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Английский язык для аспирантов: хрестоматия для чтения

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МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

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**САНКТ-ПЕТЕРБУРГСКАЯ ГОСУДАРСТВЕННАЯ
ХУДОЖЕСТВЕННО-ПРОМЫШЛЕННАЯ АКАДЕМИЯ
имени А. Л. Штиглица**

Кафедра гуманитарных и инженерных дисциплин

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Настоящее пособие по английскому языку предназначено для аспирантов художественно-промышленной академии. Книга содержит неадаптированные тексты по искусствоведческой, архитектурной и культурологической тематике. Тексты предназначены для чтения и перевода. Пособие предназначено для аспирантов, обучающихся по направлениям подготовки 50.06.01 Искусствоведение и 07.06.01 Архитектура.

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ОГЛАВЛЕНИЕ

Введение

Основная цель курса английского языка для аспирантов - подготовка высокообразованного специалиста, научного работника, владеющего иностранным языком как средством осуществления научной, профессиональной и творческой деятельности в иноязычной сфере, а также средством межкультурной коммуникации в сферах науки, культуры и быта страны изучаемого языка.

Изучение иностранного языка аспирантами имеет целью достижение ими практического владения языком, позволяющего использовать его в научно-исследовательской работе.

Данное пособие призвано помочь аспирантам в тренировке перевода научного текста и резюмирования его.

Работа с настоящим пособием способствует развитию основных навыков и умений перевода специальных научных текстов. Пособие может использоваться для самостоятельной работы, так и для работы под руководством преподавателя.

Кроме перевода текста, рекомендуется его дальнейшая проработка в виде дискуссии на занятии либо в виде письменного резюмирования текста. Для участия в дискуссии или резюмирования текста будет правильно использовать следующие фразы:

The article goes on to say that…

I'd like to speak about…

I'm going to speak about…

First of all, I'd like to tell you a few words about…

And now some words about…

It's necessary to say that…

It should be noted / said / stressed that…

I'd also like to add that…

I think…

To my mind…

As you know…

In conclusion I can say that…

In conclusion it should be said that…

In conclusion I'd like to say that…

Тексты для чтения

Part 1. Culture and Art

The Characteristics of Culture

Culture is a fundamental concept within the discipline of anthropology. E. B. Tylor, the first professional anthropologist, proposed a definition of culture that includes all of human experience:

Culture is that complex whole which includes knowledge, belief, arts, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.

This view suggests that culture includes tools, weapons, fire, agriculture, animal domestication, metallurgy, writing, the steam engine, glasses, airplanes, computers, penicillin, nuclear power, rock and roll, video games, designer jeans, religion, political systems, subsistence patterns, science, sports, and social organizations.

Thus culture includes all aspects of human activity, from the fine arts to popular entertainment, from everyday behavior to the development of sophisticated

technology. It contains the plans, rules, techniques, designs, and policies for living. Tylor was using the term *culture* as a general phenomenon for all of humanity that was different from our physical or biological characteristics. The fundamental aspect of culture recognized by anthropologists today is that it is distinct from our human biological characteristics or genetics.

This nineteenth-century definition of culture has some terminology that would not be acceptable to modern anthropologists. For example, it relies on the word *man* to refer to what we currently would refer to as *humanity*. In addition, nineteenth-century theorists such as Tylor tended to think of "culture" as equivalent to "civilization," which implicitly suggested that there was an increase, accumulation, or growth in "culture" and "civilization" as societies progressed and evolved. This is not the meaning of culture that contemporary anthropologists maintain. Cultures are not evolving in some simplistic manner from early civilizations to modern civilizations as the nineteenth-century anthropologists believed. As we will discuss, humans have had different languages, beliefs, values, dietary habits, and norms or "cultures" that are associated with various regions in the past as well as the present.

Notice that Tylor's definition includes the word *society*. In general terms, society refers to an organized group of animals within a specific territory. In particular, it refers to the patterns of relationships among the animals within that territory. Biologists often refer to certain types of insects, herd animals, and social animals such as monkeys and apes as living in societies.

In the past, anthropologists attempted to make a simple distinction between society and culture. **Society** was said to consist of the patterns of relationships among people within a specified territory, and culture was viewed as the byproducts of those relationships. This view of society as distinguishable from culture was derived from ethnographic studies of small-scale societies. In such societies, people within a specific territory were believed to share a common culture. However, contemporary anthropologists have found this notion of shared culture to be too simplisticand crude. For example, modern anthropologists conduct ethnographic research in complex

societies. Withinthese societies there are many distinctive groups that maintain different cultural traditions. Culture is not a uniform byproduct of society—within societies there are varieties of culture. Even in small-scale societies, the idea that all people share a collective "culture" is also too crude and simplistic.

This conception of shared culture often resulted in gross stereotypes of, and extreme generalizations about, groups of people and their behavior.

Many anthropologists adopt the hybrid term *sociocultural system*—a combination of the terms *society* (or *social*) and *culture*—to refer to what used to be called "society" and the byproduct "culture." Many anthropologists use the term *sociocultural system* as the basic conceptual framework for analyzing ethnographic research.

Culture is Learned

The unique capacity for culture in the human species depends upon learning. We do not inherit our culture through our genes in the way we inherit our physical characteristics. We obtain our culture through the process of enculturation. **Enculturation** is the process of social interaction through which people learn and acquire their culture.

Humans acquire their culture both consciously, through formal learning, and unconsciously, through informal interaction. Anthropologists distinguish among several types of learning. One type is known as **situational learning**, or trial-and-error learning, in which an organism adjusts its behavior on the basis of direct experience. The costs and risks of situational learning can be quite high. Imagine if you only based your decisions about food on trial and error—you might encounter a number of foods that are poisonous or inedible. It would be very risky. Fortunately, humans are capable of learning from one another.

Learning from one another is called **social learning**. It occurs when one organism observes another organism respond to a stimulus and then adds that

response to its own collection of behaviors. Thus, the organism need not have the direct experience; it can observe how others behave and then imitate or avoid those behaviors. Obviously, humans learn by observing classmates, teachers, parents, friends, and the media. Within social situations, children and adults can make inferences about what is observed and perceived. Other social animals also learn in this manner. For example, wolves learn hunting strategies by observing pack members. Similarly, chimpanzees observe other chimps fashioning twigs with which to hunt termites and then imitate those behaviors. Recently, some primatologists and anthropologists have suggested that nonhuman primates have "culture" based upon how they learn socially from one another and have variations of behavior from one group to another. However, it appears that nonhuman animals, including primates, do not intentionally or deliberately teach one another as humans do. In addition, these nonhuman primates do not appear to have a core aspect of what most anthropologists view as an important criteria for designating a "culture," and that is the ability to symbolize.

Symbols and Symbolic Learning

Humans do not engage in social learning only through direct observation. Instead, humans can learn about things that are not immediately observable by using symbols.

Symbolic learning is based on our linguistic capacity and ability to use and understand **symbols**, arbitrary meaningful units or models we use to represent reality. An example of the arbitrary aspects of symbolism would be the colors red, yellow, and green for traffic lights in the United States. Traffic lights could be other colors in different societies, but in the United States, they take this arbitrary form. Sounds such as "cat," "dog," "tree," "one," "two," and "three" in English are symbolic and arbitrary because, as we know, the sounds that symbolize those words in languages such as Chinese, Navajo, or Russian can be completely different. However, linguistic

anthropologists know that symbols do not just refer to items such as animals or numbers. Symbolic communication and language can be used to represent abstract ideas and values. Symbols are the conceptual devices that we use to communicate abstract ideas to one another. We communicate these symbols through language. For example, children can learn to distinguish and name coins such as pennies, nickels, and quarters, and to use this money as a symbolic medium of exchange. The symbols of money in the United States or other societies are embedded within a host of many other symbols. Symbols do not stand in isolation from one another; instead, they are interconnected within linguistic symbol systems that enable us to provide rules and meanings for objects, actions, and abstract thought processes. The linguistic capacity that we are born with gives us the unique ability to make and use symbolic distinctions.

Humans learn most of their behaviors and concepts through symbolic learning. We do not have to depend upon situational learning or observations of others to perceive and understand the world and one another. We have the uniquely human ability to abstract the essence of complex events and patterns, creating images through symbols, and bestowing meaning and making inferences about these meanings.

Through the ability to symbolize, humans can learn, create meanings, and infer from those meanings in order to transmit culture. Parents do not have to depend on demonstrations to teach children. As children mature, they can learn abstract rules and concepts involving symbolic communication. Through oral traditions and text, humans can transmit this information across vast distances and through time. Symbolic learning has almost infinite possibilities in terms of absorbing and using information in creative ways. Most of our learning as humans is based on this symbolic-learning process.

Symbols and Signs

Symbols are arbitrary units of meaning, in contrast to **signs**, which are directly associated with concrete physical items or activities. Many nonhuman animals can learn signs. For example, a dog can learn to associate the ringing of a bell (a physical activity) with drinking water. You can teach the dog to drink when you ring the bell. Hence, both humans and other animals can learn signs and apply them to different sorts of activities or to concrete items.

Symbols are different from signs in that they are not directly associated with any concrete item or physical activity; they are much more abstract. A symbol's meaning is not always obvious. However, many symbols are powerful and often trigger behaviors or emotional states.

For example, the designs and colors of the flags of different countries represent symbolic associations with abstract ideas and concepts. In some flags, the color red may symbolize blood; in others, it may symbolize revolution. In many countries, the desecration of the national flag, itself a symbol, is considered a crime. When the symbols associated with particular abstract ideas and concepts that are related to the national destiny of a society are violated, powerful emotions may be aroused. The ability to symbolize, to create symbols and bestow meaning on them, enhances our learning capacities as humans in comparison with other types of animals.

Anthropologist Leslie White maintained that the most distinctive feature of being human is the ability to create symbols:

It is impossible for a dog, horse, or even an ape, to have any understanding of the meaning of the sign of the cross to a Christian, or of the fact that black (white among the Chinese) is the color of mourning. No chimpanzee or laboratory rat can appreciate the difference between Holy water and distilled water, or grasp the meaning of Tuesday, 3, or sin.

Symbols and Culture

The human capacity for culture is based on our linguistic and cognitive ability

to symbolize. Culture is transmitted from generation to generation through symbolic learning and the ability to make inferences regarding our symbols and language.

Through the transmission of culture, we learn how to subsist, how to socialize, how to govern our society, and what gods to worship. Culture is the historical accumulation of symbolic knowledge that is shared by a society. This symbolic knowledge is transmitted through learning, and it can change rapidly from parents to children and from one generation to the next. Generally, however, people in societies go to great lengths to conserve their cultural and symbolic traditions. The persistence of cultural and symbolic traditions is as widespread as cultural change.

Culture is Shared

Culture consists of the shared practices and understandings within a society. To some degree, culture is based on shared meanings that are to some extent "public" and thus, beyond the mind of any individual. Some of this culture exists before the birth of an individual into the society, and it may continue (in some form) beyond the death of any particular individual. These publicly shared meanings provide designs or recipes for surviving and contributing to the society. On the other hand, culture is also within the minds of individuals. For example, we mentioned that children learn the symbolic meanings of the different coins and bills that constitute money. The children figure out the meanings of money by observing practices and learning the various symbols that are public. However, children are not just passive assimilators of that cultural knowledge. Cognitive anthropologists such as Roy D'Andrade and Naomi Quinn emphasize **schemas**, or cultural models that are internalized by individuals and have an influence on decision making and behavior. They emphasize how culture is acquired by and modeled as schemas within individual minds and can motivate, shape, and transform the symbols and meanings.

Contemporary anthropologists recognize that cultural understandings are not shared equally by all members of a society. Even in small-scale societies, culture is

shared differently by males and females or by young and old. Some individuals in these societies have a great deal of knowledge regarding agriculture, medical practices, or religious beliefs; those beliefs and that knowledge are not equally distributed. In our complex industrialized society, culture consists of a tremendous amount of information and knowledge regarding technology and other aspects of society. Different people learn different aspects of culture, such as repairing cars or television sets, understanding nuclear physics or federal tax regulations, or composing music. Hence, to some extent, culture varies from person to person, from subgroup to subgroup, from region to region, from age group to age group, and from gender to gender. Contemporary anthropologists also note how culture is "contested," referring to how people question and may fundamentally disagree and struggle over the specifics of culture. Yet despite this variation, some common cultural understandings allow members of society to adapt, to communicate, and to interact with one another.

Without some of these common understandings, a society could not exist. One recent anthropological understanding of culture is sometimes referred to as the epidemiological approach pioneered by Dan Sperber and his colleagues.

These anthropologists draw on the fields of cognitive science and cognitive psychology to discuss how culture propagates like a contagious disease from one person to another. Thus, religious beliefs, cooking recipes, folktales, and even scientific hypotheses are ideas or representations within the human mind that spread among people in a shared environment. Chains of communication propagate these beliefs or cultural representations within a population. As in the spread of a contagious disease, some representations take hold and are maintained in particular populations, while other beliefs or representations do not resonate with specific groups and become extinct. Also, some beliefs or representations spread and are retained more easily within a population because they are more easily acquired than other beliefs. For example, some folktales or religious narratives are easily maintained within a population in contrast to highly complex abstract mathematical

formulae and narratives based on the findings within science. This epidemiological approach to culture is widely used by cognitive anthropologists to study how culture is transmitted and retained within populations.

Aspects of Culture

Within a broad and refined understanding, contemporary anthropologists have tried to isolate the key elements that constitute culture. Two of the most basic aspects of culture are material and nonmaterial culture.

Material culture consists of the physical products of human society (ranging from weapons to clothing styles), whereas **nonmaterial culture** refers to the intangible products of human society (values, beliefs, and norms). The earliest traces of material culture are stone tools associated with early hominins. They consist of a collection of very simple choppers, scrapers, and flakes. Modern material culture consists of all the physical objects that a contemporary society produces or retains from the past, such as tools, streets, buildings, homes, toys, medicines, and automobiles. Cultural anthropologists investigate the material culture of the societies they study, and they also examine the relationship between the material culture and the nonmaterial culture: the values, beliefs, and norms that represent the patterned ways of thinking and acting within a society. Archaeologists, meanwhile, are primarily concerned with interpreting past societies by studying their material remains.

Values are the standards by which members of a society define what is good or bad, holy or unholy, beautiful or ugly. They are assumptions that are widely shared within the society. Values are a central aspect of the nonmaterial culture of a society and are important because they influence the behavior of the members of a society. The predominant values in the United States include individual achievement and success, efficiency, progress, material comfort, equality, freedom, science, rationality,

nationalism, and democracy, along with many other assumptions. Although these values might seem normal to Americans, they are not accepted values in all societies. For instance, just as American society tends to emphasize individualism and self-reliance, other societies, such as the Old Order Amish in the United States, instead stress cooperation and community interest.

Beliefs held by the members of a society are another aspect of nonmaterial culture. Beliefs are cultural conventions that concern true or false assumptions, including specific descriptions of the nature of the universe and humanity's place in it. Values are generalized notions of what is good and bad; beliefs are more specific and, in form at least, have more content. "Education is good" is a fundamental value in American society, whereas "Grading is the best way to evaluate students" is a belief that reflects assumptions about the most appropriate way to determine educational achievement.

Most people in a given society assume that their beliefs are rational and firmly grounded in common sense. However, some beliefs may not necessarily be scientifically accepted. For example, our intuitive and commonsense understandings may lead us to conclude that the Earth is flat and stationary. When we look around us, the plane of the Earth looks flat, and we do not feel as if the Earth is rotating around the Sun. Yet, our cognitive intuitions and commonsense beliefs about these notions are contradicted by the knowledge gained by the scientific method.

Some anthropologists in the past have referred to the worldview of a particular society. A *worldview* was believed to consist of various beliefs about the nature of reality that provided a people with a more or less consistent orientation toward the world. Worldviews were viewed as guides to help people interpret and understand the reality surrounding them. Early anthropologists believed, for example, that the worldviews of the traditional Azande of East Africa and the traditional Navajos of the southwestern region of the United States included meaningful beliefs about witches. In these societies, witchcraft was believed to cause illnesses in some unfortunate

individuals. On the other hand, in societies such as that of Canada, medical doctors diagnosed illnesses using the scientific method and believed illnesses were caused by viruses, bacteria, or other material forces. These early anthropologists maintained that such differing beliefs about illness reflected the different worldviews of these societies. However, modern anthropologists remain very skeptical about these notions of worldviews shared by entire cultures.

