaper factory-spun cloth; but the factories created a new role for the farm daughter as paid hand. The family she left behind would profit from a share of her wages, while she gained access to money – whether to save or to spend on the consumer goods created by the new industrial society. Thus, mill work was often a deliberate step toward personal advancement from a limited, but not destitute, farm background.

For most of the native-born millgirls of the 1820s and '30s, factory work brought a move away from their families into a new social structure, the company-owned boardinghouse. Strictly controlled by mill management, which at first required millgirls without local families to reside in company housing, these all-female establishments fostered strong friendships, as well as the strivings for cultural expression reflected in the Offering. The company boardinghouse reinforced an existing homogeneity of age and socioeconomic background with the intense community shared by women living and working together twenty-four hours a day. Ironically, this may well have played an important role in forging the solidarity reflected in the early strikes and "turnouts" of millgirls.

The influx of Irish immigrants after 1845 had important effects on this nascent female labor activism. Yankee farm girls typically retained family ties and the possibility of returning home; in contrast, the families that immigrated from famine-stricken Ireland were here to stay. By the 1850s, the typical woman millhand was no longer working from choice, but from the economic necessity of providing support for her family. This change in the workforce brought a shift in housing patterns. More and more women workers lived at home rather than in company housing; thus family loyalties (and, one infers, housekeeping responsibilities) replaced the earlier workers' communal ties. One consequence of these changes was the transformation of worker protest into a male-dominated political movement.

第七部分　　物理、化学、光学、数学、天文学、电子学

What Constitutes Matter

We now know that what constitutes practically all of matter is empty space; relatively enormous voids in which revolve with lightning velocity infinitesimal particles so utterly small that they have never been seen or photographed. The existence of these particles has been demonstrated by mathematical physicists and their operations determined by ingenious laboratory experiments. It was not until 1911 that experiments by Sir Ernest Rutherford revealed the architecture of the mysterious atom. Moseley, Bohr, Fermi, Millikan, Compton, Urey, and others have also worked on the problem.

Matter is composed of molecules whose average diameter is about 1/125 millionth of an inch. Molecules are composed of atoms so small that about 5 million could be placed in a row on the period at the end of this sentence. Long thought to be the ultimate, indivisible constituent of matter, the atom has been found to consist roughly of a proton, the positive electrical element in the atomic nucleus, surrounded by electrons, the negative electric elements swirling about the proton.

New Physics

The classical idea of matter was something with solidity and mass, like wet stone dust pressed in a fist. If matter was composed of atoms, then the atoms too must have solidity and mass. At the beginning of the twentieth century the atom was imagined as a tiny billiard ball or a granite pebble writ small. Then, in the physics of Niels Bohr, the miniature billiard ball became something akin to a musical instrument, a finely tuned Stradivarius 10 billion times smaller than the real thing. With the advent of quantum mechanics, the musical instrument gave way to pure music. On the atomic scale, the solidity and mass of matter dissolved into something light and airy. Suddenly physicists were describing atoms in the vocabulary of the composer "resonance", "frequency", "harmony", "scale". Atomic electrons sang in choirs like seraphim, cherubim, thrones, and dominions. Classical distinctions between matter and light became muddled. In the new physics, light bounced about like particles, and matter undulated in waves like light.

In recent decades, physicists have uncovered elegant subatomic structures in the music of matter. They use a strange new language to describe the subatomic world: *quark*, *squark*, *gluon*, *gauge*, *technicolor*, *flavor*, *strangeness*, *charm*. There are *up quarks* and *down quarks*, *top quarks* and *bottom quarks*. There are particles with *truth* and *antitruth*, and there are particles with *naked beauty*. The simplest of the constituents of ordinary matter – the proton, for instance – has taken on the character of a Bach fugue, a four-point counterpoint of matter, energy, space, and time. At

matter's heart there are arpeggios, chromatics, syncopation. On the lowest rung of the chain of being, Creation dances.

The Satellites of Jupiter

The four Galilean satellites of Jupiter probably experienced early, intense bombardment. Thus, the very ancient surface of Callisto remains scarred by impact craters. The younger, more varied surface of Ganymede reveals distinct light and dark areas. Although craters dot the dark areas, the light areas feature networks of intersecting grooves and ridges, probably resulting from later iceflows. The impact sites of Europa have been almost completely erased, apparently by water outflowing from the interior and instantly forming vast, low, frozen seas. Satellite photographs of Io, the closest of the four to Jupiter, were revelatory. They showed a landscape dominated by volcanoes, many erupting, making Io the most tectonically active object in the solar system. Since a body as small as Io cannot supply the energy for such activity, the accepted explanation has been that, forced into a highly eccentric orbit, Io is engulfed by tides stemming from a titanic contest between the other three Galilean moons and Jupiter.

The Global Wind

While many different influences determine local air movements, the large-scale motion of winds over the earth's surface depends on two factors. The first is differential heating. Equatorial air absorbs more solar energy than air at higher latitudes. Thus it rises, and cool air from higher latitudes flows under it, while the equatorial air flows toward the poles. Eventually it cools and sinks, continuing as surface wind. Hence, surface winds move toward the equator at low latitudes and toward the poles at higher latitudes.

Global wind motions are also affected by the Coriolis effect, which influences objects moving within a rotating system such as the earth. Objects on the earth's surface move eastward at the same speed as the earth's rotation – about 1,000 miles per hour at the equator, basically zero at the poles. An air mass that has moved north or south from the equator retains this inertial velocity, but the earth it passes over is moving more slowly. Hence, the air is deflected to the east. Winds from the poles toward the equator, on the other hand, have a low velocity compared to the area they pass over; they are deflected toward the west.

Supernova Explosions

About twice every century, one of the massive stars in our galaxy blows itself apart in a supernova explosion that sends massive quantities of radiation and matter into space and

generates shock waves that sweep through the arms of the galaxy. The shock waves heat the interstellar gas, evaporate small clouds, and compress larger ones to the point at which they collapse under their own gravity to form new stars. The general picture that has been developed for the supernova explosion and its aftermath goes something like this. Throughout its evolution, a star is much like a leaky balloon. It keeps its equilibrium figure through a balance of internal pressure against the tendency to collapse under its own weight. The pressure is generated by nuclear reactions in the core of the star which must continually supply energy to balance the energy that leaks out in the form of radiation. Eventually the nuclear fuel is exhausted, and the pressure drops in the core. With nothing to hold it up, the matter in the center of the star collapses inward, creating higher and higher densities and temperatures, until the nuclei and electrons are fused into a superdense lump of matter known as a neutron star.

As the overlying layers rain down on the surface of the neutron star, the temperature rises until, with a blinding flash of radiation, the collapse is reversed. A thermonuclear shock wave runs through the now expanding stellar envelope, fusing lighter elements into heavier ones and producing a brilliant visual outburst that can be as intense as the light of 10 billion suns. The shell of matter thrown off by the explosion plows through the surrounding gas, producing an expanding bubble of hot gas, with gas temperatures in the millions of degrees. This gas will emit most of its energy at X-ray wavelengths, so it is not surprising that X-ray observatories have provided some of the most useful insights into the nature of the supernova phenomenon. More than twenty supernova remnants have now been detected in X-ray studies.

Recent discoveries of meteorites with anomalous concentrations of certain isotopes indicate that a supernova might have precipitated the birth of our solar system more than four and a half billion years ago. Although the cloud that collapsed to form the Sun and the planets was composed primarily of hydrogen and helium, it also contained carbon, nitrogen, and oxygen, elements essential for life as we know it. Elements heavier than helium are manufactured deep in the interior of stars and would, for the most part, remain there if it were not for the cataclysmic supernova explosions that blow giant stars apart. Additionally, supernova produce clouds of high-energy particles called cosmic rays. These high-energy particles continually bombard the Earth and are responsible for many of the genetic mutations that are the driving force of the evolution of species.

Automaton

Early in the 19th century, Napoleon sat across a chessboard from a robot swathed in the robes of a Turk. Napoleon moved his chessmen into battle; the Turk did the same. Then, when Napoleon blundered three times in succession, the audacious machine swept the board clean with an iron hand.

The chess-playing Turk had been constructed by Baron von Kempelen; it took on all comers until Edgar Allan Poe deduced that beneath the Turk's chess table resided a diminutive chess

expert who manipulated the various controls that gave life to the machine. Those were the innocent times when man believed that technology could build anything – not the least of which was a chess-playing robot.

Indeed, man has always been fascinated by robots – machines that do his work and often look like him. He is scarcely less intrigued by machines that seem to think like him (computers) and those machines that control themselves (automatons). Many are the basement inventors who have built machines that walk and talk like men, but these crude machines did not think or control themselves intelligently. It is in science fiction that the ultimate robots dwell. These sleek robots (often called androids) are computerized and thus have some ability to think. They are also autonomous, that is, they need not be controlled directly by man. The ultimate robot of fiction, superior in physical strength and mental capacity, runs the world for his human creators. In many wild tales these arrogant machines take over the planet (or the universe) completely.

Stimulating as science fiction is, it is not reality; the ultimate robot is a long way off. However, this fact should not dissuade us from building machines that can help man: machines that can take the place of men on the bottom of the sea, in dangerous coal mines, in minddulling industrial jobs, in all the dirty and dangerous tasks that still must be done by somebody or something.

Explosion of Star

The explosion of star is an awesome event. The most violent of these cataclysms, which produce supernovae, probably destroys a star completely. Within our galaxy of roughly 100 billion stars, the last supernova was observed in 1604. Much smaller explosions, however, occur quite frequently, giving rise to what astronomers call novae and dwarf novae. On the order of 25 novae occur in our galaxy every year, but only two or three are near enough to be observed. About 100 dwarf novae are known altogether. If the exploding star is in a nearby part of the galaxy, it may create a "new star" that was not previously visible to the naked eye. The last new star of this sort that could be observed clearly from the Northern Hemisphere appeared in 1946. In these smaller explosions the star loses only a minute fraction of its mass and survives to explode again.

Astrophysicists are fairly well satisfied that they can account for the explosions of supernovae. The novae and dwarf novae have presented more of a puzzle. From recent investigations that have provided important new information about these two classes of exploding star, the picture that emerges is quite astonishing. It appears that every dwarf nova – and perhaps every nova – is a member of a pair of stars. The two stars are so close together that they revolve around a point that lies barely outside the surface of the larger star. As a result the period of rotation is usually only a few hours, and their velocities range upward to within a two-hundredth of the speed of light.

Astronomers use the term "cataclysmic variable" to embrace the three general classes of

exploding star: dwarf novae, novae and supernovae. A cataclysmic variable is defined as a star that suddenly and unpredictably increases in brightness by a factor of at least 10. Dwarf novae are stars that increase in brightness by a factor of 10 to 100 within a period of several hours and decline to their former brightness in two or three days. In this period they emit some 10^{38} to 10^{39} ergs of energy. At maximum brilliance a dwarf nova shines about as intensely as our sun; while previously it had been only about a hundredth as bright. The number of outbursts ranges anywhere from three to 30 a year, but for any one star the intervals have a fairly constant value. Moreover, the maximum brightness from outburst to outburst is the same within a factor of two for a given star. The dwarf novae are often referred to, after their prototypes, as U Geminorum or SS Cygni stars. (The stars of each constellation are designated by letters or numbers.) A subgroup of dwarf novae, called Z Camelopardalis stars, do not always descend to minimum brightness between outbursts but may stay at some intermediate level for several months.

Black Hole

The theory of stellar evolution predicts that when the core of a star has used up its nuclear fuel, the core will collapse. If the star is about the size of the Sun, it will turn into a degenerate dwarf star. If it is somewhat larger, it may undergo a supernova explosion that leaves behind a neutron star. But if the stellar core has a mass greater than about three solar masses, gravitational forces overwhelm nuclear forces and the core collapses. Since nuclear forces are the strongest repulsive forces known, nothing can stop the continued collapse of the star. A black hole in space is formed.

Because of the intense gravitational forces near the black hole, nothing can escape from it, not even light. If we were to send a probe toward an isolated black hole, the probe would detect no radiation from the black hole. It would, however, sense a gravitational field like the one that would be produced by a normal star of the same mass. As the probe approached the black hole, the gravitational forces would increase inexorably. At a distance of a few thousand kilometers, the gravitational forces would be so great that the side of the probe closest to the black hole would literally be torn away from the side furthest away from the black hole. Eventually, at a distance of a few kilometers from the black hole, the particles that made up the probe would pass the point of no return, and the particles would be lost forever down the black hole. This point of no return is called the gravitational radius to the black hole.