This notion suggested that cultures were very homogeneous. Presently, anthropologists concur that the concept of a people sharing a worldview is highly questionable. Through systematic ethnographic research with different types of people within a society, contemporary anthropologists discover a great deal of variation in cultural beliefs. In particular circumstances in a society, some beliefs may be combined into an ideology. An **ideology** consists of cultural symbols and beliefs that reflect and support the interests of specific groups within society. Certain groups promote ideologies for their own ends as a means of maintaining and justifying economic and political authority. Different economic and political systems—including capitalism, socialism, communism, democracy, and totalitarianism—are based on differing ideologies. For example, many political leaders in capitalist societies maintain the ideology that individuals should be rewarded monetarily based on their own self-interest. In contrast, leaders in socialist societies have adopted the ideology that the well-being of the community or society takes precedence over individual self-interest.

In some societies, especially complex ones with many different groups, an ideology may produce **cultural hegemony**, the ideological control by one dominant group over values, beliefs, and norms. For example, one dominant ethnic group may impose its cultural beliefs on subordinate groups. In the United States, the dominant ethnic group in the eighteenth and nineteenth centuries, white Anglo-Saxon Protestants, was able to impose its language, cultural beliefs, and practices on the Native Americans in U.S. society. In many areas of the world, minority groups often accept the ideologies of the economically and politically dominant groups through the

process of cultural hegemony.

Some anthropologists have noted that subordinate groups may accept the ideology of the dominant group even if it is to their disadvantage. For example, in the past some Native Americans or African-Americans accepted the belief that white Americans were superior because they appeared to have many more opportunities to acquire wealth and political power than they did. Thus, the ideological culture of the dominant group becomes the "taken-for-granted" natural order and reality of the minority groups. In other cases of cultural hegemony, subordinate groups begin to resist the ideological foundations of the dominant group. For example, anthropologist Lila Abu-Lughod studied how Bedouin women of the Arab world resisted the imposition of the male-dominated ideologies in Egypt (1990).

Norms—a society's rules of right and wrong behavior— are another aspect of nonmaterial culture. Norms are shared rules or guidelines that define how people "ought" to behave under certain circumstances. Norms are generally connected to the values, beliefs, and ideologies of a society. For example, we have seen that in U.S. culture, individualism is a basic value, reflected in the prevailing beliefs. It is not surprising, then, that U.S. society has many norms based upon the notion of individual initiative and responsibility. Individuals are admonished to work for their own self-interest and not to become a burden to their families or community. Older Americans, if self-sufficient, are not supposed to live with their children. Likewise, self-sufficient young adults beyond a certain age should not live with their parents. These individualistic norms reflect the values of U.S. society and contrast with norms existing in other societies. In many agricultural societies, it would be considered immoral to allow aging parents to live outside the family. In these populations, the family is a moral community that should not be separated. Rather than individualism, these norms emphasize communal responsibility within the family unit.

Norms guiding ordinary usages and conventions of everyday life are known as

folkways. Members of a society frequently conform to folkways so readily that they are hardly aware these norms exist. For example, if a Chinese anthropologist were to ask an American why Americans eat with knives and forks, why Americans allow dating between single men and women without chaperones, or why American schoolchildren are not allowed to help one another on exams, he or she might get vague and uninformative answers, such as, "Because that's the way it is done," or, "It's the custom," or even, "I don't know." Cultural anthropologists are accustomed to receiving these kinds of answers from the members of the society they are studying. These folkway norms or standards of etiquette are so embedded in the society that they are not noticeable unless they are openly violated. Folkways help ensure that social life proceeds smoothly by providing guidelines for an individual's behavior and expectations of other people's behavior.

At the same time, folkways allow for some flexibility. Although most people conform to folkways most of the time, folkways are sometimes violated, but these violations are not severely punished. Thus, in U.S. society, people who eat with chopsticks rather than with knives and forks or who do not keep their lawns neatly mowed are not considered immoral or depraved, nor are they treated as criminals.

Mores are much stronger norms than are folkways. Members of society believe that their mores are crucial for the maintenance of a decent and orderly way of life. People who violate mores are usually severely punished, although punishment for the violation of mores varies from society to society. It may take the form of ostracism, vicious gossip, public ridicule, exile, loss of one's job, physical beating, imprisonment, commitment to a mental asylum, or even execution. For example, in some Islamic societies such as Iran and Saudi Arabia, the manner in which a woman dresses in public is considered morally significant. If a woman violates the dress code in these societies, she may be arrested by religious police and detained. Government and religious regulations control how Saudi women have to dress. They have to wear the *abaya* (a full black cloak), the *hijab* (head scarf), and the *niqab* (face veil). As we shall see later in the text, in hunting-and-gathering societies, individuals who do not

share goods or resources with others are often punished by gossip, ridicule, and occasionally ostracism. Not all norms can be neatly categorized as either folkways or mores. Distinguishing between the two is especially difficult when dealing with societies other than our own. In reality, norms fall at various points on a continuum, depending upon the particular circumstances and the society under consideration. The prohibition of public nudity may be a strong norm in some societies, but it may be only a folkway or pattern of etiquette in others. Even within a society, rules of etiquette may come to have moral significance. For example, as discussed before, the proper form of dress for women in some societies is not just a matter of etiquette, but has moral or religious connotations.

Values, beliefs, and norms are used by many social scientists when referring to nonmaterial culture. However, not all anthropologists agree that there are concise, clear-cut distinctions among these terms. The terms are used only to help us understand the complex symbolic aspects of nonmaterial culture.

Ideal versus Real Culture

When discussing values, beliefs, and norms, cultural anthropologists often distinguish between ideal culture and real culture. **Ideal culture** consists of what people say they do or should do, whereas **real culture** refers to their actual behaviors. Cultural anthropologists have discovered that the ideal culture frequently contrasts with people's actual behavior. For instance, a foreign anthropologist may learn that Americans cherish the value of equal opportunity, yet in observing Americans, the anthropologist might encounter many cases in which people from different economic, class, racial, ethnic, and religious backgrounds are treated in a highly unequal manner. Anthropologists often discover, however, that these kinship and descent principles are violated by the actual practices of people. Thus, in all societies, anthropologists find that there are differences between the ideal and real cultural practices of individuals.

Cultural Diversity

Throughout history, humans have expressed an interest in cultural diversity. People have recognized differences in values, norms, beliefs, and practices everywhere. Whenever different groups have come into contact with one another, people have compared and contrasted their respective cultural traditions. Societies often differentiated themselves from one another based on these variant cultural patterns. For example, one of the first Western historians, Herodotus, a Greek scholar of the fifth century b.c., wrote about the different forms of behavior and belief in societies, such as that of Egypt. He described how the Egyptians behaved and thought differently from the Greeks. Writings on the diversity of cultures have often been based on ethnocentric attitudes. *Ethnocentrism* is the practice of judging another society by the values and standards of one's own society. It appears that ethnocentrism is a universal phenomenon. As humans learn the basic values, beliefs, and norms of their society, they tend to think of their own group and culture as preferable, ranking other cultures as less desirable. In fact, members of a society become so committed to particular cultural traditions that they cannot conceive of any other way of life. They often view other cultural traditions as strange, alien, inferior, crazy, or immoral.

The study of cultural diversity became one of the principal objectives of anthropology as it developed as a profession in the nineteenth century. But like earlier writers, nineteenth-century anthropologists often reinforced ethnocentric beliefs about other societies. In the twentieth century, however, anthropologists began to recognize that ethnocentrism prevents them from viewing other cultures in a scientific manner.

To combat the problem of ethnocentrism, twentiethcentury anthropologists developed the concept of cultural relativism. **Cultural relativism** is the view that

cultural traditions must be understood within the context of a particular society's responses to problems and opportunities. Cultural relativism is a method or procedure for explaining and interpreting other people's cultures. Because cultural traditions represent unique adaptations and symbolic systems for different societies, these traditions must be understood by anthropologists as objectively as possible. In order to do an ethnographic study, anthropologists must suspend their own judgments and examine the other society in terms of its history and culture. Cultural relativism offers anthropologists a means of investigating other societies without imposing ethnocentric assumptions.

Cultural anthropologists attempt to understand the logic of the people they are studying. Perhaps that logic does not make sense from the anthropologists' perspective, but the task is to understand and explain the reasoning of the population studied.

Although cultural relativism provides a sound methodological basis for ethnographic research, it may involve some serious ethical problems. For example, many cultural anthropologists have found themselves in societies in which cultural practices may produce physical harm to people. How do cultural anthropologists refrain from making a value judgment about such harmful cultural practices as infanticide, child or spousal abuse, torture, or murder? This issue is an ever-present problem for anthropologists and deserves careful thought. Anthropologists do not argue that any practice or culture is as good or worthy as another. In fact, one of the major goals in anthropology is to improve conditions and enhance human rights for all people.

Food and Diversity

To understand the difference between human biological and cultural behaviors, we can simply observe the variety of ways in which different societies satisfy a basic biological drive such as hunger. Although humans are omnivorous animals with the

ability to digest many types of plants and animals for nutrition, there are many differences in eating behaviors and food preferences throughout the world. Food is not just a source of nutrition and oral pleasure. It becomes an aesthetic experience, a mechanism of sharing, a center of celebration, and sometimes a statement about one's own ethnic, religious, and cultural identity.

In general, American culture labels animals as either edible or inedible. Most Americans would be repulsed by the thought of eating insects and insect larvae, but many societies consider them to be delicacies. American culture also distinguishes between pets, which are not eaten, and farm animals, such as chickens, cows, and pigs, which can be eaten. In the United States, horses are considered pets or work animals, and there are no industries for raising them for human consumption. Yet, horsemeat is a regular part of the continental European diet. The French, Belgians, Dutch, Germans, Italians, Poles, and other Europeans consume significant quantities of horsemeat each year. Anthropologists explain differences in dietary preferences in various ways. For example, Mary Douglas offered an explanation of why the Jewish people have prohibitions against eating pork. She described this prohibition in her book *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo* (1966) by suggesting that all societies have symbolic classifications of certain objects or foods that are unclean, tabooed, polluted, or dirty, as well as those that are clean, pure, or undefiled. To illustrate her ideas regarding the classification of matter or foods, Douglas examined the ancient Israelites' classification of animals and taboos against eating certain animals such as pigs and shellfish, as described in Leviticus in the Bible. Douglas argues that like other humans, the ancient Israelites classified reality by placing things into distinct "mental boxes." However, some things do not fit neatly into discrete mental boxes. Some items are anomalous and ambiguous; thus they fall between the basic categories used to define cultural reality.

These anomalous items are usually treated as unclean, impure, unholy, polluting, or defiling. In explaining how these processes influenced the classification of animals among the ancient Israelites, Douglas alludes to the descriptions in the

first chapter of the Bible, Genesis, where God creates the animals with specific characteristics: Birds with feathers are soaring in the sky; fish with scales and fins are swimming in the water; and creatures with four feet are walking, hopping, or jumping on the land. However, some animals did not easily fit into the cultural categories used for the classification of animals. Animals that combined elements of different realms were considered ambiguous, and therefore unclean or unholy. For example, terrestrial animals that move by "swarming upon the earth," such as insects, were declared unclean and were prohibited from being eaten. Animals that have cloven hooves and chew cud, such as sheep, goats, and cattle, were considered clean and could be eaten. However, pigs have cloven hooves but do not chew cud and, therefore, failed to fit into the cultural classification of reality accepted by the ancient Israelites. Consequently, pigs were considered unclean and polluting, and were prohibited in the ancient Israelite diet. Shellfish and eels were also unclean animals because they swim in the water, but lack fins and scales. These anomalous creatures fell outside of the systematic classification of animals. Douglas maintains that the dietary laws of Leviticus represented an ideal construction of reality that represented God's plan of creation, which was based on perfection, order, and holiness. This became integral to the worldview of the ancient Israelites and affected their dietary preferences.

The late anthropologist Marvin Harris hypothesized that cultural dietary preferences frequently have an adaptive significance. In seeking the origins of the pig taboo, Harris emphasized, as did Douglas, that among the ancient Israelites, pigs were viewed as abominable animals not suited for human consumption. Yet, many societies show no aversion to the consumption of pork. Pigs have been a primary source of protein and fat throughout China and Europe. In some societies in the Pacific Islands, pigs are so highly regarded they are treated as members of the family (but they are also eaten). One medical explanation for the dietary prohibition is that the pig is an unclean animal and that it carries diseases such as trichinosis, which is caused by a type of tapeworm. Harris, however, considered these explanations to be unsatisfactory. Regarding cleanliness, Harris acknowledged that because pigs cannot

sweat, in hot, dry climates such as the Middle East, they wallow in their excrement to keep cool. He noted, however, that other animals, such as goats and chickens, can also be dirty, but they are eaten. Similarly, Harris emphasized that many other animals, such as cows, which are widely consumed, also carry diseases. Ultimately, Harris explained the origins of the pig taboo in Judaism (and later Islam) by analyzing the ecological conditions of the Middle East. He maintained that this dietary restriction represented a cultural innovation that helped the societies of this region to adapt. About 1200 b.c., the ancient Israelites had settled in a woodland area that had not been cultivated. As they rapidly cut down trees to convert areas to irrigated agricultural land, they also severely restricted areas suitable for raising pigs on natural forage. Eventually, pigs had to be fed grains as supplements, which made them extremely costly and direct competitors with humans. Moreover, they required artificial shade and moisture to keep cool. In addition, pigs were not useful for pulling plows, producing milk, or providing hides or wool for clothing.

According to Harris, despite the increasing costs associated with pig raising, people were still tempted to raise them for nutritional reasons. He hypothesized that the pig taboo was established to inhibit this practice through religious authorities and texts that redefined the pig as an unclean animal. Neighbors of the ancient Israelites, such as the Egyptians, began to share the abhorrence of the pig. The pig taboo was later incorporated into the Islamic religious text, the Qur'an, so that today both Muslims and Jews are forbidden to eat pork. Thus, according to Harris's hypothesis, in the hot, dry regions of the world where pigs are poorly adapted and extremely costly to raise, the meat of the pig came to be forbidden. He emphasized the practical considerations of pig raising, including the fact that they are hard to herd and are not grazing animals like goats, sheep, or cattle. In contrast, in the cooler, wetter areas of the world that are more appropriate for pig raising, such as China and New Guinea, pig taboos are unknown, and pigs are the prized foods in these regions. Both Douglas and Harris offer insights into the development of the dietary preferences of Jews and Christians. While Douglas explores the important symbolic significance of these

preferences, Harris examines the cost effectiveness and practical aspects of these food taboos.

Anthropologists such as Harris and others have been studying dietary diversity, such as why some people prohibit the eating of beef, whereas other people have adopted it as an integral aspect of their diet. Food preferences illustrate how humans the world over have universal needs for protein, carbohydrates, minerals, and vitamins but obtain these nutrients in different ways, depending upon the dietary preferences established within their culture. Anthropologists Sidney Mintz and Christine DuBois have summarized how other anthropologists have studied food and eating habits around the world and how these developments are associated with ecological conditions, technological requirements, biological factors, but also with patterns of identity, gender, class differences, and ritual and religious beliefs.

Anthropologists have continued to explore these numerous dimensions of food and eating habits in many different societies. For example, Daniel Fessler and C. D. Naverette looked at a broad cross-cultural sample of food taboos. They found that food taboos are overwhelmingly associated with meat and animal products compared with fruits or vegetables. Animal foods are viewed as much more dangerous than fruits and vegetables with respect to disease or death. The high cost of trial-anderror learning about which animal foods would be harmful would be counterproductive in any cultural tradition; thus, food taboos associated with animals tend to become more pervasive than prohibitions against fruits or vegetables. Research on the cultural aspects of food is an important arena for contemporary anthropological research.

Dress Codes and Symbolism

Although some cultural differences may relate to the environmental adaptations of societies emphasized by some anthropologists, much more of our cultural diversity is a consequence of symbolic creations. Symbols provide the basis of meaningful shared beliefs within a society. Because of our inherent cultural capacity, we tend to

be meaningseeking creatures. In addition to the satisfaction of biological needs, we have needs for meaning and significance in our personal and social lives.

The importance of symbols as a source of cultural diversity can be seen in the dress codes and hairstyles of different societies. In most situations, the symbolism of clothing and hairstyles communicates different messages, ranging from political beliefs to identification with specific ethnic or religious groups. The tartan of a Scottish clan, the black leather jacket and long hair of a motorcycle gang member in the United States, and the veil of an Islamic woman in Saudi Arabia all provide a symbolic vocabulary that creates cultural diversity.