But how can we hope to observe such an object? Nature, herself, could conceivably provide us with a "probe" of a black hole: a binary star system in which one of the stars has become a black hole and is absorbing the mass of its companion star. As the matter of the companion star fell into the black hole, it would accelerate. This increased energy of motion would be changed into heat energy. Near the gravitational radius the matter would move at speeds close to the speed of light, and temperatures would range from tens of millions of degrees to perhaps as much as a billion degrees. At these temperatures, X and gamma radiation are produced. Further, since the matter near the gravitational radius would be orbiting the black hole about once every

millisecond, the X-radiation should show erratic, short-term variability unlike the regular or periodic variability associated with neutron stars and degenerate dwarfs. The X-ray source *Cygnus X-1* fulfills these "experimental" conditions. It is part of a binary star system in which a blue supergiant star is orbiting an invisible companion star. This invisible companion has a mass greater than about nine times the mass of the Sun, and it is a strong X-ray source that shows rapid variations in the intensity of its X-ray flux. Most astronomers believe that Cygnus X-1 is a black hole; but this belief is tempered with a dose of caution. The idea of a black hole is still difficult to swallow, but theorists can think of no other object that could explain the phenomenon of Cygnus X-1. For this reason, in most scientific papers, Cygnus X-1 is referred to simply as a black hole "candidate".

Aston and Mass Spectrograph

Francis William Aston, British physicist and chemist, invented the mass spectrograph, which made possible the separation of heavier and lighter atoms and proved that almost all elements are composed of mixtures of various isotopes. He was born in Harborne, England, on September 1, 1877, and died in Cambridge on November 20, 1945.

A bright student who finished high school at the top of his class, Aston attended Malvern College and the University of Birmingham. His training was in chemistry, and in 1909 he became an assistant to J.J. Thomson at Cambridge University.

World War I interrupted the work that the two were conducting on neon gas and for four years Aston served in the British armed forces. Then he returned to Thomson's laboratory and redesigned Thomson's positive ray deflection apparatus into his own mass spectrograph. For his mass spectrograph and the knowledge he gained from it, he won the 1922 Nobel Prize in chemistry.

In the mass spectrograph the electric and magnetic fields were arranged so that all particles having the same mass were brought to a focus that produced a fine line on photographic film. Each line indicated the presence of atoms or molecules of a particular mass. With this apparatus Aston confirmed that two forms of neon existed with atomic masses of 20 and 22. From the comparative darkness of the lines he decided that the ions of the mass 20 were ten times as numerous as those of 22. If put together all the ions would have an average mass of 20.2, which was the actual atomic weight of neon.

Working on chlorine, Aston came to similar conclusions about its atomic weight. He formulated his whole number rule: Atomic weights of the isotopes of elements are very close to integers (whole numbers) if the mass of hydrogen is taken as one. The fractional atomic weights are due to the presence of two or more isotopes, or mixtures of different atoms of different integral weights in one element.

Aston continued to measure the exact masses of isotopes, and with a refined mass spectrograph was able to show that the atomic mass of individual isotopes on the atomic weight scale was slightly different from integers, sometimes just a little higher or lower, but these slight differences turned out to represent the energy that went into binding the component parts of the nuclei together.

Aston discovered 212 out of 287 naturally occurring isotopes. His work in measuring more precisely the exact masses of the isotopes was indispensable to progress in mid-20th century atomic research. Aston developed the mass spectrograph, which J. J. Thompson "invented", into a refined instrument capable of making accurate measurements of atomic masses.

Quantum Theory

Any successful theory in the physical sciences is expected to make accurate predictions. Given some well-defined experiment, the theory should correctly specify the outcome or should at least assign the correct probabilities to all the possible outcomes. From this point of view quantum mechanics must be judged highly successful. As the fundamental modern theory of atoms, of molecules, of elementary particles, of electromagnetic radiation and of the solid state it supplies methods for calculating the results of experiments in all these realms.

Apart from experimental confirmation, however, something more is generally demanded of a theory. It is expected not only to determine the results of an experiment but also to provide some understanding of the physical events that are presumed to underlie the observed results. In other words, the theory should not only give the position of a pointer on a dial but also explain why the pointer takes up that position. When one seeks information of this kind in the quantum theory, certain conceptual difficulties arise. For example, in quantum mechanics an elementary particles such as an electron is represented by the mathematical expression called a wave function, which often describes the electron as if it were smeared out over a large region of space.

This representation is not in conflict with experiment; on the contrary, the wave function yields an accurate estimate of the probability that the electron will be found in any given place. When the electron is actually detected, however, it is never smeared out but always has a definite position. Hence it is not entirely clear what physical interpretation should be given to the wave function or what picture of the electron one should keep in mind. Because of ambiguities such as this many physicists find it most sensible to regard quantum mechanics as merely a set of rules that prescribe the outcome of experiments. According to this view the quantum theory is concerned only with observable phenomena (the observed position of the pointer) and not with any underlying physical state (the real position of the electron).

It now turns out that even this renunciation is not entirely satisfactory. Even if quantum mechanics is considered to be no more than a set of rules, it is still in conflict with a view of the world many people would consider obvious or natural. This world view is based on three

assumptions or premises that must be accepted without proof. One is realism, the doctrine that regularities in observed phenomena are caused by some physical reality whose existence is independent of human observers. The second premise holds that inductive inference is a valid mode of reasoning and can be applied freely, so that legitimate conclusions can be drawn from consistent observations. The third premise is called Einstein separability or Einstein locality, and it states that no influence of any kind can propagate faster than the speed of light. The three premises, which are often assumed to have the status of well-established truths, or even self-evident truths, form the basis of what I shall call local realistic theories of nature. An argument derived from these premises leads to an explicit prediction for the results of a certain class of experiments in the physics of elementary particles. The rules of quantum mechanics can also be employed to calculate the results of these experiments. Significantly, the two predictions differ, and so either the local realistic theories or quantum mechanics must be wrong.

Comets

Comets occupy an especially interesting place within this framework. They may have been a source of part of the atmospheres of the terrestrial planets, and they are believed to have been the planetesimal-like building blocks for some of the outer planets and their satellites. Present knowledge places the origin of comets in the outer regions of the primitive solar nebula, both in and beyond the space now traversed by the giant planets (Jupiter, Saturn, Uranus, and Neptune). Perturbation of their original orbits, by the formation of these giant planets, is believed to have sent some protocometary bodies into the inner solar system (to collide with the Sun and inner planets – Mercury, Venus, Earth, and Mars) and others into orbits extending great distances from the Sun (up to 50,000 astronomical units (AU); 1AU = $150X10^6$ km, or the distance from the Sun to the Earth).

Comets consist of a nucleus, a coma, and a tail. According to a current model, comet nuclei contain simple and complex organic molecules, and meteorite – like dust and rock imbedded in a matrix of frozen water, possibly solid carbon dioxide and other ices. As comets approach the Sun, heating occurs and the ices vaporize, ejecting volatile "parent" compounds (possibly water, carbon dioxide, methane, acetylene, ammonia, hydrogen cyanide, etc.) and entraining nonvolatile dust and rock from the nucleus. In the coma that results, interactions of the gaseous parent compounds with solar radiation can lead to physical and chemical processes that cause the partial to complete breakdown of the so-called parent molecules to "daughter products". The uncharged daughter products are observed in the coma, whereas the positively charged ones are observed in the tail. According to an alternative view, all the observed daughter products already existed "frozen" in the nucleus of the comet, and were simply released directly into the coma by evaporation. In addition to the species, metallic elements (iron, silicon, magnesium, calcium, nickel, sodium, chromium) have been detected by means of spectroscopic analysis of comets that pass very close to the Sun, and of the meteor showers associated with comets. The relative abundances of these elements suggest similarities between the chemical compositions of cometary dust and carbonaceous meteorites.

Solar Cells

The need for solar electricity is clear. It is safe, ecologically sound, efficient, continuously available, and it has no moving parts. The basic problem with the use of solar photovoltaic devices is economics, but until recently very little progress had been made toward the development of low-cost photovoltaic devices. The larger part of research funding has been devoted to study of single-crystal silicon solar cells, despite the evidence, including that of the leading manufacturers of crystalline silicon, that the technique holds little promise. The reason for this pattern is understandable and historical. Crystalline silicon is the active element in the very successful semiconductor industry, and virtually all of the solid state devices contain silicon transistors and diodes. Crystalline silicon, however, is particularly unsuitable to terrestrial solar cells.

Crystalline silicon solar cells work well and are successfully used in the space program, where cost is not an issue. While single-crystal silicon has been proven in extraterrestrial use with efficiencies as high as 18 percent, and other more expensive and scarce materials such as gallium arsenide can have even higher efficiencies, costs must be reduced by a factor of more than 100 to make them practical for commercial use. Besides the fact that the starting crystalline silicon is expensive, 95 percent of it is wasted and does not appear in the final device. Recently, there have been some imaginative attempts to make polycrystalline and ribbon silicon, which are lower in cost than high-quality single crystals; but to date the efficiencies of these apparently lower-cost arrays have been unacceptably small. Moreover, these materials are cheaper only because of the introduction of disordering in crystalline semiconductors, and disorder degrades the efficiency of crystalline solar cells.

This dilemma can be avoided by preparing completely disordered or amorphous materials. Amorphous materials have disordered atomic structure as compared to crystalline materials: that is, they have only short-range order rather than the long-range periodicity of crystals. The advantages of amorphous solar cells are impressive. Whereas crystals can be grown as wafers about four inches in diameter, amorphous materials can be grown over large areas in a single process. Whereas crystalline silicon must be made 200 microns thick to absorb a sufficient amount of sun-light for efficient energy conversion, only 1 micron of the proper amorphous materials is necessary. Crystalline silicon solar cells cost in excess of $ 100 per square foot, but amorphous films can be created at a cost of about 50 per square foot.

Although many scientists were aware of the very low cost of amorphous solar cells, they felt that they could never be manufactured with the efficiencies necessary to contribute significantly to the demand for electric power. This was based on a misconception about the feature which determines efficiency. For example, it is not the conductivity of the materials in the dark which is relevant, but only the photoconductivity, that is, the conductivity in the presence of sunlight. Already, solar cells with efficiencies well above 6 percent have been developed using amorphous

materials, and further research will doubtless find even less costly amorphous materials with higher efficiencies.

Atmosphere

The atmosphere is mixture of several gases. There are about ten chemical elements which remain permanently in gaseous form in the atmosphere under all natural conditions. Of these permanent gases, oxygen makes up about 21 percent and nitrogen about 78 percent. Several other gases, such as argon, carbon dioxide, hydrogen, neon, krypton, and xenon, comprise the remaining 1 percent of the volume of dry air. The amount of water vapor, and its variations in amount and distribution, are of extraordinary importance in weather changes. Atmospheric gases hold in suspension great quantities of dust, pollen, smoke, and other impurities which are always present in considerable, but variable amounts.

The atmosphere has no definite upper limits but gradually thins until it becomes imperceptible. Until recently it was assumed that the air above the first few miles gradually grew thinner and colder at a constant rate. It was also assumed that upper air had little influence on weather changes. Recent studies of the upper atmosphere, currently being conducted by earth satellites and missile probings, have shown these assumptions to be incorrect. The atmosphere has three well-defined strata.

The layer of the air next to the earth, which extends upward for about 10 miles, is known as the *troposphere*. On the whole, it makes up about 75 percent of all the weight of the atmosphere. It is the warmest part of the atmosphere because most of the solar radiation is absorbed by the earth's surface, which warms the air immediately surrounding it. A steady decrease of temperature with increasing elevation is a most striking characteristic. The upper layers are colder because of their greater distance from the earth's surface and rapid radiation of heat into space. The temperatures within the troposphere decrease about 3.5 degrees per 1,000-foot increase in altitude. Within the troposphere, winds and air currents distribute heat and moisture. Strong winds, called jet streams, are located at the upper levels of the troposphere. These jet streams are both complex and widespread in occurrence. They normally show a waveshaped pattern and move from west to east at velocities of 150 mph, but velocities as high as 400 mph have been noted. The influences of changing locations and strengths of jet streams upon weather conditions and patterns are no doubt considerable. Current intensive research may eventually reveal their true significance.

Above the troposphere to a height of about 50 miles is a zone called the *stratosphere*. The stratosphere is separated from the troposphere by a zone of uniform temperatures called the tropopause. Within the lower portions of the stratosphere is a layer of ozone gases which filters out most of the ultraviolet rays from the sun. The ozone layer varies with air pressure. If this zone were not there, the full blast of the sun's ultraviolet light would burn our skins, blind our eyes, and eventually result in our destruction. Within the stratosphere, the temperature and atmospheric composition are relatively uniform.

The layer upward of about 50 miles is the most fascinating but the least known of these three strata. It is called the *ionosphere* because it consists of electrically charged particles called ions, thrown from the sun. The northern lights (*aurora borealis*) originate within this highly charged portion of the atmosphere. Its effect upon weather conditions, if any, is as yet unknown.

Light and Color

Much as an electrical lamp transforms electrical energy into heat and light, the visual "apparatus" of a human being acts as a transformer of light into sight. Light projected from a source or reflected by an object enters the cornea and lens of the eyeball. The energy is transmitted to the retina of the eye whose rods and cones are activated.

The stimuli are transferred by nerve cells to the optic nerve and then to the brain. Man is a binocular animal, and the impressions from his two eyes are translated into sight – a rapid, compound analysis of the shape, form, color, size, position, and motion of the things he sees.

Photometry is the science of measuring light. The illuminating engineer and designer employ photometric data constantly in their work. In all fields of application of light and lighting, they predicate their choice of equipment, lamps, wall finishes, colors of light and backgrounds, and other factors affecting the luminous and environmental pattern to be secured, in great part from data supplied originally by a photometric laboratory. Today, extensive tables and charts of photometric data are used widely, constituting the basis for many details of design.

Although the lighting designer may not be called upon to do the detailed work or making measurements or plotting data in the form of photometric curves and analyzing them, an understanding of the terms used and their derivation form valuable background knowledge.

The perception of color is a complex visual sensation, intimately related to light. The apparent color of an object depends primarily upon four factors: its ability to reflect various colors of light, the nature of the light by which it is seen, the color of its surroundings, and the characteristics and state of adaptation of the eye.

In most discussions of color, a distinction is made between white and colored objects. White is the color name most usually applied to a material that diffusely transmits a high percentage of all the hues of light. Colors that have no hue are termed neutral or achromatic colors. They include white, off-white, all shades of gray, down to black.

All colored objects selectively absorb certain wave-lengths of light and reflect or transmit others in varying degrees. Inorganic materials, chiefly metals such as copper and brass, reflect light from their surfaces. Hence we have the term "surface" or "metallic" colors, as contrasted with "body" or "pigment" colors. In the former, the light reflected from the surface is often tinted.

Most paints, on the other hand, have body or pigment colors. In these, light is reflected from the surface without much color change, but the body material absorbs some colors and reflects others; hence, the diffuse reflection from the body of the material is colored but often appears to be overlaid and diluted with a "white" reflection from the glossy surface of the paint film. In paints and enamels, the pigment particles, which are usually opaque, are suspended in a vehicle such as oil or plastic. The particles of a dye, on the other hand, are considerably finer and may be described as coloring matter in solution. The dye particles are more often transparent or translucent.

Organic Food

The words "organic", "chemicals", "natural", and "health" are among the most misunderstood, misused, and maligned in our vocabulary, especially when they are applied to our food.

All organic materials are complex combinations of chemicals and contain one chemical element in common. That element is carbon. But not all chemicals occur in the form of organic material. All of our usual food supply is in organic form because it has come from animal or plant sources. Most man-made foods are also in the organic form.

Today our chief concern about things organic and chemical relates to how foods are grown and processed. There are no precise, official definitions for these but some have been proposed for legal use and can be useful here:

"The term 'organically grown food' means food which has not been subjected to pesticides or artificial fertilizers and which has been grown in soil whose humus content has been increased by the addition of organic matter."

"The term 'organically processed food' means organically grown food which in its processing has not been treated with preservatives, hormones, antibiotics, or synthetic additives of any kind."

Organic material or humus used in growing the plants which we eat directly, or which are fed to the animals that furnish our meat, includes manure, plant composts, and other plant residues such as peat moss and aged sawdust.

These are all made by the living cells in animal or plant tissues. They contain the nutrients, nitrogen, phosphorous, potassium, sulfur, magnesium, and other essential minerals in complex combinations with carbon, hydrogen, and usually oxygen.

Inorganic or commercial fertilizers contain the same chemical nutrients but in simpler forms and not always in combination with carbon. It is not accurate to refer to inorganic fertilizers as "artificial" just because they have not been made by living cells.

A plant is not aware of the type of fertilizer, organic or inorganic, that is furnishing the chemicals for its growth. It does demand that these building blocks for its nutrients be in the inorganic form. Cells of the plant itself synthesize the complex materials needed for growth rather than absorbing them ready-made from the soil.

When organic fertilizers are used, they are first decomposed by the microorganisms in the soil. This converts nutrient materials to the inorganic form which can be used by the plant.

Organically raised animals are fed on organically grown pasture and feed. They are given no growth stimulants, antibiotics, or synthetic materials. But it is not likely that an animal's cells are aware of whether the many essentials for their growth and repair are being furnished by feed in the organic or inorganic form.

Jupiter

The magnetic field of Jupiter is approximately twenty to thirty times stronger than that of Earth. Because of its strength and great distance from the sun, Jupiter's magnetosphere is considerably larger than Earth's. If we could see the Jovian magnetosphere from Earth, it would appear close to the size of the moon in the sky, despite our great distance from Jupiter.

Jupiter's magnetosphere has three distinct regions. The inner region is doughnut-shaped, with the planet in the hole of the doughnut. It is similar to Earth's inner magnetosphere but more intense, containing several shells, where protons and electrons of enormous energies concentrate, as they do in Earth's Van Allen radiation belts. Jupiter's small innermost satellite, Amalthea, and three of its large satellites – Io, Europa, and Ganymede – travel through this inner region.

The middle region of the magnetosphere has no counterpart around Earth. It consists of a sheath of electrically charged particles being whirled around rapidly by the rotation of Jupiter's magnetic field. These particles strongly distort the intrinsic magnetic field of Jupiter.

The outer region is similar to the outer magnetosphere of Earth in that its shape is affected by interaction with the solar wind, a blizzard of electrons and protons that blows across space from the sun. The solar wind often forces the magnetic field of Jupiter back toward the planet, squeezing the magnetosphere as though it were a great air-filled bag. Leaks develop, from which high-energy particles "squirt" across the solar system. Some of these particles have been detected at Earth and at Mercury by orbiting and interplanetary spacecraft.

The energetic particles in the Jovian magnetosphere appear to have several sources. Some originate in the planet's ionosphere; others appear to be injected into the magnetosphere from the surface of the satellites. Io, in particular, is believed to interact with the Jovial magnetic field to produce energetic electrons, while volcanic activity on Io and the bombardment of Io's surface

with energetic particles are believed to be responsible for releasing sodium, potassium, and sulfur ions into the magnetosphere. These atoms and ions form neutral clouds around Io and a doughnut-shaped torus of ions circling Jupiter in the plane of the magnetic equator.

Investigations of this complex toric region of plasma, where gas is fully ionized, are important in understanding not only the magnetosphere of Earth but plasmas in general. Since most of the intensely energetic processes of the universe take place in plasmas, their study is important to future energy research, particularly in fusion power. The dynamic magnetosphere of Jupiter provides us with a unique laboratory for the study of these and other issues of astrophysics.

Sound Waves

Sound travels through the air in waves from a central source much as ripples from a pebble dropped into a pond travel across the surface of the pond, diminishing in intensity as they move away from the source. The speed at which sound waves travel in the air is affected by the air temperature, but for most purpose we can consider the speed of sound to be relatively constant at 1,100 feet per second. The distance between the peaks of the waves is the wavelength of the sound just as the distance between the ripples in the pond is the wavelength of the water. If we continue with the ripple-in-the-pond analogy and imagine a cork floating on the surface of the water, we can think of the frequency of sound waves as the number of times the cork bobs up and down during a given interval as the waves of water pass it.

The frequency is simply the speed of propagation of the wave divided by its wavelength. Therefore, if a sound is created at a given point, a system of spherical waves propagates from that point outward through the air at a speed of 1,100 feet per second, with the first wave making an ever-increasing sphere with time. On that sphere, the sound energy remains essentially constant in an ideal case. As the wave spreads, the height of the wave or the intensity of the sound at any given point must diminish as the fixed amount of energy is spread over the increasing surface area of the sphere. This phenomenon is known as the geometric attenuation of the sound. If we placed monitoring stations along the path of propagation of the sound, we would find that the intensity of the sound near the source would be much higher than the intensity of the sound at a great distance due to this phenomenon.

Mathematical relationships have been derived to describe this geometric attenuation, according to which for every doubling of distance the sound level will decrease by 6 decibels (dB). In other words, if station 1 were at a distance of 50 feet from the point source, and if station 2 were 100 feet from the point source, the sound level measured at station 2 would be 6 dB less than the sound level measured at station 1.

This kind of relationship holds true when the sound source is a single vehicle or an aircraft and when sound is propagating in free air, either from an airplane to the ground in completely spherical propagation or, in the case of an automobile on the ground, when the propagation field

is only half a sphere.

When a number of vehicles are lined up and constitute a continuous stream of noise sources, the situation is no longer characterized by a spherical or hemispherical spreading of the sound. Instead, the reinforcement by the line of point sources makes the propagation field more like a cylinder or half-cylinder. In this case, the decrease in sound for each doubling of the distance from the line source is only 3 decibels.

Baade

In 1943, astronomer Walter Baade obtained the first photographs of individual stars in the core of the spiral nebula in Andromeda. On the basis of these photographs, Baade proposed that stars could be classified into two groups on the basis of appearance and location.

The brightest members of what Baade termed "Population I" were hot, blue stars with surface temperatures of up to 30,000 degrees Kelvin and the brilliance of 100,000 suns. The brightest Population II stars were relatively cool and red, quite large, and fifty to 100 times fainter than Population I, with surface temperatures of only 3,000 to 4,000 degrees. Subsequent observations indicated that Population I stars occurred in the arms of Andromeda and other spiral galaxies, while Population II stars were most common between the arms, in the central regions of spiral galaxies, and in elliptical galaxies (which have no arms).

According to Baade, the two populations composed two distinct stellar age groups. Since the rate at which a star consumes its nuclear fuel is directly proportional to its luminosity or brightness, and luminosity increases very rapidly with an increase in mass, massive, bright stars burn much more quickly than small, dim stars. Baade thus proposed that the brightest and hottest Population I stars were probably very young, less than one million years old, while Population II stars were far older. This explained why Population I stars were found only in the spiral arms of galaxies, since these areas contain the interstellar gas and dust necessary for star formation.

Baade found support for this hypothesis in the distribution of so-called "red giants". It is believed that most of a star's hydrogen is consumed and converted to helium at its center. When the helium core comprises about one tenth of a star's mass, the star becomes unstable and expands, while its surface cools. It becomes a "red giant", a phase that may last many millions of years until the star consumes all the nuclear fuel in its center and disintegrates either in a single supernova explosion or in a series of nova outbursts. While Population I contains some red giants, most are found in Population II.

The chemical composition of red giants also supports Baade's conception. It is generally thought that all other elements gradually evolved from hydrogen as a result of nuclear reactions in stars. When a star undergoes an explosive death, it throws out the heavy elements it has produced. Thus the dust and gas out of which new stars are produced has gradually become richer in

heavier elements. Examination of the red giants in both populations has revealed that heavier elements such as calcium and iron are 100 times more abundant with respect to hydrogen in the Population I giants than they are in the Population II giants. Thus, Population II stars must have evolved out of material poor in heavier elements and can be presumed to be older.

While Baade's basic insight has been sustained, spectrographic analysis of stars in our own galaxy shows great variation in the concentration of heavy elements, so that the stars must be of assorted ages. Accordingly, in 1957 astronomers reclassified stars in five populations. Even these, however, are mainly a matter of convenience.

Extraterrestrial Intelligence

"A sad spectacle!" exclaimed Thomas Carlyle, contemplating the possibility that millions of planets circle other suns. "If they be inhabited, what a scope for pain and folly; and if they be not inhabited, what a waste of space!" Much more is now known about the universe than in Carlyle's time, but the question of whether ETI (a fashionable new acronym for Extraterrestrial Intelligence) exists is as open as it ever was. However, one incredible new fact has entered the picture. For the first time in history we have the technology for maybe answering the question. This mere possibility is so overwhelming in its implications that a new science called "exobiology" has already been named even though its entire subject matter may not exist.

We do know that our Milky Way galaxy contains more than 200 billion suns, and that there are billions of other galaxies. Are there other planets? Fifty years ago the two most popular theories about the origin of the solar system each made such planetary systems so unlikely that top astronomers believed that ours was the only one in the galaxy. After flaws were found in both theories, astronomers returned to a model proposed by Immanuel Kant (later by Laplace) in which solar systems are so likely that most of the Milky Way's stars must have them. The wobblings of a few nearby suns suggest big planets close to them, but no one really knows.