Many examples of clothing styles can be used to illustrate how symbols contribute to cultural diversity. Consider, for instance, changing dress codes in the United States. During the 1960s, many young people wore jeans, sandals, and beads to symbolize their rebellion against what they conceived as the conformist inclinations of American society. By the 1980s, many of the same people were wearing three-piece “power suits” as they sought to advance up the corporate ladder. An example of how hairstyles can create meaningful symbolic codes can be seen in a group known as the Rastafarians (sometimes known as Rastas or Rastaman) of Jamaica. The majority of the people of Jamaica are of African descent. During the eighteenth and nineteenth centuries, they were brought to Jamaica by European slave traders to work on plantations. The Rastafarians are a specific religious group that believes Haile Selassie (1892–1975), the former emperor of Ethiopia whose original name was Ras Tafari, was the black Messiah who appeared in the flesh for the redemption of all blacks exiled in the world of white oppression. Rastafarian religion fuses Old Testament teachings, Christian mysticism, and Afro-Jamaican religious beliefs. The Rastafarian movement originated as a consequence of harsh economic, political, and living conditions in the slums of Jamaica.

In the 1950s, during the early phase of the Rastafarian movement, some male members began to grow their hair in “locks” or “dreadlocks” to symbolize their religious and political commitments. This hairstyle became well known in Western

society through reggae music and Rasta musicians such as the late Bob Marley. Rastafarians derive the symbolism of their dreadlock hairstyle from the Bible. They view the unshaven man as the natural man and invoke Samson as one of the most important figures in the Bible. Dreadlocks also reflect a dominant symbol within the Rastafarian movement—the lion. The lion is associated with Haile Selassie, one of whose titles was the "Conquering Lion of Judah." To simulate the spirit of the lion, some Rastas do not cut their hair, sometimes growing their locks 20 inches or more.

In addition, the dreadlock hairstyle has a deeper symbolic significance in Jamaican society, where hair was often referred to as an index of racial and social inequality. Fine, silky hair was considered "good," whereas woolly, kinky hair was frowned upon. The white person with fine, silky hair was considered higher on the social ladder than was the typical African descendant in Jamaica. Thus, the Rastafarian hairstyle is a defiant symbol of resistance to the cultural values and norms of Jamaican society.

Rastafarian dreadlocks and long beards symbolize savagery, wildness, danger, disorder, and degeneration. They send the message that Rastafarians are outside of Jamaican society. Many Jamaicans view the dreadlocks as unkempt, dangerous, and dirty, yet to the Rastafarians, dreadlocks symbolize power, liberation, and defiance. Through their hairstyle, they announce to society that they do not accept the values, beliefs, and norms of the majority of the people. Some young people in the United States have grown dreadlocks to symbolize their resistance to the dominant norms, beliefs, and values of the majority culture emphasizing capitalism and individual competition. Thus, to a great extent, culture consists of a network of symbolic codes that enhance values, beliefs, worldviews, norms, and ideologies within a society. Humans go to great lengths to create symbols that provide meaning for individuals and groups. These symbolic meanings are a powerful source of cultural diversity. When anthropologists study these symbolic codes and meanings, they often draw upon the humanistic-interpretive approach to comprehend these phenomena.

Ethnicity

One important aspect of culture is the recognition of one's own group as distinct from another, based on different values, beliefs, norms, and other characteristics. When referring to these differences, anthropologists use the terms *ethnic group* and *ethnicity*. **Ethnicity** is based upon perceived differences in ancestral origins or descent and upon shared historical and cultural heritage. An **ethnic group** is a collectivity of people who believe they share a common history, culture, or ancestry. For example, a small ethnic group known as the Old Order Amish maintains very strong ethnic boundary markers in U.S. society. Amish ethnicity originated in Switzerland during the sixteenth century. The Old Order Amish descended from a group of Anabaptists who split off with their own leadership during the Protestant Reformation. After this split, the Amish began to define themselves as different from other Anabaptists, Protestants, and Catholics, and they faced a great deal of persecution from the religious authorities. Eventually, the Amish fled to the United States in the 1700s, settling first in Lancaster, Pennsylvania.

From there, they have grown in number and live in 20 different states in the United States. Today, the Amish population is about 227,000 with about 50,000 in Ohio, 40,000 in Pennsylvania, and smaller numbers in 17 different states. There are no longer any Amish living in Europe. The Old Order Amish in the United States emphasize their ethnic difference through language by speaking a German dialect within their communities. The Amish dress in a traditional manner similar to that prescribed by the cultural codes of the 1600s. Men wear hats and have long beards; women have long hair, which is always covered by a hat in public. Based upon their interpretation of the Bible, the Amish strive to maintain a conservative, traditional way of life that forbids the adoption of modern technology such as electricity, automobiles, or television. They do not allow their children to be educated beyond the eighth grade so that they are not exposed to modern U.S. culture. The Amish have

an extremely emotional attachment to their ethnicity and culture. These sentiments are deeply rooted within Amish culture and are evident in their language, dress, and traditional style of life, which distinguishes them from other North Americans.

Cultural Universals

Early anthropologists emphasized the realities of cultural diversity in their research and writings. Some anthropologists, however, began to recognize that humans throughout the world share some fundamental behavioral characteristics.

George Murdock, an anthropologist who devoted himself to cross-cultural analysis, compiled a lengthy list of cultural universals from hundreds of societies. **Cultural universals** are essential behavioral characteristics of societies, and they are found all over the world. Murdock's list of cultural universals includes such basics as language, cooking, family, folklore, games, community organization, decorative art, education, ethics, mythology, food taboos, numerals, personal names, magic, religious rituals, puberty customs, toolmaking, and sexual restrictions. Although the specific content and practices of these universals may vary from society to society, the fact that these cultural universals exist underlies the essential reality that modern humans are of one biological family and one species.

In an influential book titled *Human Universals* (1991), anthropologist Donald E. Brown suggests that in their quest to describe cultural diversity, many anthropologists have overlooked basic similarities in human behavior and culture. This has led to stereotypes and distortions about people in other societies, who are viewed as "exotic," "inscrutable," and "alien."

Following in Murdock's footsteps, Brown describes many human universals. In one imaginative chapter, Brown creates a group of people he refers to as the "Universal People," who have all the traits of any people in any society throughout the world. The Universal People have language with complex grammar to communicate and think abstractly; kinship terms and categories to distinguish

relatives and age groupings; gender terms for male and female; facial expressions to show basic emotions; a concept of the self as subject and object; tools, shelter, and fire; patterns for childbirth and training; families and political groupings; conflict; etiquette; morality, religious beliefs, and worldviews; and dance, music, art, and other aesthetic standards. Brown's depiction of the Universal People clearly suggests that these and many other aspects of human behavior result from certain problems that threaten the physical and social survival of all societies. For a society to survive, it must have mechanisms to care for children, adapt to the physical environment, produce and distribute goods and services, maintain order, and provide explanations of the natural and social environments. In addition, many universal behaviors result from fundamental biological characteristics common to all people.

Anthropologists have discovered that culture can be both diverse and universal. The challenge for anthropology is to understand the basis of both this diversity and this universality. To paraphrase the late anthropologist Clyde Kluckhohn: Every human is like all other humans, some other humans, and no other human. The major objective of cultural anthropology is to investigate the validity of this statement.

Key National Symbols

Societies throughout the world have drawn upon important cultural symbols as a means of distinguishing their community from others. Some of these cultural symbols are secular or nonreligious in meaning, whereas others have religious connotations. Anthropologist Victor Turner (1967) described symbols as "multivocal," suggesting that they have multiple meanings for people within a society. He also said that symbols have the characteristic of "condensation," having the ability to unify many things and actions into a single formation.

National symbols such as flags have the potential for expressing deeply felt emotions in condensed forms. Flags, with their great public visibility, have been an extremely important symbolic medium of political communication throughout the

centuries. In U.S. society, the flag is a key secular symbol reflecting deeply felt community ties. The word swastika (*svastika*) is a Sanskrit word and ancient symbol of the earliest traditions of Hinduism and Buddhism; it is associated with "well-being" and "goodness." The swastika is used in many Hindu and Buddhist rituals and religious icons. However, the swastika was used as a symbol in the German flag during the Nazi regime (1933-1945) and has become stigmatized, as it is linked with anti-Semitism, violence, and hatred. The Nazi Party and Adolf Hitler selected the swastika as their symbol because it was linked as with the "Aryan race," the purported superior race of the ancient Indians and the Nordic race of northern Europe, including the Germans.

These racist notions regarding the Aryan race and Nordic race have been debunked by modern science. However, the swastika symbol is used by hate groups such as the Ku Klux Klan and neo-Nazi groups in the United States. The use of the swastika is outlawed in modern Germany.

Various religious symbols have produced fundamental meanings and metaphors for many countries throughout the world. For example, the symbols associated with the Virgin Mary in Roman Catholicism have developed into national symbols of unity for some countries. In Mexico, the symbolism associated with the Virgin of Guadalupe has served to unify different ethnic communities.

After Spain had colonized the indigenous Indian communities of Mexico beginning in the sixteenth century, many of the Indians, such as the Aztecs, were converted to Roman Catholicism. According to Mexican tradition, the Virgin Mary appeared before a hristianized Indian, Juan Diego, in 1531 in the form of a brown-skinned Indian woman. Tepeyac, the place where the apparition occurred, was the sacred site of an Aztec fertility goddess, Tonantzin, known as Our Lady Mother. Aztec cosmology contained many notions regarding the virgin births of deities. For example, Huitzilopochtli, the deity believed to have led the Aztecs to their home in Tenochtitlan, had been miraculously conceived by the Aztec mother goddess. Thus, Aztec religious beliefs regarding Tonantzin somewhat paralleled Catholic teachings

about Mary.

During the Virgin's appearance, Tonantzin commanded Juan Diego to inform the bishop of Mexico that a shrine should be built at the spot. The Shrine of the Virgin of Guadalupe is today a huge church, or basilica. Over the altar, Juan Diego's cloak hangs, embossed with the image of a young, dark-skinned woman wearing an open crown and flowing gown, standing on a half-moon that symbolizes the Immaculate Conception. The Virgin of Guadalupe became a potent symbol that has endured throughout generations, assuming different meanings for different social groups. To the Indians of Mexico, the Virgin embodies both Tonantzin and the newer Catholic beliefs and aspirations concerning eternal salvation. To the mestizos, people with mixed Spanish and Indian ancestry, she represents the supernatural mother who gave them a place in both the indigenous and the colonial worlds. To Mexicans in general, the Virgin represents the symbolic resolution of the many conflicts and problems that resulted from violent encounters between the Europeans and the local population. The Guadalupe shrine has become one of the most important pilgrimage sites in Mexico. In 2002, the late Pope John Paul II made a trip to Mexico to canonize Juan Diego as a saint in the Roman Catholic Church. The Vatican's recognition of this important hybrid religious figure helped reinforce the importance of this national symbol for Mexico. National symbols, whether religious or secular, have played extremely important roles in mobilizing people and countries in times of transition and struggle. These national symbols reflect the deep feelings that tie peoples together in what some scholars have referred to as "imagined communities". People share some basic key symbols with millions of people in an "imagined community" or nation regardless of whether they know one another as individual persons. Regardless of whether these communities are imagined or not, such symbols are key aspects of culture that are likely to be retained by societies worldwide in the twenty-first century.

Religion and Aesthetics

Archaeologists have discovered some limited evidence of religious beliefs and practices associated with archaic *Homo sapiens neanderthalensis*, or Neandertals, that date back to 100,000 years ago. Religion is a cultural universal, although specific beliefs and practices vary significantly from one society to another. For example, some religions are based on the worship of an all-knowing, all-powerful supreme being, whereas others have many deities, and some may have no deities at all. The term *religion* is derived from the Latin term *religio*, which has had different meanings in Western history. In some cases, it referred to a "transcendent" experience that individuals had beyond normal, everyday social life, but at other times, it referred to "superstition" or "piety". It has been extremely difficult for anthropologists to define religion with a simple formula because it varies so much from one region and culture to another .

Humans learn their religious traditions through the process of enculturation. Religious convictions are, therefore, shaped by the historical and social situations in which a person lives. For example, a person enculturated in ancient Greece would most likely have believed in many deities, among whom Zeus was the most powerful. In studying the anthropology of religion, a critical point must be understood: Anthropologists are not concerned with the "truth" or "falsity" of any particular religious belief. As anthropology is partially based on the scientific method, the field of anthropology is not competent or able to investigate supernatural or metaphysical questions that go beyond empirical data. Rather, anthropological research on religion focuses on the relationship of doctrines, beliefs, and other religious questions to aspects of cognition, emotions, and society. Most anthropologists recognize that religious faith is not a testable proposition that can be analyzed by science or logic. Faith is beyond empirical findings that can be uncovered by scientific investigation. The major questions posed by anthropologists are these: How do religious beliefs

become established within a society? How do religious beliefs affect, relate to, and reflect the cognitive, emotional, and sociocultural conditions and concerns of a group of people? In addition, anthropologists often use the humanistic interpretive approach when analyzing religious beliefs, symbols, and myths. Clifford Geertz offered a definition of religion to use as a tool in this humanistic-interpretive mode of understanding religion:

A religion is a system of symbols which acts to establish powerful, pervasive, and long-lasting moods and motivations in men by formulating conceptions of a general order of existence and clothing these conceptions with such an aura of factuality that the moods and motivations seem uniquely realistic.

Let us examine this definition more closely. Central to any religion is a "system of symbols," which includes all sacred objects, ranging from Christian crucifixes, Native American "medicine pouches," and Buddhist relics to sacred myths such as Genesis or the Ramayana of Hinduism. These symbols produce "moods," such as happiness and sadness, and "motivations" that provide direction or ethical goals in a person's life. Hence, religious symbols enhance particular feelings and dispositions, creating an intense 'sense of awe' in individuals. This awe is induced through the use of sacred symbols in rituals and other religious performances to create an atmosphere of mystery going beyond everyday experience. But religious symbols also create and reaffirm a worldview by "formulating conceptions of a general order of existence." This worldview provides meaning or purpose to life and the universe. A religious worldview helps people discern the meaning of pain and suffering in the world. Sacred myths help people make sense of the world and also explain and justify cultural values and social rules. One problem with Geertz's definition of religion is that it does not recognize the diversity of cultural beliefs, conceptions, and symbolic meanings and the multiplicity of practices and variation within any religious tradition. In other words, presently anthropologists are more aware that the concept of a homogeneous culture as used in the past is not useful in understanding different religions or civilizations. More recently, anthropologist David Parkin has

reconstructed Geertz's definition of religion and combined it with a more current anthropological understanding of emotions and cognition in his studies of Muslims in Zanzibar, East Africa (2007). Parkin suggests that Geertz's definition tended to separate emotions and cognition in categorical ways, but today anthropologists recognize that these two factors are inextricably combined. The ethnographic study of the Islamic tradition in Zanzibar by Parkin indicates that these people learn their religion through formal modes of cognition, but unconscious cognitive and emotional processes influence what they learn.

Myth and Ritual

The study of religious traditions includes the analysis and interpretation of myths. **Myths** consist of a people's assumed knowledge about the universe and the natural and supernatural worlds and about humanity's place in these worlds. All societies have such sacred myths. Anthropologists focus on a number of questions regarding myths: Why do myths of a particular type exist in different societies? What is the relationship between myths and other aspects of sociocultural systems? Are myths distortions of historical events? Or as Geertz suggested, do myths provide a blueprint for comprehending the natural and social world for a society? What are the functions of myths? How are myths interpreted and reinterpreted by different people within the society?

Rituals

The final portion of Geertz's definition—that these systems of symbols act to clothe those conceptions in "such an aura of factuality that the moods and motivations seem uniquely realistic"—attempts to deal with the question often asked about religious belief: How do humans come to believe in ideas about spirits, souls, revelations, and many unsupportable or untestable conceptions? Geertz's answer to

this question is that religious rituals in which humans participate create an "aura of factuality." It is through ritual that deeper realities are reached. Religion is nonempirical and nonrational in its search for truth.