If solar systems are plentiful, our galaxy could contain billions of planets earthlike enough to support carbon-based life. Biologists have a strong case for confining life to carbon compounds (silicon and boron are the next best bets), but no one has any notion of how earthlike a planet must be to permit carbon life to arise. Our two nearest neighbors, Venus and Mars, were probably formed the same time the earth was; yet their atmospheres are strikingly different from each other and from ours. Even if a planet goes through an early history exactly like our earth's, no one knows the probability that life on its surface can get started. If it does start, no one knows the probability that it will evolve anything as intelligent as a fish.

Our probes of Mars have been great disappointments in SETI (Search for ETI). I can still recall the tingling of my spine when as a boy I read on the first page of H.G. Wells' *War of the Worlds*:

Yet across the gulf of space, minds that are to our minds as ours are to those of the beasts that

perish, intellects vast and cool and unsympathetic, regarded this earth with envious eyes, and slowly and surely drew their plans against us.

Not even Wells guessed how quickly the Martians would vanish from science fiction.

Continental Drift

The coastlines on the two sides of the Atlantic Ocean present a notable parallelism: the easternmost region of Brazil, in Pernambuco, has a convexity that corresponds almost perfectly with the concavity of the African Gulf of Guinea, while the contours of the African coastline between Río de Oro and Liberia would, by the same approximation, match those of the Caribbean Sea.

Similar correspondences are also observed in many other regions of the Earth. This observation began to awaken scientific interest about sixty years ago, when Alfred Wegener, a professor at the University of Hamburg, used it as a basis for formulating a revolutionary theory in geological science. According to Wegener, there was originally only one continent or land mass, which he called Pangea. Inasmuch as continental masses are lighter than the base on which they rest, he reasoned, they must float on the substratum of igneous rock, known as sima, as ice floes float on the sea. Then why, he asked, might continents not be subject to drifting? The rotation of the globe and other forces, he thought, had caused the cracking and, finally, the breaking apart of the original Pangea, along an extensive line represented today by the longitudinal submerged mountain range in the center of the Atlantic. While Africa seems to have remained static, the Americas apparently drifted toward the west until they reached their present position after more than 100 million years. Although the phenomenon seems fantastic, accustomed as we are to the concept of the rigidity and immobility of the continents, on the basis of the distance that separates them it is possible to calculate that the continental drift would have been no greater than two inches per year.

Evolution of Caves

Helictites are curious twisted or spiraling cylinders or needles. They apparently develop when water seeps through the ceiling so slowly that slight chemical or physical changes can cause reorientation of the crystal structure of the calcite or gypsum. *Cave corals*, also formed by slowly seeping water, are small clusters of individual knobs.

Most cave passages contain deposits of material that have been washed into the cave. This material, known as *cave fill*, varies from sand and clay to stratified gravel. The pebbles in these deposits often are highly polished or frosted and sometimes are as large as 6 inches in diameter. Cave fills are particularly noteworthy because they contain materials that reflect a geologic

history and a record of past climates of the surrounding area.

Rock material produced by the collapse of the ceiling or walls of a cave is called *breakdown* and may range in size from plates and chips to massive blocks. Most breakdown present in caves today appears to have occurred thousands of years ago. It is generally associated with the early history of cave development.

Importance of Water

Ocean water plays an indispensable role in supporting life. The great ocean basins hold about 300 million cubic miles of water. From this vast amount, about 80,000 cubic miles of water are sucked into the atmosphere each year by evaporation and returned by precipitation and drainage to the ocean. More than 24,000 cubic miles of rain descend annually upon the continents. This vast amount is required to replenish the lakes and streams, springs and water tables on which all flora and fauna are dependent. Thus, the hydrosphere permits organic existence.

The hydrosphere has strange characteristics because water has properties unlike those of any other liquid. One anomaly is that water upon freezing expands by about 9 percent, whereas most liquids contract on cooling. For this reason, ice floats on water bodies instead of sinking to the bottom. If the ice sank, the hydrosphere would soon be frozen solidly, except for a thin layer of surface melt water during the summer season. Thus, all aquatic life would be destroyed and the interchange of warm and cold currents, which moderates climate, would be notably absent.

Another outstanding characteristic of water is that water has a heat capacity which is the highest of all liquids and solids except ammonia. This characteristic enables the oceans to absorb and store vast quantities of heat, thereby often preventing climatic extremes. In addition, water dissolves more substances than any other liquid. It is this characteristic which helps make oceans a great storehouse for minerals which have been washed down from the continents. In several areas of the world these minerals are being commercially exploited. Solar evaporation of salt is widely practiced, potash is extracted from the Dead Sea, and magnesium is produced from sea water along the American Gulf Coast.

Harmful Effects of Radiation

Radiation occurs from three natural sources: radioactive material in the environment, such as in soil, rock, or building materials; cosmic rays; and substances in the human body, such as radioactive potassium in bone and radioactive carbon in tissues. These natural sources account for an exposure of about 100 millirems a year of the average American.

The largest single source of man-made radiation is medical X rays, yet most scientists agree that

hazards from this source are not as great as those from weapons test fallout, since strontium-90 and carbon-14 become incorporated into the body, hence delivering radiation for an entire lifetime. The issue is, however, by no means uncontroversial. The last two decades have witnessed intensified examination and dispute about the effects of low-level radiation, beginning with the United Nations Scientific Committee on the Effects of Atomic Radiation, which reported in 1958 that "even the smallest amounts of radiation are likely to cause deleterious genetic and perhaps also somatic effects".

A survey conducted in Britain confirmed that an abnormally high percentage of patients suffering from arthritis of the spine who had been treated with X rays contracted cancer. Another study revealed a high incidence of childhood cancer in cases where the mother had been given prenatal pelvic X rays. These studies have pointed to the need to reexamine the assumption that exposure to lowlinear energy transfer presents only a minor risk.

Recently, examination of the death certificates of former employees of a West Coast plant that produces plutonium for nuclear weapons revealed markedly higher rates for cancers of the pancreas, lung, bone marrow, and lymphatic system than would have been expected in a normal population.

While the National Academy of Sciences committee attributes this difference to chemical or other environmental causes rather than radiation, other scientists maintain that any radiation exposure, no matter how small, leads to an increase in cancer risk. It is believed by some that a dose of one rem, if sustained over many generations, would lead to an increase of 1 percent in the number of serious genetic defects at birth, a possible increase of 1,000 disorders per million births.

In the meantime, regulatory efforts have been disorganized, fragmented, inconsistent, and characterized by internecine strife and bureaucratic delays. A Senate report concluded that coordination of regulation among involved departments and agencies was not possible because of jurisdictional disputes and confusion. One federal agency has been unsuccessful in its efforts to obtain sufficient funding and manpower for the enforcement of existing radiation laws, and the chairperson of a panel especially created to develop a coordinated federal program has resigned.

Cloud-to-Ground Lightning

Cloud-to-ground lightning occurs when a discrepancy in electric charge develops between a cloud and the earth. When this discrepancy reaches a certain "breakdown potential", the surge of electric charge known as lightning rushes suddenly between the negative and positive charge centers. It is by preventing the requisite charge polarization that scientists hope someday to discourage the creation of cloud-to-ground lightning.

Many authorities theorize that the charging process occurs when a supercooled droplet of water

(a droplet whose temperature has fallen below 0℃ which has not yet frozen) collides with an ice particle of precipitation size (a hailstone). At the moment of contact a large portion of the droplet freezes, while a smaller portion, still in its supercooled state, dissociates itself. As a result of this interaction a negative charge is left on the hailstone and a positive charge on the supercooled droplet. The relatively heavy hailstone, responding to gravity, then falls, while the extremely light supercooled droplet is carried by updrafts to higher regions of the cloud. Assuming the veracity of this account of charge separation, scientists guess that they would be able to discourage polarization by reducing the quantity of supercooled water in a cloud. To this purpose they have conducted preliminary seeding experiments, attempting to freeze excess water by dropping large quantities of dry ice and silver iodide into potential thunderclouds. The results of these experiments, however, are as yet inconclusive.

A differing account of the polarization process is offered by Bernard Vonnegut and Charles B. Moore, who contend that the primary cause of electrical charge formation in clouds is the capture of ionized (electrically charged) gas molecules by water droplets. The ions, so the theory goes, are absorbed by the droplets and transported by updrafts and downdrafts to various portions of the cloud. Vonnegut and Moore suggest that, in order to combat the effects of this transport of ions, it would be necessary to modify the properties of ions beneath accumulating clouds. In support of this explanation of cloud polarization they conducted a series of "space charge" experiments.

Suspending a high-voltage wire above nine miles of Illinois countryside; they released large quantities of ions into atmosphere below forming clouds. By means of airplanes specially equipped for electrical measurements, they determined that the ions were being distributed to differing regions of the clouds.

Scientific Breakthroughs in Tandem

It is notorious that breakthroughs in science often come in tandem: the same, or almost the same, theoretical advance is made simultaneously by two or more investigators. Watson and Crick "raced" Linus Pauling to verify the helical structure of DNA; Darwin and Alfred Wallace announced the essentials of evolutionary theory simultaneously in 1858. Why should this occur? Why – to take another example – should Newton and Leibniz have worked out the differential calculus independently and in isolation from one another, when they were not even working on the same sorts of problems?

Newton's work on the calculus stemmed from his interest in the physical problem of the measurement of continuously changing quantities. Take, for example, the problem of determining the velocity of a freely falling body at a given instant. The body is constantly accelerating due to gravity. An approximate velocity at any time may be found by measuring the distance traveled over a very brief time interval such as a hundredth of a second; if one reduces the time interval measured until it approaches zero, the approximate velocity over the interval

approaches the actual velocity at any instant as a limit. Newton's genius was to grasp how to calculate such a change over an infinitesimal time period through a mathematical operation known as differentiation.

For various reasons, Newton delayed publishing a clear account of his calculus for nearly forty years. In the meantime, Leibniz approached the calculus from a completely different standpoint, that of the formal geometric problem of determining the tangent to a curve (and later, for the integral calculus, the area under a curve). This geometric problem was mathematically equivalent to Newton's consideration of bodies in motion, however, since the changing position of such a body over time can be plotted graphically as a curve in which the tangent to the curve at any point represents the velocity of the body at a given instant. Thus, Leibniz's formal geometric approach duplicated Newton's results.

This phenomenon of simultaneous discovery is surprising only to a public that views such breakthroughs as solitary acts of genius. In reality, Newton and Leibniz's ground had been thoroughly prepared in advance. In the century before Newton's birth, Europe had seen an explosion of scientific inquiry. Copernicus, Kepler, and others had formulated the laws of planetary motion and celestial mechanics. More specifically, when he began his mathematical work, Newton was already familiar with Descartes' coordinate geometry, the mathematics of infinitesimal intervals recently developed by John Wallis, and the method of finding tangents through differentiation worked out by Isaac Barrow. Thus, both the scientific problems and the conceptual tools that stimulated and facilitated Newton's astonishingly rapid development of the differential calculus were already the common property of science. Given Newton's delay in publishing his work, an independent discovery of the calculus by some other genius became not only possible but likely.

Birth of the Universe (Big Bang Theory)

At a particular moment roughly 15 billion years ago, all the matter and energy we can observe, concentrated in a region smaller than a dime, began to expand and cool at an incredibly rapid rate. By the time the temperature had dropped to 100 million times that of the sun's core, the forces of nature assumed their present properties, and the elementary particles known as quarks roamed freely in a sea of energy. When the universe had expanded an additional 1,000 times, all the matter we can measure filled a region the size of the solar system.

At that time, the free quarks became confined in neutrons and protons. After the universe had grown by another factor of 1,000, protons and neutrons combined to form atomic nuclei, including most of the helium and deuterium present today. All of this occurred within the first minute of the expansion. Conditions were still too hot, however, for atomic nuclei to capture electrons. Neutral atoms appeared in abundance only after the expansion had continued for 300,000 years and the universe was 1,000 times smaller than it is now. The neutral atoms then began to coalesce into gas clouds, which later evolved into stars. By the time the universe had

expanded to one-fifth its present size, the stars had formed groups recognizable as young galaxies.

When the universe was half its present size, nuclear reactions in stars had produced most of the heavy elements from which terrestrial planets were made. Our solar system is relatively young: It formed five billion years ago, when the universe was two thirds its present size. Over time the formation of stars has consumed the supply of gas in galaxies, and hence the population of stars is waning. Fifteen billion years from now stars like our sun will be relatively rare, making the universe a far less hospitable place for observers like us.

Our understanding of the genesis and evolution of the universe is one of the great achievements of 20th-century science. This knowledge comes from decades of innovative experiments and theories. Modern telescopes on the ground and in space detect the light from galaxies billions of light years away, showing us what the universe looked like when it was young. Particle accelerators probe the basic physics of the high-energy environment of the early universe. Satellites detect the cosmic background radiation left over from the early stage of expansion, providing an image of the universe on the largest scales we can observe.

Our best efforts to explain this wealth of data are embodied in a theory known as the standard cosmological model or the big bang cosmology. The major claim of the theory is that in the large scale average the universe is expanding in a nearly homogeneous way from a dense early state. At present, there are no fundamental challenges to the big bang theory, although there are certainly unresolved issues within the theory itself. Astronomers are not sure, for example, how the galaxies were formed, but there is no reason to think the process did not occur within the framework of the big bang. Indeed, the predictions of the theory have survived all tests to date.

Statistics

Nearly two thousand years have passed since a census decreed by Caesar Augustus became part of the greatest story ever told. Many things have changed in the intervening years. The hotel industry worries more about overbuilding than overcrowding, and if they had to meet an unexpected influx, few inns would have a manger to accommodate the weary guests. Now it is the census taker that does the traveling in the fond hope that a highly mobile population will stay put long enough to get a good sampling. Methods of gathering, recording, and evaluating information have presumably been improved a great deal. And where then it was the modest purpose of Rome to obtain a simple head count as an adequate basis for levying taxes, now batteries of complicated statistical series furnished by governmental agencies and private organizations are eagerly scanned and interpreted by sages and seers to get a clue to future events. The Bible does not tell us how the Roman census takers made out, and as regards our more immediate concern, the reliability of present-day economic forecasting, there are considerable differences of opinion. They were aired at the celebration of the 125th anniversary of the American Statistical Association. There was the thought that business forecasting might well be

on its way from an art to a science, and some speakers talked about newfangled computers and high-falutin mathematical systems in terms of excitement and endearment which we, at least in our younger years when these things mattered, would have associated more readily with the description of a fair maiden. But others pointed to the deplorable record of highly esteemed forecasts and forecasters with a batting average below that of the Mets, and the president-elect of the Association cautioned that "high powered statistical methods are usually in order where the facts are crude and inadequate, the exact contrary of what crude and inadequate statisticians assume". We left his birthday party somewhere between hope and despair and with the conviction, not really newly acquired, that proper statistical methods applied to ascertainable facts have their merits in economic forecasting as long as neither forecaster nor public is deluded into mistaking the delineation of probabilities and trends for a prediction of certainties of mathematical exactitude.

第八部分　　环境、生态、地质、地理

Endrin Contamination

The source of endrin contamination in river could not have been the nearby sugar cane fields, because the biggest kills occurred in late autumn, and the fields were sprayed in the spring. Investigation revealed no Louisiana industries discharging insecticide wastes into the river. It was concluded that the endrin must have been carried into Louisiana by the river's current from the north.

The symptoms which affected the fish in the widespread kills were described by the scientists as sub-acute. It was proposed therefore that the fish were receiving small doses of endrin resulting from dilution over a long distance in the immense flow of the river. The investigation zeroed in, therefore, on a plant 500 miles up river in Memphis, Tennessee, which manufactured endrin.

The job of the investigative team was to collect information on the manufacture of endrin, and to obtain samples of the mud and water from the immediate vicinity of the plant. The United States Public Health Service team did not find themselves very welcome at the plant. The manager refused to answer any specific questions about endrin and its byproducts, tersely suggesting that the questioners read the patents for particulars about the manufacturing processes. Moreover, the company officials insisted upon selecting the sites from which the soil and water samples were to be taken. In short, the investigators were treated more like spies from an alien government than like officers of the United States Public Health Service.

Rocks

Rocks which have solidified directly from molten materials are called igneous rocks. Igneous rocks are commonly referred to as primary rocks because they are the original source of material found in sedimentaries and metamorphics. Igneous rocks compose the greater part of the earth's crust, but they are generally covered at the surface by a relatively thin layer of sedimentary or metamorphic rocks. Igneous rocks are distinguished by the following characteristics: (1) they contain no fossils; (2) they have no regular arrangement of layers; and (3) they are nearly always made up of crystals.

Sedimentary rocks are composed largely of minute fragments derived from the disintegration of existing rocks and in some instances from the remains of animals. As sediments are transported, individual fragments are assorted according to size. Distinct layers or such sediments as gravels, sand, and clay build up, as they are deposited by water and occasionally wind. These sediments vary in size with the material and the power of the eroding agent. Sedimentary materials are laid

down in layers called strata.

When sediments harden into sedimentary rocks, the names applied to them change to indicate the change in physical state. Thus, small stones and gravel cemented together are known as conglomerates; cemented sand becomes sandstone; and hardened clay becomes shale. In addition to these, other sedimentary rocks such as limestone frequently result from the deposition of dissolved material. The ingredient parts are normally precipitated by organic substances, such as shells of clams or hard skeletons of other marine life.

Both igneous and sedimentary rocks may be changed by pressure, heat, solution, or cementing action. When individual grains from existing rocks tend to deform and interlock, they are called metamorphic rocks. For example, granite, an igneous rock, may be metamorphosed into a gneiss or a schist. Limestone, a sedimentary rock, when subjected to heat and pressure may become marble, a metamorphic rock. Shale under pressure becomes slate.

Ocean Movement

The notion of a tranquil abyss had been so generally held that many investigators were initially reluctant to accept the evidence for strong currents and storms in the deep sea. The first argument for the existence of such currents came from theory. Cold water is denser than warm water, and models of ocean circulation showed that the sinking of cold water near the poles should generate strong, deep and steady currents flowing toward the Equator. Subsequent observations not only confirmed the presence of the deep currents but also disclosed the existence of eddies on the western side of ocean basins that can be some 300 times as energetic as the mean current. Photographs of the sea floor underlying the deep currents also revealed extensive graded beds indicative of the active transport of sediments. The final evidence for dynamic activity at great depths came from direct measurements of currents and sediments in the North Atlantic carried out in the HEBBLE program.

Before we describe the HEBBLE findings in some details let us briefly review the sources and sinks of deep-sea sediments and the forces that activate the global patterns of ocean circulation. The sediments that end up on the ocean floor are of two main types. One component is the detritus whose source is the weathering of rocks on continents and islands. This detritus, together with decaying vegetable matter from land plants, is carried by rivers to the edge of the continent and out onto the continental shelf, where it is picked up by marine currents. Once the detritus reaches the edge of the shelf it is carried to the base of the continental rise by gravitational processes. A significant amount of terrestrial material is also blown out to sea in subtropical regions by strong desert winds. Every year some 15 billion tons of continental material reaches the outlets of streams and rivers. Most of it is trapped there or on the continental shelves; only a few billion tons escapes into the deep sea.

The second major component arriving at the sea floor consists of the shells and skeletons of dead

microscopic organisms that flourish and die in the sunlit waters of the top 100 meters of the world's oceans. Such biological material contributes to the total inventory at the bottom about three billion tons per year. Rates of accumulation are governed by rates of biological productivity, which are controlled in part by surface currents. Where surface currents meet they are said to converge, and where they part they are said to diverge. Zones of divergence of major water masses allow nutrient-rich deeper water to "outcrop" at the sunlit zone where photosynthesis and the resulting fixation of organic carbon take place. Such belts of high productivity and high rates of accumulation are normally around the major oceanic fronts (such as the region around the Antarctic) and along the edges of major currents (such as the Gulf Stream off New England and the Kuroshio currents off Japan). Nutrient-rich water also outcrops in a zone along the Equator, where there is a divergence of two major, wind-driven gyres.

Ocean Topography

Of the 197 million square miles making up the surface of the globe, 71 percent is covered by the interconnecting bodies of marine water; the Pacific Ocean alone covers half the Earth and averages nearly 14,000 feet in depth. The *continents* – Eurasia, Africa, North America, South America, Australia, and Antarctica – are the portions of the *continental masses* rising above sea level. The submerged borders of the continental masses are the *continental shelves*, beyond which lie the deep-sea basins.

The oceans attain their greatest depths not in their central parts, but in certain elongated furrows, or long narrow troughs, called deeps. These profound troughs have a peripheral arrangement, notably around the borders of the Pacific and Indian oceans. The position of the deeps near the continental masses suggests that the deeps, like the highest mountains, are of recent origin, since otherwise they would have been filled with waste from the lands. This suggestion is strengthened by the fact that the deeps are frequently the sites of world-shaking earthquakes. For example, the "tidal wave" that in April, 1946, caused widespread destruction along Pacific coasts resulted from a strong earthquake on the floor of the Aleutian Deep.

The topography of the ocean floors is none too well known, since in great areas the available soundings are hundreds or even thousands of miles apart. However, the floor of the Atlantic is becoming fairly well known as a result of special surveys since 1920. A broad, well-defined ridge – the Mid-Atlantic ridge – runs north and south between Africa and the two Americas, and numerous other major irregularities diversify the Atlantic floor. Closely spaced soundings show that many parts of the oceanic floors are as rugged as mountainous regions of the continents. Use of the recently perfected method of echo sounding is rapidly enlarging our knowledge of submarine topography. During World War II great strides were made in mapping submarine surfaces, particularly in many parts of the vast Pacific basin.

The continents stand on the average 2870 feet – slightly more than half a mile – above sea level. North America averages 2300 feet; Europe averages only 1150 feet; and Asia, the highest of the

larger continental subdivisions, averages 3200 feet. The highest point on the globe, Mount Everest in the Himalayas, is 29,000 feet above the sea; and as the greatest known depth in the sea is over 35,000 feet, the maximum *relief* (that is, the difference in altitude between the lowest and highest points) exceeds 64,000 feet, or exceeds 12 miles. The continental masses and the deep-sea basins are relief features of the first order; the deeps, ridges, and volcanic cones that diversify the sea floor, as well as the plains, plateaus, and mountains of the continents, are relief features of the second order. The lands are unendingly subject to a complex of activities summarized in the term *erosion*, which first sculptures them in great detail and then tends to reduce them ultimately to sea level. The modeling of the landscape by weather, running water, and other agents is apparent to the keenly observant eye and causes thinking people to speculate on what must be the final result of the ceaseless wearing down of the lands. Long before there was a science of geology, Shakespeare wrote "the revolution of the times makes mountains level".

The Making of Mountains

The geological story of the Rocky Mountains is a long one, the details of which are lost in the passage of hundreds of millions of years. Some of the story has been put together by scientists from bits of scattered evidence that strongly indicates a certain chain of events, few of which can be proved to everyone's satisfaction. Most of the rocks in the Colorado region are crystalline and ancient. The gneiss and schist were, in part, once sediments formed in the seas – perhaps a billion years ago. These sediments were buried beneath thousands of feet of other sediments, cemented and hardened into layers of sedimentary rock, and later squeezed, crushed, and elevated by slow, ceaselessly working earth forces, which produced mountains. During this period, the sedimentary rocks were changed to harder metamorphic rocks, probably because of deep burial under tremendous pressure and considerable heat. Masses of molten rock welled up into these earlier deposits and hardened under the earth's surface. This later intrusive material is now exposed granite in many parts of the Rocky Mountains.

These ancient mountains were gradually worn away by wind, rain, and other agents of erosion, which must have attacked the surface of the earth as vigorously then as now. With the passage of millions of years, these mountains were gradually worn away until a new sea lapped over the land where mountains had been, and once again sediments were dropped in its bottom. This new invasion of the ocean affected the Colorado region during the many millions of years in which dinosaurs dominated the earth.

In response to little-understood rhythms of the earth's crust, which have lifted mountains ever so slowly at great intervals all over the world, the seas drained away as the crust rose again, and the rising land once more became subject to the ceaseless attack of erosion. This uplift – which began 60 million years ago – originated the system of mountain ranges and basins that today give Colorado its spectacular scenery and much of its climate. This great period of mountain-making is called the Laramide Revolution, from its early recognition in the Laramie Basin region of

Wyoming. This uplift continued intermittently for many millions of years, but eventually these rocks too will be stripped away by erosion, though this will require millions of years.

An unusual feature of the present landscape is the peneplain, or rolling, sometimes flattened character of many mountain summits. These peneplains appear to be all that is left of an old land surface that may once have been continuous far eastward over the area occupied today by the Great Plains. Their presence suggests that the range had been worn down by erosion to a fairly flat upland a few million years ago, then renewed uplifting occurred, and streams draining the highland gradually cut canyons two or three thousand feet into the elevated surface. These canyons were filled by glaciers at intervals during the ice age. The glaciers, moving under their own great weight gradually broadened, deepened, and straightened the twists and turns of the original river-cut valleys, and bit by bit scooped out cirques (or bowls) at the glacier sources, and at the lower altitudes the landscape is dotted with moraines.