It is not based on conclusions from scientific experience, but is "prior" to experience. Religious truth is not "inductive," providing evidence for metaphysical explanations. It symbolically and abstractly evokes the ultimate concerns of humans. Through ritual activities, these symbolic and abstract nonempirical truths are given meaning. Religious **rituals** consist of repetitive behaviors that communicate sacred symbols to members of society. Examples of religious rituals are the Catholic Mass, Jewish Passover rites, and Native American sweat lodge rites, which include prayer, meditation, and other spiritual communication. Anthropologist Edmund Leach (1966) emphasized that religious rituals communicate these sacred symbols and information in a condensed manner. He noted that the verbal part of a ritual is not separable from the behavioral part and that rituals can have different symbolic meanings for people in a society. In other words, religious rituals convey a unique, personal, psychological experience for every individual who participates. Recently, the anthropologist Harvey Whitehouse, using a cognitive-evolutionary approach, suggests that there are two different modes of religiosity: the doctrinal and the imagistic. The doctrinal mode is the formal scriptural or oral traditions that are associated with what children and adults learn from constant repetition within their religious tradition. In contrast, the imagistic mode is deeply emotional and results from an intense personal experience that an individual has with his or her religious tradition. In many cases, Whitehouse suggests, the imagistic mode of religiosity results from what he calls "flashbulb memories" from singular incidents that an individual has in ritual experiences. He did ethnographic research on traumatic puberty life cycle initiation rituals in Melanesia and describes how these rituals create flashbulb memories that result in an imagistic mode of religiosity for these males. These flashbulb memories highlight the "trauma" of these ritual experiences and induce images that remain with individuals throughout their lives. This distinction between doctrinal and imagistic modes of religiosity has

been an important means of understanding religious rituals for contemporary anthropologists.

Rites of Passage

Anthropologists have done considerable research on the **rites of passage**, rituals associated with the life cycle and the movement of people between different age-status levels. Almost all cultures have rites of passage to demarcate these different stages of the life cycle. Arnold Van Gennep (1960), a Belgian anthropologist, wrote a classic study of different rites of passage throughout the world. He noted similarities among various rites connected with birth, puberty, marriage, and funerals. According to Van Gennep, these rites of passage are characterized by three interconnected stages: *separation*, *marginality*, and *aggregration*.

The first phase, *separation*, transforms people from one age status to another. In this phase, people leave behind the symbols, roles, and norms associated with their former position. The second phase, referred to as *marginality*, places people in a state of transition or a temporary period of ambiguity. This stage often involves separating individuals from the larger society to undergo traditional ordeals or indoctrination. The final phase is *aggregation*, or incorporation, when individuals assume their new status. Later, the anthropologist Victor Turner refined the model of Van Gennep and referred to the three stages as *structure*, *antistructure* or *liminality*, and *communitas* (1969).

Structure is the initial status of the individual. The period of *liminality* is the temporary period of ambiguity, marginality, and antistructural. Turner defined *communitas*, as also part of the antistructural phase where the individual felt a strong bond and a sense of equality with others. The final phase of the rite of passage is reincorporation, marking a return to, and reunion with, society with a wholly new status.

The best-known examples of these rites of passage are various religious rituals associated with adolescence, such as the confirmation rituals associated with Catholicism and the *bar mitzvah* and *bat mitzvah* rituals in Judaism.

Religious Specialists

One important area of research in the anthropology of religion is the study of religious specialists in different societies. Every society has certain individuals who possess specialized sacred knowledge. Such individuals officiate over rituals and interpret myths. The type of religious specialist varies with the form of sociocultural system. **Shamans** are usually part-time religious practitioners who are believed to have contact with supernatural beings and powers. They do not have a formalized official status as religious practitioners in their respective societies. Shamans are involved in various types of healing activities, treating both physical and psychological illnesses. Aside from their religious functions, they participate in the same subsistence activities and functions as anyone else in their society. Anthropologists also use terms such as *native healer*, *medicine man*, and *medicine woman* to refer to these practitioners.

The terms **priest** and **priestess** refer to full-time religious specialists who serve in an official capacity as a custodian of sacred knowledge. In contrast to shamans, priests and priestesses are usually trained through formal educational processes to maintain religious traditions and rituals. Priests and priestesses are usually associated with more complex sociocultural systems.

Religious Movements

Another topic of interest in the anthropology of religion is the analysis of religious movements. In early approaches of the social sciences, religion was viewed simply as an outcome of certain economic or political conditions in society. It was

assumed that as society developed modern economic and political institutions, religious traditions would disappear. Religion was viewed as a peripheral element that served only to conserve society as a static system. Today, however, some anthropologists have begun to analyze religious beliefs and worldviews as major variables that induce societal change. For example, cultural anthropologists studying Islamic fundamentalist movements have concluded that, in the Middle East, religion is a major force for social change.

Cognition and Religion

A number of cognitive anthropologists such as Pascal Boyer, Scott Atran, Harvey Whitehouse, Stewart Guthrie, and Joseph Henrich, have drawn on these two fields in order to explore religion. In Boyer's *Religion Explained: The Evolutionary Origins of Religious Thought* (2001) and Atran's *In Gods We Trust: The Evolutionary Landscape of Religion* (2002), these anthropologists recognize the importance of the humanistic interpretive approach in understanding religion, but they also want to explore the scientific-causal aspects of religion and the universal aspects of religion everywhere.

These anthropologists investigate questions such as these: Why does religion matter so much in people's lives everywhere?

Are there any common features of religion? Why do certain types of religious beliefs develop, rather than other types? Drawing upon a vast range of cross-cultural data, these anthropologists suggest that evolution and natural selection have designed the human mind to be "religious." Although there is a tremendous diversity of religious traditions throughout the world, some types of religious beliefs have more resilience and are retained and culturally transmitted by humans more than others. In all societies, children are exposed to various religious beliefs and practices. But as Atran and Boyer emphasize, because of specific predispositions and intuitions within our evolutionary- designed mind, certain forms of religious beliefs and concepts have

exceptional relevance and meaning for humans.

In a related discussion regarding some of the most common features of religion, cognitive anthropologist Stewart Guthrie argues that human religious beliefs and concepts are based on the cognitive phenomena of anthropomorphism.

Anthropomorphism is the psychological disposition to project and perceive human characteristics in nonhuman phenomena. In his book *Faces in the Clouds: A New Theory of Religion*, Guthrie suggests that anthropomorphism is an inherent aspect of our cognitive and thinking processes (1993). As humans perceive the world, they tend to project human agency-like characteristics into the world. For example, when we look at clouds we tend to perceive human "faces in the cloud." Guthrie draws on worldwide ethnographic data to indicate many similar phenomena reported by people. When humans project these human agency-like characteristics in many cases they are attributed to unseen agents such as deities, spirits, or supernatural forces. Humans attribute agency to many types of nonhuman entities, including clouds, computers, wind, or other phenomena. Guthrie asserts that as we grapple with complex phenomena, our cognitive processes use our understanding of persons and humans to interpret these complex phenomena. These cognitive processes are unconscious, but they have consequences for the emergence of religious thinking in all humans.

In contrast to the intuitive knowledge and inferences that become a reliable basis for comprehending the natural and social world, both Atran and Boyer emphasize that religious beliefs and knowledge are mostly counterintuitive. Religious spirits and gods have properties that normal people do not have. Although most humans treat religious spirits and gods as persons, they are radically different from what our intuitions tell us about persons. For the most part, they do not eat, grow old, or die; they can even fly through space, become invisible, change shape, and perceive our innermost thoughts. Gods and spirits become invisible partners and friends of people, but these spiritual beings are unlike normal persons. These spiritual agents can be at several places at one time and have full access to our innermost thoughts

and specific behaviors and actions. Some societies have a concept of a god that knows everything. Adults and children at an early age understand that normal people do not have these capacities for knowledge. These counterintuitive abilities of spirits and gods, including their full access to our thoughts and specific behaviors, are "attention grabbing" for humans throughout the world. Spiritual agents who have this full access to knowledge become extremely relevant in understanding human social and moral conditions. Beings that can know our innermost thoughts and all of our behaviors resonate with our social and moral intuitions. Thus, religious beliefs and concepts become widespread and plausible in all societies because of the way human cognition is organized and designed. Beliefs in witches, ancestral spirits, and angry or beneficent gods become easily represented in all cultures because they are dependent on our human cognitive capacities and intuitive understanding of the natural and social worlds. These religious phenomena activate and trigger our human cognitive capacities and intuitive abilities, which results in the universal distribution of certain types of spiritual beliefs and concepts.

These cognitive anthropologists explain why religious beliefs have become so powerful throughout human prehistory and history. They do not suggest that there is a specialized area of the brain or "religious instinct" that is a religious center that handles god- or spiritual-related thoughts. In addition, they do not suggest that there are specific people who have exceptional religious abilities and were responsible for establishing religious beliefs and practices. Religion, like other everyday matters in our natural and social circumstances, does not require special capacities. Rather, religious beliefs and concepts become relevant to humans everywhere because they readily coincide with our cognitive capacities and our intuitive and inferential abilities. These beliefs and teachings are likely to have a direct effect on people's thoughts, emotions, and morality.

Additionally, many religious beliefs are different from our everyday common-sense beliefs and intuitions.

Religious beliefs have commonalities such as spiritual agents that have full

access to our innermost thoughts, concepts of life after death, and concepts of morality all over the world; most likely they have a long evolutionary history. Other religious beliefs may have developed in the past, but they did not have the sustaining power of the ones known today, and they disappeared. The religious beliefs that still exist have a central relevance to many people, are extremely powerful, and converge with their cognitive capacities and abilities. In some cases, people may give up their lives or kill others based on their particular religious beliefs. These cognitive anthropological explorations of the interconnection between human cognition and religious expression have contributed to anthropological hypotheses about our cognitive capacities and about links between biological and psychological developments and our religious life.

Recently, a number of cognitive anthropologists have combined the cognitive approach to religion described above with an understanding of how religious beliefs and rituals induce both cooperation within groups and enmity between different groups. Reciprocity and exchange through economics, kinship, and marriage maintain "prosocial" norms for altruistic cooperation in small-scale societies. However, how are prosocial norms for cooperation among people maintained in large-scale societies and interrelationships that are no longer based directly on reciprocity and kinship relations? Cognitive anthropologists suggest that as large-scale agricultural civilizations develop, major religious traditions and shared sacred values, beliefs, and rituals become the stabilizing prosocial norms for cooperation among people who no longer share kinship connections. Building large-scale monuments (e.g., temples and pyramids) involved increasing commitments of labor to sustain particular religious beliefs and sacred values. These activities were costly to the individuals.

The people who did not participate in these costly projects tended to be punished by other members of their societies. Thus, most people tended to cooperate and participate, regardless of cost. These shared initiatives produced cooperation and collective action among people of different family and socioeconomic backgrounds.

However, as these complex religious traditions and sacred values that reinforced group solidarity and cooperation, economic and demographic expansion frequently resulted in conflict and warfare between different agricultural civilizations. This competition and conflict among civilizations led people to become more deeply committed to particular religious beliefs and practices within their own groups. Cooperation to defend one's own civilization and religious tradition became essentia. According to these cognitive anthropologists, this competition among agricultural civilizations and their religious traditions expanded the sphere of cooperation and solidarity *within* groups, but often created the potential for enmity and conflict *between* different groups.

Aesthetics: Art and Music

Many anthropologists study the art and music of different societies throughout the world. They define **art** as a diverse range of activities and skills, and the products of those activities that are used as expressions and representations of human emotions, intellect, and creativity. Art includes different modes of painting, sculpture, printmaking, photography, and other visual media. *Architecture* is also an art form that involves the practical applications of creative expression in its buildings and structures. **Music** is an art form based on the organization of sounds in combination and in temporal relationships to produce audible works for performance in various communities. The field of ethnomusicology is the study of music as it is connected with the cultural traditions in different societies. Ethnomusicologists study songs, dances, musical instruments and compositions, and other dramatic performances that accompany music. Anthropologists and ethnomusicologists discuss how art and music have distinct functions for societies and individuals. Art and music help create social bonds through shared creative experiences and expressions of group identity. In addition, art and music enhance cognitive flexibility and reduce emotional anxiety for individuals. Art assists individuals and groups in extending their daily sensory and

imaginary experiences outside of the present, into the future and back into the past. Art and music can aid the construction of beliefs and patterns of morality as these creative processes interconnect with myths, legends, and collective narratives of their particular group. In all societies, exposure to art and music enter into childhood enculturation and help situate individuals within their environments. Often the major rites of passage and ceremonies regarding birth, initiation, coming of age, marriage, and death are accompanied by art and music. The symbolic imagery of the arts produces an imaginary world that assists in the cognitive and emotional development indispensable for human adaptations and becomes an important source of a meaningful life. In Western societies both art and music are historically associated with the fine arts or "high culture." Recall our discussion of anthropologist/sociologist Pierre Bourdieu's views of different forms of capital: economic capital, social capital, and cultural capital. Bourdieu described cultural capital as based on the *aesthetic* tastes and preferences for certain symbolic forms of literature, art, music, or foods that distinguished people with respect to their socioeconomic background. (1984). For many centuries, the upper-class elites of Western societies determined and established the criteria for *aesthetic* tastes, or preferences for what was beautiful or inspirational in fine art and music. Elite expressions of Western culture fine art were usually contrasted with popular, folk, or "primitive" art or music, which was characterized as less refined or backward and less sophisticated than fine art. However, anthropologists take a much broader crosscultural view of art and music than the Western elite. Although Franz Boas discussed the art in Northwest Coast American Indian cultures and entitled his book *Primitive Art* (1927), this work challenged the assumptions of the earlier elite understandings of art. Boas stressed the principle of cultural relativism and debunked the categories of "savages," or "primitive," versus civilized peoples. Anthropologists emphasize that art and musical expression are universal and found in all societies. Ethnomusicologists and anthropologists who study music and art find that what is considered beautiful or refined is dependent on the complex cultural context in

different societies. Thus, they challenge the Western elite views of *aesthetics* regarding perceptions of beauty and taste. This anthropological perspective entails a framework that includes the entire world's catalog of art and music that express and represent human emotions, intellect, and creativity. This anthropological perspective will become apparent in the later consideration of arts in different societies.

Religion among Foragers

The religions associated with modern foragers are based on oral traditions referred to by the religious studies scholar Mircea Eliade (1959) as "cosmic religions." These religions are intimately associated with nature. The natural cycle of seasons; inorganic matter such as rocks, water, and mountains; and other features of the natural environment are invested with sacred significance. All foraging societies have sacred places associated with the landscape where they live. These sacred spots are often marked or painted with petroglyphs (rock paintings) that identify the spiritual significance of the territories of these peoples. Spirit and matter are inseparable. In addition, cosmic religions are not identified with any particular historical events or individuals, as are the "literate" religious traditions of Judaism, Islam, Christianity, Buddhism, and Hinduism.

The sacredness of the natural environment is sometimes expressed in a form of **animism**, the belief that spirits reside within all inorganic and organic substances. The nineteenth-century anthropologist Edward Tylor used the term *animism* in reference to the earliest religious traditions. However, a number of current anthropologists are using the term *animism* to refer to the very respectful relationship between humans and others, including animals, plants, and inorganic objects in their cultural environment. Anthropologist Nurit Bird David describes how the hunter-gatherer Nayaka peoples of South India rerceive themselves as fully integrated with their ecological and social environment, which includes other organic and inorganic beings (1999). This Nayaka animistic view contrasts with the basic scientific

cosmologies that predominate in Western culture that tend to conceptualize individual humans as separate from nature and material substances. The metaphysical conceptions in the Ju'hoansi San, Australian Aborigine, or Mbuti cultural tradition tend to be similar to this new conception of animism currently adopted by anthropologists.

The Dreamtime

An illuminating example of a cosmic religion among foragers is the Australian Aborigine notion of dreamtime. The dreamtime exists in the "other world," the world associated with the time of creation, where a person goes in dreams and visions and after death. It is believed that at the time of creation, the ancestors deposited souls of all living forms near watering holes, and eventually these souls or spirits were embedded in all matter, from rocks and water to trees and humans. The unification of all substance and spirit was a byproduct of the work of these ancestral beings. All of these spirits come to the world from the dreamtime; the birth of the universe is like a fall from the dreamtime. The Aborigines had symbolic representations of their ancestral beings that anthropologists referred to as *totems*. A **totem** is a mythical ancestor, usually a plant or an animal, that symbolizes a particular group. **Totemism** is a religious belief that associates a particular group with a symbolic and spiritual connection with specific natural species, objects, or other phenomena. The Aborigines had totemic symbols such as kangaroos or wallabies or plants that symbolized their ancestral beings. The Aborigines believe that the ancestral beings still exist in the dreamtime, where they act as intermediaries between that world and the profane, everyday world of human affairs. The ancestral beings intervene in life, controlling plant, animal, and human life and death. This fundamental belief provides explanations for pain, joy, chaos, and order in human life. The dreamtime is a fundamental and complex conception that embraces the creative past and has particular significance for the present and future. The dreamtime also conveys certain

notions of morality. According to Aborigine traditions, the ancestral beings originally lived like other humans and had the capacity for being both moral and immoral, both good and evil. The immoral behavior of the dreamtime beings is highlighted to accentuate what is proper and moral in human affairs. Thus, this religion creates a moral order, which functions to sustain social control in the physical world.