Windmills Used in the United States

Since the mid-19th century, more than 6 million small windmills, of less than 1 hp each have been built and used in the United States to pump water, generate electricity, and perform similar functions. Over 150,000 are still in operation.

Types commonly used to pump water have metal fan-blades, 12 to 16 feet in diameter, that are mounted on a horizontal shaft and have a tail-vane to keep the rotor facing into the wind. The shaft is connected to a set of gears and a cam that move a connecting rod up and down. This, in turn, operates a pump at the bottom of the tower. A 12-foot diameter rotor this type develops about 1/6 hp in 15 mph wind and can pump about 35 gallons of water a minute to a height of about 25 feet.

Small windmills used to generate electricity usually have two or three propeller-type blades that are connected by a shaft and gear train to a.d.c. generator. They usually incorporate some type of energy storage system, often consisting of a bank of batteries.

Many water-pumping windmills are still in use in the western United States for watering stock on ranges in remote areas. However, most of the wind-powered electrical generators were displaced by centralized electric power after the Rural Electrification Administration was instrumental in providing cooperative utilities for most U.S. farms in the 1930s.

The largest operation wind-powered electric system that has been built to date was the Smith-Putnam machine. After a lengthy study in the 1930s, Palmer Putnam concluded that a large machine was required to minimize the cost of the electricity generated. With the assistance of the eminent Cal Tech aerodynamicist Theodore von Kármán, and various members of the MIT staff, he designed a large wind turbine to feed power into the existing electrical network of the Central Vermont Public Service Company. The S. Morgan Smith Company of York,

Pennsylvania, constructed and operated the plant in the early 1940s. The 2-bladed 175-foot diameter propeller-type rotor weighed 16 tons and operated at a rated speed of 28 rpm to produce 1.25 MW of a.c. power.

In March 1945, after intermittent operation over a period of several years, one of the blades broke off near the hub where a known weakness had previously been identified but had not been corrected because of wartime material shortages. A comprehensive economic study indicated that the plant, even if repaired, could not compete effectively, at that time, with conventional electrical generation plants, so the project was abandoned.

Killer Waves

These huge waves wreak terrific damage when they crash on the shores of distant lands or continents. Under a perfectly sunny sky and from an apparently calm sea, a wall of water may break twenty or thirty feet high over beaches and waterfronts, crushing houses and drowning unsuspecting residents and bathers in its path.

How are these waves formed? When a submarine earthquake occurs, it is likely to set up a tremendous amount of shock, disturbing the quiet waters of the deep ocean. This disturbance travels to the surface and forms a huge swell in the ocean many miles across. It rolls outward in all directions, and the water lowers in the center as another swell looms up. Thus, a series of concentric swells are formed similar to those made when a coin or small pebble is dropped into a basin of water. The big difference is in the size. Each of the concentric rings of basin water traveling out toward the edge is only about an inch across and less than a quarter of an inch high. The swell in the ocean are sometimes nearly a mile across and rise to several multiples of ten feet in height.

Many of us have heard about these waves, often referred to by their Japanese name of "tsunami". For ages they have been dreaded in the Pacific, as no shore has been free from them. An underwater earthquake in the Aleutian Islands could start a swell that would break along the shores and cause severe damage in the southern part of Chile in South America. These waves travel hundreds of miles an hour, and one can understand how they would crash as violent breakers when caused to drag in the shallow waters of a coast.

Nothing was done about tsunamis until after World War II. In 1947 a particularly bad submarine earthquake took place south of the Aleutian Islands. A few hours later, people bathing in the sun along the quiet shores of Hawaii were dashed to death and shore-line property became a mass of shambles because a series of monstrous, breaking swells crashed along the shore and drove far inland. Hundreds of lives were lost in this catastrophe, and millions upon millions of dollars' worth of damage was done.

Hawaii (at that time a territory) and other Pacific areas then asked the U.S. Coast and Geodetic

Survey to attempt to forecast these killer waves. With the blessing of the government, the Coast and Geodetic Survey initiated a program in 1948 known as the Seismic Seawave Warning System, using the earthquake-monitoring facilities of the agency, together with the world seismological data center, to locate submarine earthquakes as soon as they might occur. With this information they could then tell how severe a submarine earthquake was and could set up a tracking chart, with the center over the area of the earthquake, which would show by concentric time belts the rate of travel of the resulting wave. This system would indicate when and where, along the shores of the Pacific, the swells caused by the submarine earthquakes would strike.

The UTM System

The UTM grid location, or reference, of a point may easily be found if the point can be located on a map with UTM grid marks along its edges or with a UTM grid superimposed. USGS (United States Geographical Survey) quadrangles published since 1959, and many published before then, have these ticks, which are printed in blue. If no USGS map with UTM ticks exists for a location, then latitude, and longitude coordinates, or certain local grid coordinates, may be converted to UTM references by a mathematical formula. However, computer programs are necessary to perform such a task. It is always preferable to record locations initially in UTM terms rather than to use translated values.

The simplicity of the UTM grid method follows from certain assumptions, which do not seriously compromise the accuracy or precision of measurements made on the common types of USGS topographical maps. The primary assumption is that narrow sections of the earth's nearly spherical surface may be drawn on flat maps with little distortion. Larger sections, however, such as the contiguous United States, cannot be drawn on a single flat map without noticeable distortion.

In the UTM system, the earth is divided into 60 zones, running north and south, each six degrees wide. Mapping of flat sheets within one of these narrow zones is satisfactory for all but the most critical needs. Each zone is numbered, beginning with zone 1 at the 180th meridian near the International Date Line with zone numbers increasing to the east. Most of the United States is included in Zones 10 through 19. On a map, each zone is flattened, and a square grid is superimposed upon it. Any point in the zone may be referred to by citing its zone number, its distance in meters from the equator ("northing") and its distance in meters from a north-south reference ("easting"). These three figures – the zone number, easting, and northing – make up the complete UTM Grid Reference for any point and distinguish it from any point on earth.

Northings for points north of the equator are measured directly in meters, beginning with a value of zero at the equator and increasing to the north. To avoid negative northing values for points south of the equator, the equator is arbitrarily assigned a value of 10 million meters, and points are measured with decreasing, but positive, northing values heading southward. For clarity, a minus sign usually precedes northing figures for points south of the equator. The explanation

may seem complicated, but experience has shown that dealing with negative values for measurements and having to specify the direction of measurements from a reference line are more complex and less reliable. When actually working with maps, especially at the scales commonly used for locating historic sites, the UTM grid system becomes extremely clear and straightforward to use.

Exploitation of Arid Land

Desertification in the arid United States is flagrant. Groundwater supplies beneath vast stretches of land are dropping precipitously. Whole river systems have dried up; others are choked with sediment washed from denuded land. Hundreds of thousands of acres of previously irrigated cropland have been abandoned to wind or weeds. Several million acres of natural grassland are eroding at unnaturally high rates as a result of cultivation or overgrazing. All told, about 255 million acres of land are undergoing severe desertification.

Federal subsidies encourage the exploitation of arid land resources. Low-interest loans for irrigation and other water delivery systems encourage farmers, industry, and municipalities to mine groundwater. Federal disaster relief and commodity programs encourage arid-land farmers to plow up natural grassland to plant crops such as wheat and, especially, cotton. Federal grazing fees that are well below the free-market price encourage overgrazing of the commons. The market, too, provides powerful incentives to exploit arid land resources beyond their carrying capacity. When commodity prices are high relative to the farmer's or rancher's operating costs, the return on a production enhancing investment is invariably greater than the return on a conservation investment. And when commodity prices are relatively low, arid land ranchers and farmers often have to use all of their available financial resources to stay solvent.

The incentives to exploit arid land resources are greater today than ever. The government is now offering huge new subsidies to produce synfuel from coal or oil shale as well as alcohol fuel from crops. Moreover, commodity prices are on the rise; and they will provide farmers and agribusiness with powerful incentive to overexploit arid land resources. The existing federal government cost-share programs designed to help finance the conservation as soil, water, and vegetation are pale in comparison to such incentives.

In the final analysis, when viewed in the national perspective, the effects on agriculture are the most troublesome aspect of desertification in the United States, for it comes at a time when we are losing over a million acres of rain-watered crop and pasture land per year to "higher uses" – shopping centers, industrial parks, housing developments, and waste dumps – heedless of the economic need of the United States to export agricultural products or of the world's need for U.S. food and fiber. Today the arid West accounts for 20% of the nation's total agricultural output. If the United States is, as it appears, well on its way toward overdrawing the arid land resources, then the policy choice is simply to pay now for the appropriate remedies or pay far more later, when productive benefits from arid land resources have been both realized and largely

terminated.

Thermal Pollution and Solar Energy

At the present time, 98% of the world energy consumption comes from stored sources, such as fossil fuels or nuclear fuel. Only hydroelectric and wood energy represent completely renewable sources on ordinary time scales. Discovery of large additional fossil fuel reserves, solution of the nuclear safety and waste disposal problems, or the development of controlled thermonuclear fusion will provide only a short-term solution to the world's energy crisis. Within about 100 years, the thermal pollution resulting from our increased energy consumption will make solar energy a necessity at any cost.

Man's energy consumption is currently about one part in ten thousand that of the energy we receive from the sun. However, it is growing at a 5% rate, of which about 2% represents a population growth and 3% per capita energy increase. If this growth continues, within 100 years our energy consumption will be about 1 percent of the absorbed solar energy, enough to increase the average temperature of the earth by about one degree centigrade if stored energy continues to be our predominant source. This will be the point at which there will be significant effects in our climate, including the melting of the polar ice caps, a phenomenon that will raise the level of the oceans and flood parts of our major cities. There is positive feedback associated with this process, since the polar ice cap contributes to the partial reflectivity of the energy arriving from the sun: As the ice caps begin to melt, the reflectivity will decrease, thus heating the earth still further.

It is often stated that the growth rate will decline or that energy conservation measures will preclude any long-range problem. Instead, this only postpones the problem by a few years. Conservation by a factor of 2, together with a maintenance of the 5% growth rate, delays the problem by only 14 years. Reduction of the growth rate to 4% postpones the problem by only 25 years; in addition, the inequities in standards of living throughout the world will provide pressure toward an increase in growth rate, particularly if cheap energy is available. The problem of a changing climate will not be evident until perhaps 10 years, before it becomes critical due to the nature of an exponential growth rate together with the normal annual weather variations. This may be too short a period to circumvent the problem by converting to other energy sources, so advance planning is a necessity.

The only practical means of avoiding the problem of thermal pollution appears to be the use of solar energy. (Schemes to "air-condition" the earth do not appear to be feasible before the twenty-second century.) Using the solar energy before it is dissipated to heat does not increase the earth's energy balance. The cost of solar energy is extremely favorable now, particularly when compared to the cost of relocating many of our major cities.

Ocean's Motion

The ocean is constantly in motion – not just in the waves and tides that characterize its surface but in great currents that swirl between continents, moving (among other things) great quantities of heat from one part of the world to another. Beneath these surface currents are others, deeply hidden, that flow as often as not in an entirely different direction from the surface course.

These enormous "rivers" – quite unconstant, sometimes shifting, often branching and eddying in a manner that defies explanation an prediction – occasionally create disastrous results. One example is El Niño, the periodic catastrophe that plagues the west coast of South America. This coast normally is caressed by the cold, rich Humboldt Current. Usually the Humboldt hugs the shore and extends 200 to 300 miles out to sea. It is rich in life. It fosters the largest commercial fishery in the world and is the home of one of the mightiest game fish on record, the black marlin. The droppings of marine birds that feed from its waters are responsible for the fertilizer (guano) exports that undergird the Chilean, Peruvian, and Ecuadorian economies.

Every few years, however, the Humboldt disappears. It moves out from the shore or simply sinks, and a flow of warm, exhausted surface water known as El Niño takes its place. Simultaneously, torrential rains assault the coast. Fishes and birds die by the millions. Commercial fisheries are closed. The beaches reek with death. El Niño is a stark demonstration of man's dependence on the sea and why he must learn more about it.

There are other motions in the restless sea. The water masses are constantly "turning over" in a cycle that may take hundreds of years, yet is essential to bring oxygen down to the creatures of the deeps, and nutrients (fertilizers) up from the sea floor to the surface. Here the floating phytoplankton (the plants of the sea) build through photosynthesis the organic material that will start the nutrient cycle all over again. Enormous tonnages of these tiny sea plants, rather than being rooted in the soil, are separated from solid earth by up to several vertical miles of saltwater. Sometimes, too, there is a more rapid surge of deep water to the surface, a process known as upwelling.

Internal waves, far below the surface, develop between water masses that have different densities and between which there is relative motion. These waves are much like the wind-driven waves on the surface, though much bigger: Internal waves may have heights of 300 feet or more and be 6 miles or more in length.

Side Effect of Offshore Oil Drilling

There are other environmental problems connected with offshore oil besides oil pollution, many of them are a routine part of operations. In drilling an offshore well, operators customarily discard overboard their drill cuttings with some unseparated drilling mud (which is not actually mud but a combination of clay and chemicals). A typical 15,000-foot well usually produces more than 1,000 tons of drill cuttings. In addition, mineral salts, which may have distinctly harmful

effects on some forms of marine life, are released from geological formations and are regularly discharged after treatment in the course of production. Localized short-term impacts have been detected as a result of these discharges.

Routine discharges like these, together with chronic low-level oil leaks, present "considerable environmental risk", the Council on Environmental Quality concluded in its report on OCS oil and gas.

Digging channels for service ships and barges, building docks and other structures at the waterfront, and, to a lesser extent, laying pipeline cause another kind of environmental disruption. Instead of poisoning marine creatures, these activities tend to bury them, choke them, or cut off the light which is essential to their whole food chain. Most important, dredging and filling change drainage patterns of estuaries and wetlands and can lead to erosion or saltwater intrusion. Increased salinity of the water marshes and estuaries is usually damaging to the young fish, shellfish, and other organisms residing there. They may not be able to tolerate the higher salinity, or they may be decimated by invading predators with an affinity for saltier waters.

Dredging for oil development was responsible for about one-quarter of the loss of 500 square miles of Louisiana marsh in 30 years through 1972, according to studies made at Louisiana State University. From the air, the changes in Louisiana's wetlands from offshore oil activity are striking. For mile after mile in the vast coastal lowlands, the curving, free-form marshes are penetrated by geometrically straight channels – narrow ones for pipelines, broader ones for drill barges and rigs. Spoil from the dredging is piled in ridges on the channel banks, altering the natural drainage from dozens of winding streams. Altogether, the study concluded, dredging, filling, and channelization in the Gulf of Mexico may have caused more damage than pollution from oil.

Finally, the sheer physical numbers of drilling rigs, production platforms with their multiple wells, service ships, barges, and 10,000 miles of underwater pipeline present something of a hazard to navigation in the Gulf of Mexico. Ships coming through must keep to prescribe two-mile-wide fairways, and wells may not be drilled into the shipping lanes (though they may be drilled underneath, in the ocean floor, at a slant).

Variation in Speed of Currents

Tidal currents are the horizontal movements of water that accompany the rising and falling of the tide. The horizontal movement of the tidal currents and the vertical movement of the tide are intimately related parts of the same phenomenon brought about by the tide-producing forces of the sun and moon. Tidal currents, like the tides, are therefore periodic.

The velocity of the tidal current at any place varies from day to day. In part, this variation arises from changes in meteorological conditions; but in much larger part, it is of a periodic character

and is due to changes in the position of the moon relative to the earth and sun. The tidal current varies according to three main patterns, each related to a particular movement of the moon.

The most noticeable variation, as a rule, is that related to the moon's phase. At times of new and full moon, the current is swifter than usual and is called *spring current*. When the moon is in its first and third quarters, the current flow is less than usual; hence, the speed is less than average. The current at such times is called *neap current*.

The second type of variation in the velocity of the current is related to the moon's varying distance from the earth. In its movement around the earth, the moon describes an ellipse in a period of approximately 27 1/2 days. The earth is at one of the foci of this elliptical orbit. Hence, during this period, the moon is at one time nearest the earth, and at another time, farthest away. When it is nearest the earth, or in perigee, the speed of the current is greater than average, and the currents are called *perigean currents*. When the moon is farthest from the earth, the speed of the current is less than usual. These currents are called *apogean currents*.

The third periodic variation in the speed of the tidal current is that associated with the moon's changing declination. Since the moon moves in an orbit inclined to the plane of the earth's equator, its declination is constantly changing during the month. When it is on or close to the equator, daily current strengths do not differ much; at such times, morning and afternoon currents resemble each other. As the declination increases, differences between morning and afternoon currents become pronounced. At the times of the moon's maximum semimonthly declination, these differences are most marked. When the moon is on or close to the equator and the difference between morning and afternoon currents is small, the currents are known as *equatorial currents*. At the times of the moon's maximum semimonthly declination, when the differences between morning and afternoon currents are at a maximum, the currents are called *tropic currents*, since the moon is then near one of the tropics.

There are other variations in the speed of the currents, but the three discussed above are the most prominent. These three variations are exhibited the world over, but not to the same degree everywhere. In many regions, the variation from neap to spring tide is the principal variation; in other regions, the variation from apogee to perigee predominates; in still other regions, the variation from equatorial to tropic currents is predominant.

Energy Park

An assumption that underlies most discussions of electric facility siting is that the initial selection of a site is the responsibility of the utility concerned – subject to governmental review and approval only after the site has been chosen. This assumption must be changed so that site selection becomes a joint responsibility of the utilities and the appropriate governmental authorities from the outset. Siting decisions would be made in accordance with either of two strategies. The metropolitan strategy takes the existing distribution of population and supporting

facilities as given. An attempt is then made to choose between dispersed or concentrated siting and to locate generating facilities in accordance with some economic principle. For example, the economic objectives of least-cost construction and rapid start-up may be achieved, in part, by a metropolitan strategy that takes advantage of existing elements of social and physical infrastructure in the big cities. Under the frontier strategy, the energy park may be taken as an independent variable, subject to manipulation by policymakers as a means of achieving desired demographic or social goals, e.g., rural-town-city mix. Thus, population distribution is taken as a goal of national social policy, not as a given of a national energy policy. In the frontier strategy, the option of dispersed siting is irrelevant from the standpoint of community impact because there is no preexisting community of any size.

Traditionally, the resource endowment of a location – and especially its situation relative to the primary industry of the hinterland – had had a special importance in American history. In the early agricultural period, the most valued natural endowment was arable land with good climate and available water. America's oldest cities were mercantile outposts of such agricultural areas. Deepwater ports developed to serve the agricultural hinterlands, which produced staple commodities in demand on the world market. From the 1840's onward, the juxtaposition of coal, iron ore and markets afforded the impetus for manufacturing growth in the northeastern United States. The American manufacturing heartland developed westward to encompass Lake Superior iron ores, the Pennsylvania coalfields, and the Northeast's financial, entrepreneurial and manufacturing roles. Subsequent metropolitan growth has been organized around this national core.

Against the theory of urban development, it is essential to bear in mind the unprecedented dimensions of an energy park. The existing electric power plant at Four Corners in the southwest United States – the only human artifact visible to orbiting astronauts – generates only 4000 megawatts electricity. The smallest energy parks will concentrate five times the thermal energy represented by the Four Corners plants. An energy park, then, would seem every bit as formidable as the natural harbor conditions or coal deposits that underwrote the growth of the great cities of the past – with a crucial difference. The founders of past settlements could not choose the geographic locations of their natural advantages.

The frontier strategy implements the principle of man-made opportunity; and this helps explain why some environmentalists perceive the energy park idea as a threat to nature. But the problems of modern society, with or without energy parks, require ever more comprehensive planning. And energy parks are a means of advancing American social history rather than merely responding to power needs in an unplanned, ad hoc manner.

Environmental Pollution

It is indisputable that in order to fulfill its many functions, water should be clean and biologically valuable. The costs connected with the provision of biologically valuable water for food

production with the maintenance of sufficiently clean water, therefore, are primarily production costs. Purely "environmental" costs seem to be in this respect only costs connected with the safeguarding of cultural, recreational and sports functions which the water courses and reservoirs fulfill both in nature and in human settlements.

The pollution problems of the atmosphere resemble those of the water only partly. So far, the supply of air has not been deficient as was the case with water, and the dimensions of the air-shed are so vast that a number of people still hold the opinion that air need not be economized. However, scientific forecasts have shown that the time may be already approaching when clear and biologically valuable air will become problem No. 1.

Air being ubiquitous, people are particularly sensitive about any reduction in the quality of the atmosphere, the increased contents of dust and gaseous exhalations, and particularly about the presence of odors. The demand for purity of atmosphere, therefore, emanates much more from the population itself than from the specific sectors of the national economy affected by a polluted or even biologically aggressive atmosphere.

The household's share in atmospheric pollution is far bigger than that of industry which, in turn, further complicates the economic problems of atmospheric purity. Some countries have already collected positive experience with the reconstruction of whole urban sectors on the basis of new heating appliances based on the combustion of solid fossil fuels; estimates of the economic consequences of such measures have also been put forward.

In contrast to water, where the maintenance of purity would seem primarily to be related to the costs of production and transport, a far higher proportion of the costs of maintaining the purity of the atmosphere derives from environmental considerations. Industrial sources of gaseous and dust emissions are well known and classified; their location can be accurately identified, which makes them controllable. With the exception, perhaps, of the elimination of sulphur dioxide, technical means and technological processes exist which can be used for the elimination of all excessive impurities of the air from the various emissions.

Atmospheric pollution caused by the private property of individuals (their dwellings, automobiles, etc.) is difficult to control. Some sources such as motor vehicles are very mobile, and they are thus capable of polluting vast territories. In this particular case, the cost of anti-pollution measures will have to be borne, to a considerable extent, by individuals, whether in the form of direct costs or indirectly in the form of taxes, dues, surcharges, etc.

The problem of noise is a typical example of an environmental problem which cannot be solved only passively, i.e., merely by protective measures, but will require the adoption of active measures, i.e., direct interventions at the source. The costs of a complete protection against noise are so prohibitive as to make it unthinkable even in the economically most developed countries. At the same time it would not seem feasible, either economically or politically, to force the population to carry the costs of individual protection against noise, for example, by reinforcing the sound insulation of their homes. A solution of this problem probably cannot be found in the

near future.

Conquest of the Atlantic

The first and decisive step in the expansion of Europe overseas was the conquest of the Atlantic Ocean. That the nation to achieve this should be Portugal was the logical outcome of her geographical position and her history. Placed on the extreme margin of the old, classical Mediterranean world and facing the untraversed ocean, Portugal could adapt and develop the knowledge and experience of the past to meet the challenge of the unknown. Some centuries of navigating the coastal waters of Western Europe and Northern Africa had prepared Portuguese seamen to appreciate the problems which the Ocean presented and to apply and develop the methods necessary to overcome them. From the seamen of the Mediterranean, particularly those of Genoa and Venice, they had learned the organization and conduct of a mercantile marine, and from Jewish astronomers and Catalan mapmakers the rudiments of navigation. Largely excluded from a share in Mediterranean commerce at a time when her increasing and vigorous population was making heavy demands on her resources, Portugal turned southwards and westwards for opportunities of trade and commerce. At this moment of national destiny it was fortunate for her that in men of the calibre of Prince Henry, known as the Navigator, and King John II she found resolute and dedicated leaders.

The problems to be faced were new and complex. The conditions for navigation and commerce in the Mediterranean were relatively simple, compared with those in the western seas. The landlocked Mediterranean, tideless and with a climatic regime of regular and well-defined seasons, presented few obstacles to sailors who were the heirs of a great body of sea lore garnered from the experiences of many centuries. What hazards there were, in the form of sudden storms or dangerous coasts, were known and could be usually anticipated. Similarly the Mediterranean coasts, though they might be for long periods in the hands of dangerous rivals, were described in sailing directions or laid down on the portolan charts drawn by Venetian, Genoese and Catalan cartographers. Problems of determining positions at sea, which confronted the Portuguese, did not arise. Though the Mediterranean seamen by no means restricted themselves to coastal sailing, the latitudinal extent of the Mediterranean was not great, and voyages could be conducted from point to point on compass bearings; the ships were never so far from land as to make it necessary to fix their positions in latitude by astronomical observations. Having made a landfall on a bearing, they could determine their precise position from prominent landmarks, soundings or the nature of the sea bed, after reference to the sailing directions or charts.

By contrast, the pioneers of ocean navigation faced much greater difficulties. The western ocean which extended, according to the speculations of the cosmographers, through many degrees of latitude and longitude, was an unknown quantity, but certainly subjected to wide variations of weather and without known bounds. Those who first ventured out over its waters did so without benefit of sailing directions or traditional lore. As the Portuguese sailed southwards, they left

behind them the familiar constellations in the heavens by which they could determine direction and the hours of the night, and particularly the pole-star from which by a simple operation they could determine their latitude. Along the unknown coasts they were threatened by shallows, hidden banks, rocks and contrary winds and currents, with no knowledge of convenient shelter to ride out storms or of very necessary watering places. It is little wonder that these pioneers dreaded the thought of being forced on to a lee shore or of having to choose between these inshore dangers and the unrecorded perils of the open sea.