Inuit Religion

The Inuit (Eskimo) maintain a traditional religious belief system that involves curers or healers who control and manipulate the supernatural world. In contrast to some of the "literate" religious traditions, Inuit religion did not assume the existence of an omnipotent supreme being. The Inuit did believe that every living creature possesses a soul or spirit that is reincarnated after death. The Inuit did not maintain a belief in an afterworld, or heaven, in which these souls congregate after death. Instead, they believed that the souls of the deceased remain near the living.

The spirits of animals allow themselves to be hunted and are constantly reincarnated in other animal forms, to be hunted again to ensure the Inuit way of life. Within these general conceptions of spirituality, the Inuit believe in *soul loss*, in which a person's soul is taken from the body as a result of unforeseen circumstances. Soul loss causes mental and physical illness for the individual. It is often believed that the soul has been stolen by another spirit. The Inuit coped with these situations through shamanism. Two major forms of shamanism are found in Inuit culture. One form is hereditary, passed on through either parent. The more common variety involves people who receive shamanistic powers through direct contact with the supernatural, usually through dreams, visions, or hallucinations. In most cases, the shamans are male; however, some Inuit females also become shamans. In the Bering Straits area, Inuit male and female shamans are believed to be able to own dead souls and spiritual beings called *tunghat*. Typically, the more spirits and souls these shamans own, the more they increase their spiritual status. The shamans are believed

to be able to journey to the realm of the dead souls and spiritual beings to induce changes in the weather or cure the sick or ensure the prosperity and reincarnation of animals.

People usually go through an extensive training period before they can begin practicing as a shaman. Eskimo shamans learn various relaxation and meditation techniques to induce trance states. They also learn methods of healing, curing, and exorcism. These techniques are used to produce group emotional experiences to enhance spiritual growth. In many cases, the shamanistic performances work effectively in curing illnesses or resolving emotional problems. Undoubtedly, in certain instances, the Eskimo beliefs and cultural conceptions surrounding shamanism trigger certain states of mind that produce positive psychological and even physical consequences, such as overcoming illness and injuries.

Rites of Passage among Foragers

The Australian aborigine rites of passage were connected to the beliefs of dreamtime described above. According to Aborigine conceptions, life without the dreamtime is extremely unsatisfactory. The invisible side of life becomes visible through rituals, ceremonies, myths, art, and dreams. Aborigines believe that through these activities they communicate with their ancestral beings. This belief is reflected in Aborigine rites of passage. In initiation rite of passage ceremonies at puberty, it is believed that the individual moves farther and farther back into the dreamtime. In puberty rituals, which for males included circumcision, *subincision* (the cutting of the penis lengthwise to the urethra), and other bloodletting actions, the individual is dramatically moved from one status to another through contact with the dreamtime. The rite of passage at death moves the individual into the invisibility of the dreamtime. The period of childhood among foragers is a time of playful activity and excitement. But it is also a time when children learn their basic subsistence activities, economic responsibilities, and political roles. In his studies of the Mbuti of the

African Congo, Turnbull has provided us with a thorough account of childhood in a foraging society. At the age of three, the Mbuti child enters the *bopi*, a tiny camp about a hundred yards away from the main camp, which might be considered a playground. Older children and adults do not enter the bopi. Within the bopi, all the children are part of an age grade and are equal to one another and remain so throughout the rest of their lives. It is the area in which children become enculturated and learn the importance of age, kinship, and gender and of the activities associated with these statuses. Within the bopi are noncompetitive play activities for boys and girls. Many of these activities reinforce the rules of hunting and gathering. The elders bring the children out of the bopi to show them how to use nets to hunt animals. Children also play house to learn how to take care of their households later in life. Before the age of puberty, boys and girls quit going into the bopi and join the main camp with older youths. When they reach puberty, Mbuti males and females have separate, informal rites of passage. The puberty ritual, known as the Elima for Mbuti females, occurs at the first menstruation, which is an occasion for great rejoicing because it is a sign that the girl is ready for marriage and motherhood. For a month, the girl resides in a special hut with her age-mates, and she is watched over by an older female. The girl learns the special songs of the Elima and occasionally appears in front of the hut while young men sit outside to admire the girls. At this time, the females sing the Elima songs, and the boys sing in response in a form of flirtation. Through their participation in the Elima ritual, the Mbuti males demonstrate their readiness for adulthood and marriage.

Among the Ju'hoansi or Kung San, young teenage males had to kill their first antelope and were tattooed on their foreheads, but also went through a rigorous rite of passage called *choma* in which they had to experience hunger, cold, thirst, and extreme fatigue from continuous dancing over a six-week period while learning much cultural knowledge. The Baka foragers of the Cameroon also had dramatic rite of passage rituals. They would have their teeth filed and chipped, proving their courage and endurance. During the ritual, the initiates would be surrounded and teased by

other children.

Art, Music, and Religion

The art of foraging societies is intimately related to nature. Animals, plants, humans, and other components of the natural environment are the major subjects. This naturalistic art also has a religious significance, as nature and spirit are viewed as inseparable. Rock paintings with highly symbolic images of natural phenomena are found in most foraging societies. It is believed that this art is sacred and can be used to make contact with supernatural sources. Traditional Inuit (Eskimo) art products include many items made from ivory, one of the few rigid materials available in the Arctic. Human and animal figurines, which were worn as amulets to enhance supernatural powers and practices, dominate Eskimo artistic output. The Eskimo also carve masks in ivory (or sometimes wood) for use by their shamans.

The music of foraging societies is generally divided into recreational (folk or popular) and religious music. The Mbuti, for example, have no instrumental music, but they have many songs and dances. In their vocal music, they have a precise sense of harmony, giving each singer one note to produce at a given moment. This leads to a harmonic pattern that is passed around a circle of people. This technique is often used in Mbuti recreational music. The sacred music of the Mbuti is believed to be much more important than their recreational music, and much of it is linked to the *Elima* rites of passage discussed earlier.

In the *Elima*, young girls and boys sing back and forth to one another in harmony. There are also other sacred songs that only men sing. The intensity of the singing builds so as to reach the spirit of the rain forest. One of the hunters goes off into the forest to echo the song of his fellows so that the spirit may be sure to hear it. As in most societies, Mbuti ritual music usually has a standardized form, with little improvisation allowed. Ritual music helps sustain the cultural and spiritual traditions of the people. The lyrics of the music emphasize the sacred symbols that are

maintained in Mbuti society. As the group chants the music together, a sense of sacredness is created in the community.

Music and religion are inextricably bound within the shamanistic rituals of the Inuit (Eskimo). In the shamanistic performances, a drum is used to enhance the rhythmic songs. The shaman's songs are simple, chantlike recitations that have no actual words. Short phrases are repeated again and again. The drumming and song chants are used to establish contact with the spirits. Anthropologist Rodney Needham (1967) suggested that the use of instruments such as the drum in shamanistic rituals not only heightens the spiritual atmosphere of the ceremony, but also affects psychological (and neurological) processes that produce altered states of consciousness in individuals.

Art, Architecture, and Music

Each of the centers of civilizations in Mesopotamia, Egypt, India, China, Ancient Greece, Rome, as well as the Olmec, Mayan, and Incan cultures of the Americas, developed a unique, characteristic style of art and architecture. Much of this was reflected in the particular religions of these civilizations. For example, the paintings found on pottery or in other locations and sculpture of Mesopotamia and Egypt expressed the tradition of the semidivine rulers, priests, and various deities. Much of the ancient Greek and Roman architecture, paintings, pottery, and sculpture also focused on the spiritual deities. However, these classical artists paid particular attention to the beauty and form of the anatomy and muscles of the human body, as is evident in their paintings and sculpture.

In the Chinese and Indian civilizations, many art styles flourished in pottery, carving, calligraphy, and paintings. The art styles vary greatly from era to era, and each one is traditionally named after the ruling dynasty. For example, in China, the Tang Dynasty (618–907 a.d.) paintings emphasize idealized landscapes, whereas Ming Dynasty (1368–1644 a.d.) paintings, which are busy and colorful, focus on

narrative storytelling. In the medieval period in Western and Byzantine civilizations, the focus of art was to glorify the biblical and religious themes of the Christian tradition with the use of glass mosaics, vivid colors, and gold in the backgrounds of paintings. In much of the Islamic world, there was a prohibition on using human images in sculpture or painting, which resulted in an emphasis on using calligraphy representing verses of the Qur'an and geometric patterns in paintings and architecture.

Various styles of music unique to each agricultural civilization flourished during different periods. In Mesopotamia and Egypt, harps, flutes, lyres, lutes, and cymbals have been represented in paintings and sculptures and discovered as artifacts by archaeologists. Indian classical music is one of the oldest musical traditions in the world, extending back to the Vedic religious tradition. In the Vedic tradition, forms of chanting were developed that are still present in the Hindu ritual tradition today. Indian classical music evolved what is known as *raga* rhythms and tones played with sitars, drums, and flutes; it is often accompanied by classical dancers. Indian classical dance emerged within the *Bhakti* tradition, where young females learned dances devoted to specific Hindu deities. Chinese royal court musicians developed their own musical notation and styles of musical genres accompanied by string and wind instruments. The royal courts of Korea, Central, and Southeast Asia had musical traditions based on religious themes.

In Western cultures, music was derived from the classical traditions of ancient Greece. The Greek theater had mixed male and female choruses for both secular entertainment and spiritual ceremonies. Various string instruments such as the lyre as well as wind instruments were developed, and musical literacy was an important part of education for elite males. During the medieval period of Western culture, the Catholic Church initiated a form of chanting in Latin, which eventually developed into the monophonic sacred liturgy known as the Gregorian chant. Although much of the music of the Western medieval period was based on sacred church music, there also existed a vibrant tradition of folk secular songs and dances that emerged in the

rural communities of serfs and peasants.

Art and Music

Art. After the industrial and scientific revolutions, Western artistic developments reflected these technological, economic, social, and cultural trends. Artistic paintings, sculptures, and printmaking became more secular in content and theme than in previous eras. However, in the eighteenth and nineteenth centuries, some Western artists began to reject these secular and scientific developments, resulting in what is known as the Romantic period that focused on the emotions and passions of individuals. Later artistic movements derived from the Romantic period were symbolism and impressionism, as developed by painters such as Claude Monet and Vincent Van Gogh. Western artistic movements in the twentieth century led to cubism, dadaism, surrealism, and a variety of styles including abstract impressionism, abstract expressionism, symbolism, and modernism, each attempting to innovate beyond the other. Some of these developments were initiated by the increasing global connections of the twentieth- and twenty-first-century artists, as Pablo Picasso, Henri Matisse, and Paul Gauguin incorporated indigenous art forms of Africa, Asia, Native America, the Pacific Islands, and elsewhere. During the Cold War, the Soviet Union and Eastern European socialist countries had their own artistic developments emphasizing social realism and depictions of ideal worker conditions. Throughout the industrial world in architecture, the skyscraper became the symbolic form associated with the power of modern progress.

A postmodern artistic movement that influenced painting, sculpture, and architecture emerged with the age of postindustrialism in the 1960s and 70s that recycled and mixed classical art forms from the past with novel expressions of twentieth- and twenty-first-century art. In addition, this postmodern artistic movement was influenced by the anthropological perspective and cultural relativism that questioned the aesthetic barriers between so-called “high culture” or the “fine

arts" and popular or folk art. Contemporary painting, sculpture, printmaking, film, or other visual media are significantly shaped by global interconnections that highlight the hybridity among different styles that create a global artistic culture. Ongoing anthropological research on this hybridity of art styles and movements continues to contribute towards a broad crosscultural and intercultural interpretation of global artistic developments.

Music. The music of industrial and postindustrial societies also reflected the new socioeconomic, political, and secular trends. In the musical tradition of Europe, public concerts and operas featured singers, strings, brass, woodwinds, pipe organs, harpsichords, and other instruments that had both religious and secular elements. Although these early classical music traditions were associated with the aristocracy, the ideals of the French Revolution that emphasized universal human rights and the breakdown of the feudal aristocratic order influenced composers such as Ludwig Beethoven to produce major symphonic works that reflected the ideals of rights for everyone. Beethoven represents the composer who merged the classical and Romantic trends in the music of Europe. Later Romantic composers such as the German Richard Wagner drew on the folk religions of Europe to write operas to express the new nationalistic political trends in Germany and elsewhere. This Romantic musical movement attempted to express the emotional and passionate aspects of the new nationalism emerging in Europe.

In the twentieth century, with the development of the phonograph and radio, all types of music began to be distributed and listened to throughout the world. With the expansion of these media, the U.S. blues and jazz that developed from the slavery experience of African-Americans became an extremely important genre of global music. These forms of African-American musical styles were adopted by white American composers and big bands, thus becoming the mainstream popular music of the 1920s, 30s, and 40s. Similarly, in the mid-twentieth century, rock and roll music, derived from blues, jazz, and country music using electric or acoustic guitars, piano

keyboards, saxophones, harmonicas, and other instruments, became an influential popular music trend. After the 1960s, in the postindustrial societies of the United States, Europe, and Japan, different subgenres of rock and roll, such as rockabilly, jazz-rock fusion, blues rock, heavy metal, punk rock, and rap and hip-hop music initiated by African-Americans influenced global musical developments. Since that time, like in other art forms, with increasing interconnections among societies, hybridity among different musical forms has been expanding the range of a global music culture. For example, a 2014 music and art exhibition in Canada called *Beat Nation: Hip Hop as Indigenous* combines the indigenous music and art from the Native Americans of Canada with the beats and graffiti of hip-hop music and art to challenge stereotypes. Ethnomusicologists have been engaged in recording music and describing how the music is integrated with culture contexts of various societies around the world. Mickey Hart, the drummer for the Grateful Dead, a popular rock and roll group, has been interested in ethnomusicology for many years. In a book sponsored by National Geographic called *Songcatchers: In Search of the World's Music* (2003), Hart explores how ethnomusicologists have been attempting to record and preserve music in different areas of the world. He traces the very first recordings of ethnomusicologist and songcatcher, Jesse Walter Fewkes, who conserved the singing of a Passamaquoddy Indian in 1890. Since that first recording, Hart describes the various ethnomusicologists who have taken their equipment to every remote corner of the world to help preserve the musical expressions of humanity. Ethnomusicologists continue to expand our musical horizons by recording and conserving the world's musical styles and developments.

Part 2. Architecture and Technology

1914 Antonio Sant' Elia

Manifesto of Futurist Architecture

Antonio Sant' Elia (1888–1916) was an Italian architect active in the years just before the First World War. He moved to Milan in 1912 to begin his architectural practice and quickly became active among the restless avant-garde of artists, writers, and designers.

His reputation rests almost entirely on a series of visionary drawings he made for the *Citta Nuova* (new city), which combined the novel elements of the industrial city with elements of the architecture of Otto Wagner and Adolf Loos. He displayed the drawings of the new city in 1914 as a member of the *Nuove Tendenze,* It is a subject of much debate how much of the manifesto was actually written by Sant' Elia, and how much was crafted by Filippo Tommaso Marinetti.

His views about the mechanization or elimination of ornament are not original and can be traced to Loos and Wagner, but like Wright's earlier, more cautious statement, the manifesto welcomes the change brought by industrialization. And it is in the final point of his proclamation that we read the characteristic change: "the fundamental characteristics of Futurist architecture will be its impermanence and transience."

No architecture has existed since 1700. A moronic mixture of the most various stylistic elements used to mask the skeletons of modern houses is called modern architecture. The new beauty of cement and iron is profaned by the superimposition of motley decorative incrustations that cannot be justified either by constructive necessity or by our (modern) taste, and whose origins are in Egyptian, Indian or Byzantine antiquity and in that idiotic flowering of stupidity—and impotence—that took the name of NEOCLASSICISM.

These architectonic prostitutions are welcomed in Italy, and rapacious alien ineptitude is passed off as talented invention and as extremely up-to-date architecture. Young Italian architects (those who borrow originality from clandestine and compulsive devouring of art journals) flaunt their talents in the new quarters of our towns, where a hilarious salad of little ogival columns, seventeenth-century foliation, Gothic pointed arches, Egyptian pilasters, rococo scrolls, fifteenth-century cherubs, swollen caryatids, take the place of style in all seriousness, and presumptuously put on monumental airs. The kaleidoscopic appearance and reappearance of forms, the multiplying of machinery, the daily increasing needs imposed by the speed of communications, by the concentration of population, by hygiene, and by a hundred other phenomena of modern life, never cause these self-styled renovators of architecture a moment's perplexity or hesitation. They persevere obstinately with the rules of Vitruvius, Vignola, and Sansovino plus gleanings from any published scrap of information on German architecture that happens to be at hand. Using these, they continue to stamp the image of imbecility on our cities, our cities which should be the immediate and faithful projection of ourselves.