Venice Sinks

Man and nature were the culprits as Venice sank hopelessly – or so it seemed – into the 177 canals on which the city is built. While nature's work took ages, man's work was much quicker and more brutal. But now man is using his ingenuity to save what he had almost destroyed. The sinking has been arrested and Venice should start rising again, like an oceanic phoenix from the canals.

The saving of Venice is the problem of the Italian Government, of course, but Venice is also a concern for Europe. And it happened that in the second half of 1975 Italy was in the chair of the European Council of Ministers. But the EC as such has no program for the salvation of Venice. "The Community is not a cultural community," explained one Commission official. "There are some areas where it just does not have competence, the preservation of historical landmarks being one of them." So the efforts to save Venice have taken on a worldwide, rather than a Community-wide dimension.

Industrialization of the Porto Marghera area brought economic benefits to Venice, but it also raped the city as growing air and water pollution began to take their toll on the priceless works of art and architecture. The danger of the imminent disappearance of Venice's cultural heritage was first brought to public attention in November 1966 when tides rose over six feet to flood Venice's canals and squares. Since then, various national and international organizations have sought ways and means to halt the destruction of the "queen of the Adriatic", though no one program has proved wholly satisfactory.

The US "Save Venice" group and the British "Venice in Peril" committee were formed to raise money for the restoration of priceless works of art and monuments. In 1967 the United Nations Educational, Scientific and Cultural Organization (UNESCO) took on the task of helping to save Venice by setting up a joint international advisory committee with the Italian Government. Such distant lands as Pakistan, no stranger to aid programs itself, joined in the effort, giving UNESCO a gift of 10,000 postage stamps for "Venice in Peril". Even a group of famous cartoonists felt moved to draw attention to the fact that "Venice must be saved" and organized an exhibit in 1973, with the Council of Europe in Strasbourg, France, and this year a ballet festival drew people and funds to Venice.

Though Venice, the city of bridge-linked islands, was built in the fifth century, the land on which it was built has been sinking "naturally" for a billion years. Movements of the earth's crust have caused the very slow and gradual descent of the Po Valley. And nature's forces aren't easily countered. Each year, Venice has been sinking about one millimeter into the lagoon which holds this Adriatic jewel. To add to Venice's peril, the slow melting of the polar cap causes the level of the sea to rise another millimeter. If nothing is done to reverse nature's work, Venice is doomed to be another Atlantis, lost for ever beneath the murky sea.

Man's part in the sink-Venice movement has been for reasons mainly economic. For the last 400 years, the population of Venice has been drifting toward the mainland to escape the isolation and inconvenience of living on a series of islets. Between 1951 and 1971, Venice lost 63,000 inhabitants. To curtail this migration, new, artificial land areas, on the Dutch model, were added to the old Venice. Venice's original builders had not been far-sighted enough and set the ground level at only a few inches above what they expected to be the maximum tides. The combination of reclaimed land and Porto Marghera industrialization have "squeezed" the lagoon until its waters have no place to go but ... up.

As Porto Marghera grows as an industrial port, and more and deeper channels are added for larger ships, currents become faster and dikes make the ravaging tides even more violent. The "acqua alta" has always been a problem for Venice, but with increased industrialization, flooding has become more frequent, sometimes occurring 50 times a year. Added to the violent "scirocco" that blows up to 60 miles an hour, Venice is rendered all the more vulnerable.

Yet Venice is not crumbling. Despite the visible decay caused by repeated floods and despite pollution that peels the stucco off the palazzi and eats away at their bottom-most steps, the structures are solid. The Rialto Bridge still stands safely on its ancient foundations supported by 6000 piles.

And something has been done to stop the damage done by water. Indeed, one simple measure has proved to work miracles. The ban on pumping from the thousands of artesian wells in and around the city – an easy source of water, but also a folly that caused a further descent of 5 millimeters a year – has been so effective that Venice should rise an inch in the next twenty years.

Models of Metropolis

Early models of the geography of the metropolis were unicellular; that is, they assumed that the entire urban system would normally be dominated by a single central district, around which the various economic functions of the community would be focused. This central business district (CBD) is the source of so-called high-order goods and services, which can most efficiently be provided from a central location rather than from numerous widely dispersed locations. Thus, retailers of infrequently and irregularly purchased goods, such as fur coats, jewelry, and antique furniture, and specialized service outlets, such as theaters, advertising agencies, law firms, and

government agencies, will generally be found in the CBD. By contrast, less costly, more frequently demanded goods, such as groceries and housewares, and low-order services, such as shoe repair and hairdressing, are available at many small, widely scattered outlets throughout the metropolis.

Both the concentric-ring model of the metropolis, first developed in Chicago in the late nineteenth century, and the sector model, closely associated with the work of Homer Hoyt in the 1930's, make the CBD the focal point of the metropolis. The concentric-ring model assumes that the varying degrees of need for accessibility to the CBD of various kinds of economic entities will be the main determinant of their location. Thus, wholesale and manufacturing firms, which need easy accessibility to the specialized legal, financial, and governmental services provided in the CBD, will normally be located just outside the CBD itself. Residential areas occupy the outer rings of the model, with low-income groups residing in the relatively crowded older housing close to the business zone and high-income groups occupying the outermost ring, in the more spacious, newer residential areas built up through urban expansion.

Homer Hoyt's sector model is a modified version of the concentric-ring model. Recognizing the influence of early established patterns of geographic distribution on the later growth of the city, Hoyt developed the concept of directional inertia. According to Hoyt, custom and social pressures tend to perpetuate locational patterns within the city. Thus, if a particular part of the city (say, the east side) becomes a common residential area for higher income families, perhaps because of a particular topographical advantage such as a lake or other desirable feature, future expansion of the high income segment of the population is likely to proceed in the same direction. In our example, as the metropolis expands, a wedge-shaped sector would develop on the east side of the city in which the higher-income residences would be clustered. Lower-income residences, along with manufacturing facilities, would be confined, therefore, to the western margins of the CBD.

Although Hoyt's model undoubtedly represented an advance in sophistication over the simpler concentric-ring model, neither model fully accounts for the increasing importance of focal points other than the traditional CBD. Recent years have witnessed the establishment around older cities of secondary nuclei centered on suburban business districts. In other cases, particular kinds of goods, services, and manufacturing facilities have clustered in specialized centers away from the CBD, encouraging the development of particular housing patterns in the adjacent areas. A new multicellular model of metropolitan geography is needed to express these and other emerging trends of urban growth.

Small Sacrifices to Help the Environment

A recent Harris Survey revealed that a majority of Americans say the price of gasoline would have to go to $ 1.50 a gallon before they would cut back on the use of their automobiles for pleasure driving. The survey, conducted among 1,517 adults nationwide, also found that gasoline

prices would have to go to $ 1.85 per gallon before adults would cease to use their own cars to go to work and would turn to public transportation and car pooling.

In fact, the price of gasoline is presently going down rather than up. Major oil companies have announced plans to reduce wholesale prices by as much as eight cents a gallon. As a result, those drivers who insisted that only rising gasoline costs would cut their consumption will now probably begin to drive more rather than less. Already, according to the Highway Patrol, highways are becoming more crowded with cars carrying only one passenger, and with gas-guzzling recreational vehicles.

These results are interesting when one considers that we are presently at the height of the smog season. As most of us know by now, the majority of our smog problem is caused by exhaust emissions from cars. Yet how many of us have actually made an effort to drive less? In fact, how many of us have even made an effort to drive more slowly to help conserve gasoline? Unfortunately, the answer to both questions is: not very many. Even though we all are aware – or certainly should be by now – that there is a desperate need both to conserve fuel and to clean up our air, far too few of us are willing to make even a small sacrifice to help.

Recently, we read that a small group of botanists is busily attempting to develop a strain of pine tree that can resist the smog. It seems that as the smog has gotten worse each year it has taken an increasingly greater toll on the pines in mountain areas. Now the situation is becoming critical, either we develop a hardier tree or they will all die. It's sad to think that in a country which professes so much love for nature, and where so much natural beauty abounds, we have to develop a breed of "supertrees" which can cope with the polluted air we create.

The solution to our smog problem lies not in eliminating the steel industry's coke oven emissions, or any other industrial emissions, but in convincing the millions of people who traverse our freeways daily to try at least to drive less. Obviously, it's necessary to drive in order to get to and from work, but if each of us could at least reduce the pleasure driving a little, drive the speed limit, and have our automobile engines tuned regularly, the improvement would be immediately noticeable. If we make these small sacrifices we won't have to worry about eventually paying $ 1.85 per gallon for gasoline. The reduced consumption will keep prices low because there will be enough for everyone without having to increase prices to "force" us to use less.

Theory of Plate Tectonics

Since the 1950s, the hypothesis of continental drift (originally proposed by the meteorologist Alfred Wegener in 1915) has been refined into the theory of "plate tectonics", first elaborated by Canadian geologist J. Tuzo Wilson. This theory holds that the lithosphere (the rigid outer layer of the earth) consists of about seven major and numerous minor plates in which the continents are embedded. These plates move over an underlayer of semiplastic rock, the asthenosphere. This constant shifting of plates results in faulting and the uplifting of the earth's crust into folded

mountain chains. The precise cause of plate movement is unknown, though it is thought to be related to connective heat currents in the upper portion of the earth's mantle.

Plate tectonics, while more widely credited than its more rudimentary forerunner, has yet to achieve universal acceptance. Although the positions of earthquake lines and mountain chains support the theory, V. V. Beloussov in the Soviet Union and Sir Harold Jeffreys in Britain are just two of the many scientists who have raised serious objections to it. As yet, however, no competing hypothesis has shown enough explanatory power to seriously challenge it.

Specific Ecology

Any species participates in what biologists call a "specific ecology", a relationship to its environment described by measurement both of environmental factors affecting the species, and of the species' response to these factors. Environmental factors include such variables as amount of light and abundance of food; species responses typically include changes in the rates of birth, death, immigration, and emigration.

Since environmental stresses limit population growth, variations in environment correlate directly with variations in local species population density. The relationships between particular environmental stresses and specific modes of response are difficult to define and predict; however, the relationship between the various response modes and changes in population density is relatively simple. The rate of change in population density is equal to the immigration rate plus the birth rate, minus the death rate, minus the emigration rate. Introduction of iodine into an area populated by sea urchins, for example, might affect the birth rate and immigration rate negatively, and the death rate and emigration rate positively, shifting the rate of change of population density toward the negative.

Effects of Campfires on Soil

A key study has shown that the organic matter content of a soil can be altered to a depth of 10 cm or more by intense campfire heat. As much as 90 percent of the original organic matter may be oxidized in the top 1.3 cm of a soil. In the surface 10 cm, the loss of organic matter may reach 50 percent if the soil is dry and the temperature exceeds 250℃. The loss of organic matter reduces soil fertility and water-holding capacity and renders the soil more susceptible to compaction and erosion.

Sandy soils attain higher temperatures and retain heat longer than clayey soils under similar fuel, moisture, and weather conditions. From this standpoint, it is desirable to locate campgrounds in an area with loam or clay-loam soil. Sandy soils are less susceptible to compaction damage, however, and are more desirable for campgrounds from this standpoint.

A water-repellent layer can be created in a soil by the heat from the campfire. This condition was noted only in sandy soils where the temperature remained below 350℃ during the campfire burn. Campfires often produce temperatures above this level. By comparison, forest fires are a shorter-duration event, and soil temperatures produced are more likely to create water repellency-inducing conditions. The greater areal extent of forest fires makes them a more serious threat than campfires in terms of causing soil water repellence.

If the soil remained moist for the duration of the campfire, the increased heat capacity of the soil and heat of water vaporization kept the soil temperature below 100℃. At this temperature, little loss of organic matter occurred, and no water repellence was created. For areas where the soil remains very moist, campfires probably have little effect on the soil properties.

Study has shown that softwood fuels burn faster and produce less heat flow into the soil than do hardwood fuels under the same conditions. Elm and mesquite were the hottest burning and longest lasting fuels tested. In areas where some choice of fuels is available, the use of softwood fuels should be encouraged in an effort to minimize the effect of campfires on soil properties.

The effects of campfires on the soil in a campground can be lessened by restricting the fire site to the same area, even if permanent concrete fireplaces are not installed. In this manner, any harmful effects are restricted to a minimum area. If campfires are allowed to be located at random by the user, the harmful effects tend to be spread over a larger part of the campground. The placement of a stone fire ring in the chosen location is one way to accomplish the objective.

These data support the decision to install permanent fireplaces in many areas and to restrict the use of campfires elsewhere in the park. This eliminates the harmful effects of campfires on the soil and allows the campground to be located on sandy soil with low compatibility and good drainage.