And so this expressive and synthetic art has become in their hands a vacuous stylistic jumble of ill-mixed formulae to disguise a run-of the-mill traditionalist box of bricks and stones a modern building. As if we who are accumulators and generators of movement, with all our added mechanical limbs, with all the noise and speed of our life, could live in streets built for the needs of men four, five or six centuries ago.

This is the supreme imbecility of modern architecture, perpetuated by the venal complicity of the academies, the internment camps of the intelligentsia, where the young are forced into the onanistic recopying of classical models instead of throwing their minds open in the search for new frontiers and in the solution of the new and pressing problem: THE FUTURIST HOUSE AND CITY.

The house and the city that are ours both spiritually and materiality, in which our tumult can rage without seeming a grotesque anachronism.

The problem posed in Futurist architecture is not one of linear rearrangement. It is not a question of finding new mouldings and frames for windows and doors, of replacing columns, pilasters and corbels with caryatids, flies and frogs. Neither has it anything to do with leaving a facade in bare brick, or plastering it, or facing it with stone or in determining formal differences between the new building and the old one. It is a question of tending the healthy growth of the Futurist house, of constructing it with all the resources of technology and science, satisfying magisterially all the demands of our habits and our spirit trampling down all that is grotesque and antithetical (tradition, style, aesthetics, proportion), determining new forms, new lines, a new harmony of profiles and volumes, an architecture whose reason for existence can be found solely in the unique conditions of modern life, and in its correspondence with the aesthetic values of our sensibilities. This architecture cannot be subjected to any law of historical continuity. It must be new, just as our state of mind is new. The art of construction has been able to evolve with time, and to pass from one style to another, while maintaining unaltered the general characteristics of architecture, because in the course of history changes of fashion are frequent and are determined by the alternations of religious conviction and political disposition. But profound changes in the state of the environment are extremely rare, changes that unhinge and renew, such as the discovery of natural laws, the perfecting of mechanical means, the rational and scientific use of material. In modern life the process of stylistic development in architecture has

been brought to a halt.

ARCHITECTURE NOW MAKES A BREAK WITH TRADITION. IT MUST PERFORCE MAKE A FRESH START.

Calculations based on the resistance of materials, on the use of reinforced concrete and steel, exclude ‘architecture’ in the classical and traditional sense. Modern constructional materials and scientific concepts are absolutely incompatible with the disciplines of historical styles, and are the principal cause of the grotesque appearance of ‘fashionable’ buildings in which attempts are made to employ the

lightness, the superb grace of the steel beam, the delicacy of reinforced concrete, in order to obtain the heavy curve of the arch and the bulkiness of marble.

The utter antithesis between the modern world and the old is determined by all those things that formerly did not exist. Our lives have been enriched by elements the possibility of whose existence the ancients did not even suspect. Men have identified material contingencies, and revealed spiritual attitudes, whose repercussions are felt in a thousand ways. Principal among these is the formation of a new ideal of beauty that is still obscure and embryonic, but whose fascination is already felt even by the masses. We have lost our predilection for the monumental, the heavy, the static, and we have enriched Rethinking technology our sensibility with a taste for the light, the practical, the ephemeral, and the swift. We no longer feel ourselves to be the men of the cathedrals, the palaces, and the podiums. We are the men of the great hotels, the railway stations, the immense streets, colossal ports, covered markets, luminous arcades, straight roads, and beneficial demolitions.

We must invent and rebuild the Futurist city like an immense and tumultuous shipyard, agile, mobile, and dynamic in every detail; and the Futurist house must be like a gigantic machine. The lifts must no longer be hidden away like tapeworms in the niches of stairwells; the stairwells themselves, rendered useless, must be abolished, and the lifts must scale the lengths of the façades like serpents of steel and glass. The house of concrete, glass, and steel, stripped of paintings and sculpture, rich only in the innate beauty of its lines and relief, extraordinarily ‘ugly’ in its mechanical simplicity, higher and wider according to need rather than the specifications of municipal laws. It must soar up on the brink of a tumultuous abyss: the street will no longer lie like a doormat at ground level, but will plunge many storeys down into the earth, embracing the metropolitan traffic, and will be linked up for necessary interconnections by metal gangways and swift-moving pavements.

THE DECORATIVE MUST BE ABOLISHED. The problem of Futurist architecture must be resolved, not by continuing to pilfer from Chinese, Persian, or Japanese photographs or fooling around with the rules of Vitruvius, but through

flashes of genius and through scientific and technical expertise. Everything must be revolutionized. Roofs and underground spaces must be used; the importance of the façade must be diminished; issues of taste must be transplanted from the field of fussy mouldings, finicky capitals and flimsy doorways to the broader concerns of BOLD GROUPINGS AND MASSES, and LARGE-SCALE DISPOSITION OF PLANES. Let us make an end of monumental, funereal and commemorative architecture. Let us overturn monuments, pavements, arcades and flights of steps; let us sink the streets and squares; let us raise the level of the city.

I COMBAT AND DESPISE:

1 All the pseudo-architecture of the avant-garde, Austrian, Hungarian, German, and American;

2 All classical architecture, solemn, hieratic, scenographic, decorative, monumental, pretty, and pleasing;

3 The embalming, reconstruction, and reproduction of ancient monuments and palaces;

4 Perpendicular and horizontal lines, cubical and pyramidical forms that are static, solemn, aggressive, and absolutely excluded from our utterly new sensibility;

5 The use of massive, voluminous, durable, antiquated, and costly materials.

AND PROCLAIM:

1 That Futurist architecture is the architecture of calculation, of audacious temerity and of simplicity; the architecture of reinforced concrete, of steel, glass, cardboard, textile fibre, and of all those substitutes for wood, stone, and brick that enable us to obtain maximum elasticity and lightness;

2 That Futurist architecture is not because of this an arid combination of practicality and usefulness, but remains art, i.e. synthesis and expression;

3 That oblique and elliptic lines are dynamic, and by their very nature possess an emotive power a thousand times stronger than perpendiculars and horizontals, and that no integral, dynamic architecture can exist that does not include these;

4 That decoration as an element superimposed on architecture is absurd, and

that THE DECORATIVE VALUE OF FUTURIST ARCHITECTURE DEPENDS SOLELY ON TILE USE AND ORIGINAL ARRANGEMENT OF RAW OR BARE OR VIOLENTLY COLOURED MATERIALS;

5 That, just as the ancients drew inspiration for their art from the elements of nature, we—who are materially and spiritually artificial—must find that inspiration in the elements of the utterly new mechanical world we have created, and of which architecture must be the most beautiful expression, the most complete synthesis, the most efficacious integration;

6 That architecture as the art of arranging forms according to pre-established criteria is finished;

7 That by the term architecture is meant the endeavour to harmonize the environment with Man with freedom and great audacity, that is to transform the world of things into a direct projection of the world of the spirit.

From an architecture conceived in this way no formal or linear habit can grow, since the fundamental characteristics of Futurist architecture will be its impermanence and transience. THINGS WILL ENDURE LESS THAN US. EVERY GENERATION MUST BUILD ITS OWN CITY. This constant renewal of the architectonic environment will contribute to the victory of Futurism which has already been affirmed by WORDS-IN-FREEDOM, PLASTIC DYNAMISM, MUSIC WITHOUT QUADRATURE, AND THE ART OF NOISES, and for which we fight without respite against traditionalist cowardice.

(Amplified from catalogue introduction, 'Nuove Tendenze'. Milan, 1914. Published in *Lacerba* (Florence), 1 August 1914.)

1923 Le Corbusier

Engineer's, Aesthetic and Architecture

Le Corbusier (1887–1965) was the pseudonym of the Swiss architect, urbanist, furniture designer, artist, and writer Charles Edouard Jeanneret-Gris. He began his

career in Switzerland, and moved to Paris in 1916 where he formed a close artistic partnership with the painter Amédee Ozenfant and together developed the style they called Purism. They also began the journal *l'Esprit Nouveau,* for which Jeanneret developed his architectural pseudonym in 1920, Simultaneously, he began an architectural partnership with his cousin Pierre Jeanneret, which produced a pioneering body of modern architecture over the next fifty years. Le Corbusier's writings have been every bit as influential as his buildings, and perhaps the most important of his many books was *Vers une Architecture* of 1923, Originally written as a series of articles in *l'Esprit Nouveau,* and subsequently translated into English as *Towards a New Architecture* in 1931. In that book, Le Corbusier summarizes the issuses facing architecture in the first decades of the twentieth century: filth, disease, pollution, the effects of the car and transit, and the incorporation of mechanical and electrical systems. The section excerpted here is a summary that explains the challenge in a series of oppositions between the work of architects and that of engineers, between technical constraints and visual composition.

The excerpt is important for this collection in the influences understood to shape the work of the engineer, who must follow the "natural law" of economy and of efficiency.

The evolutionary forces of technology are seen to operate through the person and profession of the engineer, and to provide a beacon for the architect.

The Engineer's Æsthetic and Architecture—two things that march together and follow one from the other—the one at its full height, the other in an unhappy state of retrogression.

The Engineer, inspired by the law of Economy and governed by mathematical calculation, puts us in accord with universal law. He achieves harmony.

The Architect, by his arrangement of forms, realizes an order which is a pure creation of his spirit; by forms and shapes he affects our senses to an acute degree, and provokes plastic emotions; by the relationships which he creates he wakes in us profound echoes, he gives us the measure of an order which we feel to be in

accordance with that of our world, he determines the various movements of our heart and of our understanding; it is then that we experience the sense of beauty.

The Engineer's Æsthetic and Architecture—two things that march together and follow one from the other—the one at its full height, the other in an unhappy state of retrogression.

A QUESTION of morality; lack of truth is intolerable, we perish in untruth.

Architecture is one of the most urgent needs of man, for the house has always been the indispensable and first tool that he has forged for himself. Man's stock of tools marks out the stages of civilization, the stone age, the bronze age, the iron age. Tools are the result of successive improvement; the effort of all generations is embodied in them. The tool is the direct and immediate expression of progress; it gives man essential assistance and essential freedom also. We throw the out-of-date tool on the scrap-heap: the carbine, the culverin, the growler and the old locomotive. This action is a manifestation of health, of moral health, of *morale* also; it is not right that we should produce bad things because of a bad tool; nor is it right that we should waste our energy, our health and our courage because of a bad tool; it must be thrown away and replaced.

But men live in old houses and they have not yet thought of building houses adapted to themselves. The lair has been dear to their hearts since all time. To such a degree and so strongly that they have established the cult of the home. A *roof!* then other household gods. Religions have established themselves on dogmas, the dogmas do not change; but civilizations change and religions tumble to dust. Houses have not changed. But the cult of the house has remained the same for centuries. The house will also fall to dust.

A man who practises a religion and does not believe in it is a poor wretch; he is to be pitied. We are to be pitied for living in unworthy houses, since they ruin our health and our *morale.* It is our lot to have become sedentary creatures; our houses gnaw at us in our sluggishness, like a consumption. We shall soon need far too many sanatoriums. We are to be pitied. Our houses disgust us; we fly from them and

frequent restaurants and night clubs; or we gather together in our houses gloomily and secretly like wretched animals; we are becoming demoralized.

Engineers fabricate the tools of their time. Everything, that is to say, except houses and moth-eaten boudoirs. There exists in France a great national school of architecture, and there are, in every country, architectural schools of various kinds, to mystify young minds and teach them dissimulation and the obsequiousness of the toady. National schools!

Our engineers are healthy and virile, active and useful, balanced and happy in their work. Our architects are disillusioned and unemployed, boastful or peevish. This is because there will soon be nothing more for them to do. *We no longer have the money* to erect historical souvenirs. At the same time, we have got to wash! Our engineers provide for these things and they will be our builders. Nevertheless there does exist this thing called ARCHITECTURE, an admirable thing, the loveliest of all. A product of happy peoples and a thing which in itself produces happy peoples.

The happy towns are those that have an architecture. Architecture can be found in the telephone and in the Parthenon. How easily could it be at home in our houses! Houses make the street and the street makes the town and the town is a personality which takes to itself a soul, which can feel, suffer and wonder. How at home architecture could be in street and town!

The diagnosis is clear. Our engineers produce architecture, for they employ a mathematical calculation which derives from natural law, and their works give us the feeling of HARMONY. The engineer therefore has his own aesthetic, for he must, in making his calculations, qualify some of the terms of his equation; and it is here that taste intervenes. Now, in handling a mathematical problem, a man is regarding it from a purely abstract point of view, and in such a state, his taste must follow a sure and certain path.

Architects, emerging from the Schools, those hot-houses where blue hortensias and green chrysanthemums are forced, and where unclean orchids are cultivated, enter into the town in the spirit of a milkman who should, as it were, sell his milk

mixed with vitriol or poison.

People still believe here and there in architects, as they believe blindly in all doctors. It is very necessary, of course, that houses should hold together! It is very necessary to have recourse to the man of art! Art, according to Larousse, is the application of knowledge to the realization of a conception. Now, today, it is the engineer who knows, who knows the best way to construct, to heat, to ventilate, to light. Is it not true? Our diagnosis is that, to begin at the beginning, the engineer who proceeds by knowledge shows the way and holds the truth. It is that architecture, which is a matter of plastic emotion, should in its own domain BEGIN AT THE BEGINNING ALSO, AND SHOULD USE THOSE ELEMENTS WHICH ARE CAPABLE OF AFFECTING OUR SENSES, AND OF REWARDING THE DESIRE OF OUR EYES, and should dispose them in such a way THAT THE SIGHT OF THEM AFFECTS US IMMEDIATELY by their delicacy or their brutality, their riot or their serenity, their indifference or their interest; these elements are plastic elements, forms which our eyes see clearly and which our mind can measure. These forms, elementary or subtle, tractable or brutal, work physiologically upon our senses (sphere, cube, cylinder, horizontal, vertical, oblique, etc.), and excite them. Being moved, we are able to get beyond the cruder sensations; certain relationships are thus born which work upon our perceptions and put us into a state of satisfaction (in consonance with the laws of the universe which govern us and to which all our acts are subjected), in which man can employ fully his gifts of memory, of analysis, of reasoning, and of creation.

Architecture today is no longer conscious of its own beginnings. Architects work in styles “or discuss questions of structure in and out of season; their clients, the public, still think in terms of conventional appearance, and reason on the foundations of an insufficient education. Our external world has been enormously transformed in its outward appearance and in the use made of it, by reason of the machine. We have gained a new perspective and a new social life, but we have not yet adapted the house thereto.

The time has therefore come to put forward the problem of the house, of the street and of the town, and to deal with both the architect and the engineer. For the *architects* have written our "THREE REMINDERS:" MASS which is the element by which our senses perceive and measure and are most fully affected. SURFACE which is the envelope of the mass and which can diminish or enlarge the sensation the latter gives us. PLAN which is the generator both of mass and surface and is that by which the whole is irrevocably fixed. Then, still for the architect, "REGULATING LINES" showing by these one of the means by which architecture achieves that tangible form of mathematics which gives us such a grateful perception of order. We wished to set forth facts of greater value than those in many dissertations on the soul of stones. We have confined ourselves to the natural philosophy of the matter, *to things that can be known*.

We have not forgotten the dweller in the house and the crowd in the town. We are well aware that a great part of the present evil state of architecture is due to the *client*, to the man who gives the order, who makes his choice and alters it and who pays. For him we have written "EYES WHICH DO NOT SEE." We are all acquainted with too many big business men, bankers and merchants, who tell us: "Ah, but I am merely a man of affairs, I live entirely outside the art world, I am a Philistine." We protest and tell them: "All your energies are directed towards this magnificent end which is the forging of the tools of an epoch, and which is creating throughout the whole world this accumulation of very beautiful things in which economic law reigns supreme, and mathematical exactness is joined to daring and imagination. That is what you do; that, to be exact, is Beauty." One can see these same business men, bankers and merchants, away from their businesses in their own homes, where everything seems to contradict their real existence—rooms too small, a conglomeration of useless and disparate objects, and a sickening spirit reigning over so many shams—Aubusson, Salon d'Automne, styles of all sorts and absurd bric-à-brac. Our industrial friends seem sheepish and shrivelled like tigers in a cage; it is very clear that they are happier at their factories or in their banks.

We claim, in the name of the steamship, of the airplane, and of the motor-car, the right to health, logic, daring, harmony, perfection. We shall be understood. These are evident truths. It is not foolishness to hasten forward a clearing up of things. Finally, it will be a delight to talk of ARCHITECTURE after so many grain-stores, workshops, machines, and sky-scrapers. ARCHITECTURE is a thing of art, a

phenomenon of the emotions, lying outside questions of construction and beyond them. The purpose of construction is TO MAKE THINGS HOLD TOGETHER; of architecture TO MOVE US. Architectural emotion exists when the work rings within us in tune with a universe whose laws we obey, recognize and respect. When certain harmonies have been attained, the work captures us. Architecture is a matter of "harmonies," it is "a pure creation of the spirit."

Today, painting has outsped the other arts. It is the first to have attained attunement with the epoch.1 Modern painting has left on one side wall decoration, tapestry, and the ornamental urn and has sequestered itself in a frame—flourishing, full of matter, far removed from a distracting realism; it lends itself to meditation. Art is no longer anecdotal, it is a source of meditation; after the day's work it is good to meditate.

On the one hand the mass of people look for a decent dwelling, and this question is of burning importance. On the other hand the man of initiative, of action, of thought, the LEADER, demands a shelter for his meditations in a quiet and sure spot; a problem which is indispensable to the health of specialized people. Painters and sculptors, champions of the art of today, you who have to bear so much mockery and who suffer so much indifference, let us purge our houses, give your help that we may reconstruct our towns. Your works will then be able to take their place in the framework of the period and you will everywhere be admitted and understood. Tell yourselves that architecture has indeed need of your attention. Do not forget the problem of architecture.

I mean, of course, the vital change brought about by cubism and later researches, and not the lamentable fall from grace which has for the last two years

seized upon painters, distracted by lack of sales and taken to task by critics as little instructed as insensitive (1921).

1928 Siegfried Giedion

Construction. Industry. Architecture

Siegfried Giedion (1888–1968) was a Swiss historian of architecture. He was a student of the art historian Heinrich Wölfflin and a close friend of Walter Gropius, Le Corbusier, and others in the modern movement. In 1928 he helped found the Congrès International d'Architecture Moderne (CIAM), serving as its secretary general, and beginning a lifelong project of both promoting modern architecture and examining its origins in a commanding series of books and articles. Following the methods of the Swiss school of art history, Giedion sought to identify the *Zeitgeist* or spirit of modernism in comparative studies of modern art, modern physics, and modern industrial construction. The work that secured his reputation as the voice of the modern movement was *Space, Time and Architecture*, initially given as a series of lectures at Harvard in 1938–39, then published as a book in 1941, and still available today in its fifth edition. The book became required reading for nearly two generations of young architects, and described the compelling similarities between the space-time theories of Einstein and the pictoral experiments of modern artists and architects. But the real achievement of the work lay in its compelling account of nineteenth-century experiments with new materials and methods. That book was followed in 1948 by an even deeper investigation titled, *Mechanization Takes Command: A Contribution to Anonymous History*, which dug deep into the archives of patent offices and designers to understand mechanization in all its aspects. That account is often cited by historians of technology as a fundamental work in their field.

The following excerpt is drawn from his first book on modern architecture, *Bauen in Frankreich: Bauen in Eisen, Bauen in Eisenbeton* (Building in France,

Building in Iron, Building in Ferro-Concrete) of 1928. In these sections he establishes an analogy between construction and "life processes" to make the argument that nineteenth-century stylistic experiment had missed the real changes occurring in architecture. The dynamic, physiological understanding of history underlay much of the rest of his work, and led to his later interest in anonymous histories. He also used that interpretation to establish an ethical standard for future aesthetic experiments: "Thus, the point is reached where building falls in line with the general life process."

Construction

Is CONSTRUCTION something EXTERNAL?

We are being driven into an indivisible life process. We see life more and more as a moving yet indivisible whole. The boundaries of individual fields blur. Where does science end, where does art begin, what is applied technology, what belongs to pure knowledge? Fields permeate and fertilize each other as they overlap. It is hardly of interest to us today where the conceptual boundary between art and science is drawn. We value these fields not hierarchically but as equally justified emanations of the highest impulse: LIFE! To grasp life as a totality, to allow no divisions, is among the most important concerns of the age. Physiologists have shown that a person's body build and nature are inseparably connected. Science traces specific characters back to certain bodily types. The connection between respiration and mental balance has been discovered. The body takes its form internally through breathing, gymnastics, sport. To overdevelop an arm muscle, or to douse the face with cosmetics like an isolated body (as the arteries harden), is no longer acceptable.

Construction is also not mere ratio. The attitude that drove the previous century to expand our knowledge of matter, so much that it resulted in a previously inconceivable command of it, is as much the expression of an instinctive drive as is any artistic symbol. We say that art anticipates, but when we are convinced of the indivisibility of the life process, we must add: industry, technology, and construction also anticipate. Let us go further: architecture, which has certainly abused the name of art in many ways, has for a century led us in a circle from one failure to another.

Aside from a certain *haut-goût charm* the artistic drapery of the past century has become musty. What remains unfaded of the architecture is those rare instances when construction breaks through. Construction based entirely on provisional purposes, service, and change is the only part of building that shows an unerringly consistent development. Construction in the nineteenth century plays the role of the sub-conscious.

Outwardly, construction still boasts the old pathos; underneath, concealed behind facades, the basis of our present existence is taking shape.

Industry

Industry completes the transition from handicraft to machine production. Industry is only part of the problem connected with the transition from individual to collective design.

Machine work means serial design, precision. Handicraft has its own special charm that can never be replaced: the uniqueness of the product. But without machine work there is no higher technology. By hand one can neither mill sprocket wheels that fit frictionlessly together, nor draw out uniform wire, nor profile iron precisely. The transition from individual to collective design is taking place in all fields, practical as well as spiritual ones.

Now, it is the case that INDUSTRY, which is intensively involved with the life process, displayed this change before other fields—private life or art—took note of it. Industry, big industry, is a result of the French Revolution.

Before the French Revolution articles for everyday use were produced by the guilds. Guild membership was just as limited as the number of workers or helpers each member could take on and the kinds of product each could produce. That meant privilege in favor of a few and an extraordinary burden (gene onereuse) on the consumer. The complex instrument of industry was created through the possibility of a free division of labor. Like construction, industry is an inner expression of the life process. Though we are objectively able to create anticipatory designs, old mental “residues” prevent us for a long time from drawing the human consequences:

INDUSTRY anticipates society's inner upheaval just as construction anticipates the future expression of building. Even before industry existed in its present sense—around 1820—Henri de Saint-Simon (1760–1825) understood that it was the central concept of the century and that it was destined to turn life inside out: "The whole of society rests upon industry."

It seems that the force of Saint-Simon's influence on the schools and tendencies of the century lay, above all, in his ability to grasp the emerging reality and to transform it into a Utopia. It is the opposite method to the cultural idealism that dominated Germany at the time, which neglected reality in order to pursue emanations of pure spirit. Saint-Simon foresaw the great concentrations of labor, the urban centers, and the factories with thousands of workers that transferred the results of research directly into action. As a consequence of an industrial economy he foresaw the dawn of a classless society, the end of war, and the end of national borders: a single army of workers spanning the globe. The end of man's exploitation of man *(l'exploitation de l'homme par l'homme)* will have been achieved. The eye of the visionary no doubt simplifies and leaps over intermediary stages:5 Saint-Simon never reckoned with the century's divided soul, which in architecture as in society imposed the old formal apparatus on the new system. The anonymous process of production and the interconnected procedures that industry offers only now fully take hold of and reshape our nature.

Architecture

The concept of architecture is linked to the material of stone. Heaviness and monumentality belong to the nature of this material, just as the clear division between supporting and supported parts does.

The great dimensions that stone requires are for us still habitually connected with each building. It is entirely understandable that, with their unusually modest dimensions, the first buildings executed in tensile materials time and again evoked among contemporaries the concern that the building might collapse.

Architecture is linked to the concept of "monumentally." When the new

building materials—iron and ferroconcrete—assume the forms of gravity and "monumentality," they are essentially misused. It seems doubtful whether the limited concept of "architecture" will indeed endure. We can hardly answer the question: What belongs to architecture? Where does it begin, where does it end? Fields overlap: walls no longer rigidly define streets. The street has been transformed into a stream of movement. Rail lines and trains, together with the railroad station, form a single whole. Suspended elevators in glazed shafts belong to it just as much as the insulating filling between the supports. The antenna has coalesced with the structure, just as the limbs of a towering steel frame enter into a relationship with city and harbor. Tall buildings are bisected by rail lines. The fluctuating element becomes a part of building. Architecture has been drawn into the current from the isolated position it had shared with painting and sculpture.

We are beginning to transform the surface of the earth. We thrust beneath, above, and over the surface. Architecture is only a part of this process, even if a special one. Hence there is no "style," no proper building style. Collective design. A fluid transition of things.

By their design, all buildings today are as open as possible. They blur their arbitrary boundaries. Seek connection and interpenetration. In the air-flooded stairs of the Eiffel Tower, better yet, in the steel limbs of *a pont transbordeur,* we confront the basic aesthetic experience of today's building: through the delicate iron net suspended in midair stream things, ships, sea, houses, masts, landscape, and harbor. They lose their delimited form: as one descends, they circle into each other and intermingle simultaneously.

One would not wish to carry over into housing this absolute experience that no previous age has known. Yet it remains embryonic in each design of the new architecture: there is only a great, indivisible space in which relations and interpenetrations, rather than boundaries, reign.

The concept of architecture has become too narrow. One can no longer contain, like radium in a bottle, the need to create that which is called art and explain what

remains of life devoid of it.

The ponderous movement of human affairs has as its consequence that the new attitude toward life manifests itself much sooner in the objective fields—such as construction, industry—than in those fields that lie close to us.

Only now is the housing form being seized by those hidden forces that a century ago drove man to the constructional and industrial attitude.

Our inner attitude today demands of the house: Greatest possible overcoming of gravity. Light proportions. Openness, free flow of air: things that were first indicated in an abstract way by the constructional designs of the past century.

1929 Le Corbusier

Architecture: The Expression the Materials Methods of our Times

Le Corbusier (1887-1965) was the pseudonym of the Swiss architect, urbanist, furniture designer, artist, and writer Charles Edouard Jeanneret-Gris (see Le Corbusier, 1923 for full biography).

The following article was published in the *Architectural Record,* in August 1929, as part of a series solicited by the editors. It follows an article by Frank Lloyd Wright on the nature of materials, which may have suggested the title. On the one hand, the essay describes the deterministic effects of new materials and methods that characterize the first generation of technology studies. On the other hand, he grants the architect great power in choosing or adapting those influences.

Let us not confuse outward show, however impressive, with an essential truth which is still indistinct in the whirlpool of an epoch in the full tide of evolution.

By *"impressive outward show,"* it is implied that the architecture of today appears to be dictated in the eloquence of its form by modern materials and methods. *"Essential truth"* suggests an architecture that results from the state of mind of an epoch and that an architecture exists, *takes form* and is *expressed* only at that *very moment when a general evolution of mind is accomplished*. It is at that moment alone

when the mind has recognized and admitted a system of thought which, above all, represents in every field a profound modification of previous states. There is no architecture *during* periods of crisis; architecture comes *after* periods of crisis.

The crisis then has passed? From the consideration of the world about us the opposite seems certain. Perhaps not; a few spirits (not all—far from that, but only those of leaders—and that is enough) have passed through the crisis, and have formulated a new attitude of mind which follows *completed changes*. Only objects—material reality—are in a state of complete disturbance. And why are they? Because precisely at this moment, there breathes a new spirit and the entire world—both man and materials—must inevitably follow the implacable destiny of a new tendency.

Is there then indeed an origin to this profound upheaval? Most certainly. *It has existed for a hundred years.* During the century our brains have escaped from ancient customs. Our life has gone from day to day, changed bit by bit. And thus we scarcely appreciate it. We were unable to know where all this was leading, we could feel only that it *was* leading, powerfully, violently, and ever and ever more rapidly. Meanwhile, shallow spirits of limited vision cried out: "The world is being wrecked, all is lost." And in desperation, like shipwrecked sailors grasping at floating debris, we clung to the past. Never before had so much archaeology been done as during those heroic times when science was pushing us, each day more insistently, along the adventurous paths that lead towards the unknown.

Is not architecture determined by new materials and new methods? (It is high time I were defining what architecture is.) Indeed to all in America belong the new materials, with you modern methods are in use. But for a hundred years your architecture has not evolved. Alone your programs have changed. And you construct your skyscrapers in the manner of students of the Ecole des Beaux-Arts building a private house. I repeat: a hundred years of new materials and new methods have made no change whatsoever in your architectural viewpoint.

* * *

It is time, though, to define architecture. Architecture is not building.

Architecture is that cast of synthetical thought in response to which the multiple elements of architecture are led synchronically to *express a purpose*. And as this synthetical purpose is absolutely disinterested, having for object neither to make durable, nor to build rapidly, nor to keep warm, nor to promote sanitation, nor to standardize the domestic usefulness of the house, I would say, since it is above any utilitarian objective, it is an elevated purpose. Its object is to bring us benefits of a different nature from those of material usefulness; its aim is to transport us to an inspired state and thus to bring us enjoyment.

Saying this I find myself in accord with the humblest accomplishment of the simplest conscientious laborer, and on the other hand I put myself in agreement with all the great traditions of the past.

* * *

Nevertheless, there exists in these days, an absorption in definitely practical ideas which is precisely expressed by the subject which was suggested to me, "Architecture, the expression of the materials and methods of our times." I will even say that it is the clue to the present situation. And here is the reason: A system of thought is imbued with life only when there exists a balance between the results of evolution and the spiritual direction of its progress. What, then, is the direction of its progress today? A hundred years of a mechanical era have brought forth an entirely new spectacle. Geometry is supreme. Precision is everywhere. The right angle prevails. There no longer exists any object that does not tend to severity. Industrialism has stated the postulate of economy: To attain the maximum of result at the minimum of expense.

Science, mathematics, analysis, and hypothesis, have all created an authentic machinery of thought. An imperative need of clarity, the search for the *solution*. It is for that which the mathematicians term the *"elegant solution."* Has not this all-pervading precision, exactness, and accuracy definitely annihilated the imperceptible, distance and mystery? Miraculously, *quite the contrary is* the case. This century has officially opened to us gates yawning on the infinite, on majesty, silence, and

mystery. More than ever before, man's soul is pathetically brought face to face with itself. Never was there an epoch so powerfully, so unanimously inspired. Poetry is everywhere, constant, immanent.

* * *

Here, then, is set forth that point of view which constitutes the present era, a veritable magnetic pole towards which swings the compass of *our initiatives, of all our initiatives*. Let us come to the point. What, in view of the purity and supreme clarity of this new state of thought, are our present architectural forms? Do we concern ourselves with this gleaming liberty of disinterestedness, of courage and poetry? Alas, how timid we are, how firmly we are chained, like slaves. The past has ensnared us, whereas its law is to cry to us, "carry on—why don't you progress and move forward?" We are cowardly and timorous, lazy and without imagination. Cowardly, timorous, lazy, and without imagination, because, now and invariably, we want our new houses to resemble the old. What a poverty of creative ability! Meanwhile the means are at hand; science, mathematics, industry, organization. We still permit our houses to lie close to a damp and unhealthy ground. We are still discussing whether or not our houses are to have roofs, while roof gardens bring health, joy, and an upheaval of plan replete with magnificent liberties. We are still building our houses of stone, with massive walls, while light and slender cars are speeding at sixty miles an hour through snows or under the tropical sun. We are still employing masons and carpenters *on the job,* to work in rain or snow, or fair weather, while factories could turn out to perfection that which we accept poorly executed. And so forth and so on.

* * *

Here, now, are my conclusions. In what way are we to allow so many innovations? How are we to select these forms still unknown in the building of houses? How are we to arrange them in such a manner as will bring us anew before an architectural phenomenon as will make us feel once more the vigorous delights of architecture? A state of new enthusiasm exists; a system of thought has been wrought

by a hundred years of investigation and acquired results. We have a *line of conduct.* Instinctively our choice tends towards such constructive systems, towards such materials as possess forces capable of feeding our enthusiasm. In us moderns the new feelings, an instinct, control actions which are in harmony with each other. The harmony of former centuries is in confusion. The effect continues but the cause has been swept aside by the mechanical revolution. The mechanical revolution is a new cause—immense phenomenon in the history of mankind. Where are the new effects? Let us be led by this enthusiasm which animates us. Industrialization, standardization, mass production, all are magnificent implements; let us use these implements. I wish to give you the basis of my reasoning: I am certain that that which at this moment appears most revolutionary in contemporary architectural creations, be it in France, Germany, Russia, or elsewhere—all that is *still nothing more than the old aspect caught in the quicksands of the past*. It is my opinion that as yet we have seen nothing new, done nothing new. That which will come in architecture will survive only when an urbanism, brought face to face with the present social upheaval, will have created cities of which we have as yet not even an idea, of which we have not yet even considered the possibility.

Such is the progress on the one hand (and it is gigantic by comparison with the means at the disposal of the builders of the Romanesque period, or that of Louis XIV) and on the other hand the architects of the contemporary epoch daring at last to state a problem, and to announce the answer, and thus to give to the world an architectural system which is the resultant of the spirit of an era.

The line of action exists—the modern system of thinking. The Americans, however, are the people who, having done most for progress, remain for the most part timidly chained to dead traditions. On the other hand, their willingness to progress further strikes me as boundless. And that is a force which, soon, will swing the balance.

1950 Ludwig Mies van der Rohe

Technology and Architecture

The German architect Ludwig Mies van der Rohe (1886–1969) was a prolific architect, and a significant educator, both in Gemany, and, later, in the United States. After working under Peter Behrens (1868–1940), Mies established his own office, working as a neo-classicist. After the First World War, Mies became taken with the avant-garde, abandoning the ornament of his earlier work in favor of a skin and bones approach. In 1921, Mies produced his most daring proposal with the German Pavilion for the Barcelona exhibition, and Villa Tugendhat, in 1930. In the 1920s, Mies was also associated with G magazine, and was architectural director of the Deutscher Werkbund, for which he organized the influential Weißenhof Siedlung prototype housing fair. He was also the last director of the Bashiuhaus, seeing it move to Berlin, and eventually be shut down by the state, precipitating his 1937 move to the USA. When Mies arrived in the USA, he was already a mature architect with an international reputation. Upon his arrival, he was made director of the Illinois Institute of Technology, on the condition that he design its new campus. While in the United States, Mies would revolutionize architectural technology, designing the first steel and glass curtain-wall building with 860–880 Lake Shore Drive, completed in 1952. Other significant works of the later part of his career include buildings in Chicago—the Farnsworth House, IBM Plaza, the Federal Building—the Seagram Building in New York, the TD Centre in Toronto, Westmount Square in Motréal, and the Neue Nationalgalerie in Berlin.

“Technology and Architecture” was a speech delivered at the Illinois Institute of Technology in 1950. In it, Mies presents technology as both method and things in inself. As a thing, technology has a history and form, and is itself generative of meaning. Thus technology, given the opportunity, transcends itself to become an expression of the spirit. In doing so, it expresses itself through the components of its

own construction. Technology is rooted in the past. It dominates the present and tends into the future. It is a real historical movement—one of the great movements which shape and represent their epoch. It can be compared only with the Classic discovery of man as a person, the Roman will to power, and the religious movement of the Middle Ages. Technology is far more than a method, it is a world in itself. As a method it is superior in almost every respect. But only where it is left to itself, as in gigantic structures of engineering, there technology reveals its true nature. There it is evident that it is not only a useful means, but that it is something, something in itself, something that has a meaning and a powerful form—so powerful in fact, that it is not easy to name it. Is that still technology or is it architecture? And that may be the reason why some people are convinced that architecture will be outmoded and replaced by technology. Such a conviction is not based on clear thinking. The opposite happens. Wherever technology reaches its real fulfilment, it transcends into architecture. It is true that architecture depends on facts, but its real field of activity is in the realm of significance.

I hope you will understand that architecture has nothing to do with the inventions of forms. It is not a playground for children, young or old. Architecture is the real battleground of the spirit. Architecture wrote the history of the epochs and gave them their names. Architecture depends on its time. It is the crystallization of its inner structure, the slow unfolding of its form. That is the reason why technology and architecture are so closely related. Our real hope is that they will grow together, that some day the one will be the expression of the other. Only then will we have an architecture worthy of its name: architecture as a true symbol of our time.

1970 Peter Cook

Experiment is an Inevitable

Peter Cook was born in Southend-on-Sea, England, in 1936 and studied architecture at the Bournemouth College of Art from 1953 to 1958 and also at the

Architectural Association in London from 1958 to 1960 under the guidance of Peter Smithson (see Team 10, 1954/1962). He is best known as a founder member of the experimental "antiarchitectural" practice Archigram, launched in 1961 while Cook was working in the offices of James Cubitt and Partners in London. Archigram actually began as a broadsheet newsletter ("architectural-telegram") and served as a vehicle to promote the group's futuristic ideas for high-technology housing and urban planning schemes through a seductive language of colorful and cartoon-like collages. In recongnition of their influence Archigram was awarded the prestigious Gold Medal of the Royal Institute of British Architects in 2002. Recently Cook has also carried out several innovative building projects including the blob-like Kunsthaus art gallery in Graz, Austria, designed in collaboration with Colin Fournier. He is currently Professor of Architecture and Chair of the Bartlett School of Architecture, University College London. Peter Cook has published ten books in total the earliest of which—*Architecture: Action and Plan* (1967)—is possibly his most influential. His third book *Experimental Architecture* (1970), from which this extract is taken, continues the "manifesto" approach of the earlier Archigram work. The text celebrates examples of the deployment of new materials and systems, and explores the potential of mass production and prefabrication in the construction industry (see Buckminster Fuller, 1929). This work is also inspired by the writings of Reyner Banham (see Banham, 1960, 1965) who subsequently came to be seen as the major "mouthpiece" of the Archigram group. Much of Cook's writing deals with "the struggle of architecture with technology that is the love-hate situation in today's second machine age."

The force of ideas and technologies

In this chapter we shall look at a series of substantive and emotive forces which are characteristic of the basic ambiguity of architecture, standing as it does between the practical and the idealistic. In this century there have been many motivations which it has seemed necessary to explode. A succession of logical steps have arisen from the aftermath of wars or from new attitudes about the need for certain types of

building. By considering five rather different motivations, which in many ways challenge one another and certainly challenge the attention of young architects, we can see that whichever one we follow we are gradually led to the point where they necessarily suggest far-reaching experiment; and though each experiment is of a different nature, each has been a necessary outcome of the situation. We can look at the logic of production and the strong connection between industrial processes and architecture, originating in Victorian pragmatism. (Also in the Victorian period we become aware of the beginnings of a much more open attitude towards the rightness of using new components to make up a building.) We are familiar with the castiron crockets and railings and the notion of repetition, but it is not until the 1920s that production-line building becomes a really serious proposition, and only then does it become an integral part of the philosophy of a new architecture. Either we can see this, cynically, as a theoretical alignment (i.e. in order to make a new architecture one goes straight to the most up-to-date process, deliberately assuming an anti-historical standpoint) or we can decide that, with a closer and necessary involvement with the economics of building, it becomes inevitable.

Against this materialist corner of the modern movement there is always the strong urge to find new philosophic value in any piece of space or design which is made. Those who propose to erect such stages of values are still taken seriously, even though they may be unable to qualify these values to a general public. Another similar attitude wishes to evaluate architecture according to preferred constituent elements. This viewpoint suggests that architecture, though an artifact, should arise from a series of basic physical consistencies. Though the imposition of such evaluation is similar to that of the previous group, its train of thought is different, as we shall see when we trace it through to the position of questioning. Another very strong thread running through the architecture of the last forty years is that where the material itself has provided an incentive for the discovery of new things. And finally we can see the most frequent aspiration that has been overlaid: that looking towards technology as a great force for a new architecture.

The logic of production

The force and logic of *production* has a practicality which appeals to certain designers. They turn towards an area which has to exist by its very rationale, feeling that if the *process* itself can be fed through this same rationale the resulting product will avoid many idiosyncrasies of peasant building. Once again there is a strong moralist thread to this approach, which would be vulnerable if it were not for the fact that the procedure comes so very close to success. Slowly the building process is being brought closer to something industrial and there are many arguments which suggest that this may be the only way in which building methods can survive. More frequently, too, the process has been looked at in greater and greater depth, so that one can no longer just regard a serious piece of production building from the point where the factory process starts; one has to go back into the area of consumer surveys. Gradually there has been the bleeding-in of these outside methods. Sequences have been looked at which did not arise in the traditional building industries. New technologies have been overlaid on the older ones, and the notion of prefabrication emerges as an in evitable technique. Prefabrication has been put forward by each successive generation as the solution to building illogicality and has gradually become one of the central approaches. But it was not until 1927 that it became philosophically respectable, when Walter Gropius evolved a system1 of panel construction which was not only sophisticated but contained a degree of flexibility with ubiquitousness which suggested that (whether you liked the style or not) previous ways of making houses were by definition archaic. Even at this time the whole business was tightly allied to the notion of modulation, which probably resulted from the desire to make clear the *demonstration* of a prefabricated building. It is interesting to see that later designers have felt the necessity to keep prefabricated sets of parts completely prefabricated, although from time to time there have been strong arguments for combining these elements with others that are in situ or additive or perhaps made by some other system of industrialization. The modular intention has

had to come through in spirit and the parts have had to at least appear to be consistent with one another. The prefabricators have rapidly become preoccupied with their own kind of delicacy: the notions of the magic part and the magic joint and a constant search for the *universal* joint have almost fetishist overtones. The suspicion that there must be some ultimate purity in the putting together of mechanical parts has its own rigorous appeal. It was in the 1940s, when Konrad Wachsmann started to produce beautiful prototypes, joints, and working parts, that production architecture reached its maturity. Wachsmann had his early training in the Germany of carpenters and industrial designers; and it is in Germany too that production architecture has consistently been closest to real industrial design. America's position in the development of prefabricated architecture has probably been more relaxed because of its ready use of timber in house building. The balloon frame itself is a very rational way of using this material and by the beginning of the twentieth century American 'ready-made' homes were displaying all but the most sophisticated prefabrication series (although, of course, they were wooden systems).

Almost echoing the old joke among architects that even the floor joist and the brick have to be modular, there is a gradual toughening up of the whole process. The real experimental work will probably now be done in the whole design approach to prefabrication and not just in the evolution of the fabric. As Chris Abel suggests in his article 'Ditching the Dinosaur Sanctuary', there is now the need to tune the machine to the consumer rather than rely on some formal straitjacket for prefabricated parts. We then find that system building, which is the definition of the kind of prefabrication with a consistent set of parts, is also sharing this shifting relationship to the consumer market. Philosophically it suggests a way of building which is much closer to the world of car or utensil production, implying that the house, or the large building, can similarly respond to the changing tastes and requirements of successive generations. Yet there is still a strong link with the building industry itself and more often industrialized building has operated some kind of rationalization of earlier, much less sequential methods of making buildings.

The situation which now can be called experimental will be strategic as well as operational; it will involve the design of the process, its economics and its marketing potential as much as the beauty of its detailing. It is curious then that, in looking for examples to study, we have to fall back on prefabricated parts as illustration of the rigorousness which is the main involvement. The clever assembly tends to involve the clever multi-directional joint and every investigation and experiment in this area reiterates this problem.

Wachsmann, in his early work, has probably brought the idea of fabric prefabrication further than anyone else: from its more primitive aspects through to the sophisticated package house system which he designed in 1942 with Walter Gropius, where there was the interface of a very rational panel system and a brilliant joint. He then moved on to experiments with the topology of constructional steelwork and subsequently to notions of minimal structure supporting maximal space. He is currently working on a building which has no immediately apparent support structure, which in fact beds its tension membrane (the roof) into the ground horizontally either side of the structure. While this, the Town Hall for California City, is not strictly concerned with prefabrication, it illustrates Wachsmann's movement towards an ultimate constructional gesture. Significantly, he has worked his way through the middle ground of the abstractly rational jointing theory and the putting-together of parts to a heroic gesture which is the whole building. Jean Prouvé is perhaps a more typical experimentalist in the field of prefabricated parts. His work, mostly in France, has often been in association with famous architects, as a developer-engineer. He has made panels, usually of steel, into intrinsically beautiful buildings by virtue of the finesse with which he is able to resolve the structural potential of pressed metal, its production and its jointing. Some of his buildings may at first appear undistinguished (and it is certainly very difficult for non-architects to appreciate their superiority over any other more normal panel-built buildings), but his experiments are significant for most practitioners. His work has been a continual ironing out of the problems of sheet material, of joint, and of the inherent problem of

the exposure of the joint. Most architects in northern countries have to spend much time and will-power on the problem of weathering and system-building has always had the problem of finding a material which does not absorb water or cannot easily be fractured. In technique, however, Prouvé's work can most clearly be read against car production and seen as a sophisticated working through of the idea of the component. Other metal buildings (from as early as the 1920s in Germany, through to the 1960s) have usually fallen into the category of panel and post construction. Either they attempt to produce a very small number of basic components with a resulting inadequacy in their jointing; or they admit that a larger number of basic components can be more specific, more subtle and more effective as a piece of practical structure. But some suffer a philosophical loss of face because of the admittance of non-purity. In his exhibition building at Grenoble, Prouvé presents a very cool skin which demonstrates that his panel system has almost reached the ubiquitousness of brick.

The developers of metal cast systems (such as the IBIS [Industrialized Building in Steel] project in the mid-1960s in England and the various projects for the international competition for steel houses, held in 1967) display a gradual constipation of ideas.

Perhaps only Herbert Ohl has evolved something as fundamental (in his garage enclosure system, which he has subsequently developed for other building types) as a component which could make almost any enclosure rather than something which is limited by the specific problems of a local condition.

It was, characteristically, Buckminster Fuller who, as far back as 1927, pointed a natural direction in which the production run could be significant to house building. His Wichita house is, in effect, a simple piece of corrugated sheet metal tacked around a central pole structure. This principle is developed through to his Dymaxion house where the components become more sophisticated and can be put together in very much the same way as current furniture kits, i.e., sequentially, but are not made up of parts which are all exactly the same. The Dymaxion bathroom, which failed only as a result of the politics of the construction industry, is the famous example of

large-scale building components being produced and marketed in the way that a car is. Fuller's actual technique by-passed the trap of the universal part and, consequently, the implications of his structures are much wider. They imply the possibility of treating buildings as durables which can be bought (and expended) because of their features. Still more important in this context is the fact that the components require each other to be produced industrially because it is actually more efficient and not just a nice idea. Another side of the commitment to the production run is the philosophy of the shed.

Its origins clearly lie in one tradition of architecture which attempts to create large spaces, but its development is much more specifically allied to the development of steel. The Victorian railway stations and the need for really large uninterrupted spaces to meet industrial and military requirements forced the consideration and (naturally enough for heroic reasons) the notion of the totally uninterrupted space, where the structure was only necessary to support the total envelope. The development of the space frame extended this idea and Wachsmann, in the 1940s and 1950s, made projects for space frame structures of gigantic dimensions and sophisticated profile. Particularly as a result of industrial needs and the necessary incorporation of services, good lighting and the alternative profiles of roofing (industrial north lights and ventilation), the idea of the space frame roof as the parent structure emerged as a very strong notion. In the last few years this has seen its most sophisticated and influential application in the work done by Ezra Ehrenkrantz and his team on the SCSD project. They have produced schools where a highly sophisticated steel roof system can carry on top of it all the air conditioning, lighting, electrics, and other services for an equally sophisticated type of school underneath. The implication of its use is that the school itself can be very freely planned and can be repeatedly changed and reorganized. The servicing hangs down and both it and the sub-structures of partitions (or for that matter, anything else) are located between the roof and the floor, always with reference to the top system. Reyner Banham has championed this as a significant step towards the totally ubiquitous structure for the

totally free changing building.

The two notions of the totally rational building component and the totally ubiquitous building must at some time come together. Even in the United States there is still most often a reliance upon the normal constructional system; and so far there has not really been a structure incorporating both ideas. Buckminster Fuller has clearly suggested the fusion in his notion of the dome made from equal parts (whether geodesic or not) and his extension of the housing ideas through to his standard of living package. And it is in Reyner Banham's 1965 article entitled 'A Home is not a House' that the notion of the envelope with the autonomous servicing package as the only internal feature is expressed.

Clearly the inspiration of production is central to the mid-twentieth century. Very few experimental architects will now be able to ignore the suggestion of ideals in production. Once again it is a question of definition, and a question of heroics, and we can see that production in the recent past has had too simplistic an aspiration. But its other implication, that of the ability of a rational product to give a member of the public precisely what he wants more quickly, cheaply, and successfully, is more interesting.

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