Awake!

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LIFE ON EARTH— design or coincidence?

Awake!®

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FEATURE ARTICLES

This planet abounds with life. But is life here on earth by design or coincidence? The series of articles listed below looks into both the plant and animal kingdoms. It also considers where we humans fit into this complex picture.

OTHER ITEMS

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"Awake!" is for the enlightenment of the entire family. It reports the news, tells about people in many lands, examines religion and science. But it does more. It probes beneath the surface and points to the real meaning behind current events, yet it stays politically neutral and does not exalt one race above another. It also shows how to cope with today's problems. Most importantly, "Awake!" builds confidence in the Creator's promise of a peaceful and secure new order within our generation.

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intelligent design or coincidence—which?

IS THERE intelligent design in the living things around us, or is everything a result of mere chance? There are two fields of thought on this question.

The proponents of the theory of existence by *chance,* or by the action of 'blind forces,' believe that life exists through the combination, by coincidence, of a countless number of events. This would mean that exactly the right chemicals would have to form themselves into the right quantities, under precisely the right conditions of temperature, moisture and other factors, all being maintained for the required length of time. Furthermore, such coincidental events would have to be continuous, or be repeated endless times, to begin and perpetuate life on earth.

Those who believe in *design* hold that there is intelligent purpose in life. Each life form is an important unit in the overall pattern, and there is an interdependency of all these forms. The variety of living things, the instincts that they display and the mechanisms or equipment that animals have, on the one hand, for hunting their food and, on the other hand, for survival of their species, exhibit an intelligence that is not their own—in fact, it is far above anything that even intelligent man could conceive of or devise.

Those who believe in coincidental existence of life acknowledge that the odds against such a chance happening are astronomical, yes, much more than astronomical. But, they say, every kind of combination could happen if enough time were allowed.

However, it is difficult to explain by the "coincidence" theory why haphazard changes are not observed in profusion today. A scientist takes progressive steps in his research, and he bases these on his own previous experiments or on the research of other scientists. He also proceeds according to what he knows of the laws governing natural things. He does not believe, for example, that the reactions of certain chemical combinations demonstrated yesterday will be different today, if the same conditions are maintained. So he has *faith* in what he calls the laws of chemistry. This faith contradicts the theory of coincidence or the operation of 'blind forces.'

Among living things on earth, both plant and animal, there is amazing complexity. Yet, in the provision for continuation of life—the great diversity of methods, all of them ingenious and perfectly effective —there are grounds for even greater amazement.

Why does every person owe it to himself to consider the evidence on this question of life by intelligent design or by chance? Well, a person's life pattern and his relations toward his fellowman are greatly affected by his view on the source

of life. Therefore, it is good to avoid taking a final position on the question until at least a small portion of the great mass of evidence is thoughtfully weighed. Then one can begin to arrive at the truth, which alone satisfies the reasoning mind. In the next two articles some of the evidence will be presented, from which the reader can draw the conclusion that his reasoning directs.

consider the evidence from plant life

PLANT life is the earth's greatest "factory," producing, according to one conservative estimate, 150 billion tons of carbohydrates (sugars) annually. This is more than 200 times the world's production of steel and cement. Plants constitute the food source for every animal and human on the face of the earth—a most bountiful provision. Along with the sugar that gives energy, plants also supply vitamins, minerals, medicines and bulk raw material for clothing, building, papermaking, dyes, paints and an almost innumerable host of other things beneficial to man.

We should be very glad that plant life in its myriad varieties appeared on the earth ahead of mankind, for it is essential to all animal and human life. The Bible describes vegetation as coming into existence prior to animals and depicts the Creator as indicating that he had a design in bringing forth vegetation first when he said to the first man and woman: "Here I have given to you all vegetation bearing seed which is on the surface of the whole earth and every tree on which there is the fruit of a tree bearing seed. To you let it serve as food. And to every wild beast of the earth and to every flying creature of the heavens and to everything moving upon the earth in which there is life as a soul I have given all green vegetation for food."—Gen. 1:29, 30.

The Role of Photosynthesis

Plant life includes the vegetable phytoplankton of the sea, basic to sustaining fish and other marine creatures. Vegetation, from grasses to trees, is the foundation of the "food chain" on the land. This is because no animal can manufacture its own food. But plants do this work. By the complex process of photosynthesis, not yet fully understood or duplicated by man, plants convert carbon dioxide, water and sunlight energy into carbohydrates and oxygen. Absorbing sun energy, the plant also utilizes minerals from the soil to make fat, protein, starch, vitamins and other products that provide foodstuffs for animal life. Animals and humans breathe oxygen that "fuels" the conversion of the carbohydrates to produce water and chemical energy, by which the other plant products are assimilated into their bodies.

Propagation of Plant Life

For plants to serve their indispensable purpose as the foundation of all animal life, they, or their fruit, must be eaten. Accordingly, plants must have a means of propagation in order to continue as a food source. They must die, decay and be renewed, reproducing their kind regularly and indefinitely. Do we find design in this arrangement? If so, it cannot be mere coincidence.

Consider the methods of propagation that vegetation employs. Plants usually produce seed prolifically. This is essential, for tons of seeds are eaten as food by insects, birds, other creatures, and by humans. Now, if only one seed, or a few, would be produced by a plant, such would be eaten and that species of plant would disappear. Also, seeds fall on many sorts of terrain and some never germinate. Unfavorable weather, fungus and other factors may prevent many seeds from sprouting. For this reason there must be liberal seed production. Therefore, it is not, as some have said, that "nature is very wasteful." Rather, it is prolific, and there appears to be design in this liberality. It is necessary that plants produce hundreds, even thousands, of seeds. Some trees yield millions of seeds per acre. Certainly we cannot say that such prodigious seed production does not serve a purpose. And does not purpose require design?

The seeds that are produced must also have strong germinating power, for some may have to survive months of winter, droughts or long periods of unfavorable conditions. Most seeds have remarkable germinating power, as much as 90-percent viability. A seed may be completely dry, its life being suspended. But in its inert condition it can withstand extremes of temperature, in many cases far below freezing, or almost as high as the boiling point of water (though not *in* water). Even after a lapse of years, seeds will come to life when placed in water or in moist soil. An Indian lotus sprouted and flowered after a dormancy in the seed state

Plants scatter their seeds in many ways—the dandelion sends forth wind-born "parachutes"

for 2,000 years, and cuttings and seeds from it have been sent to botanical institutions throughout the world.

Certainly we cannot say that plants realize the need for continuity of their species. What a monstrous coincidence—if it is a coincidence—that all the plants possess this provision! Could "blind," haphazard forces give such uniform direction for the benefit of all life on earth?

When we look into plant germination or reproduction, we find other complexities, without which the seed could never grow. One of these is the fact that seeds are provided with their own initial supply of food. Each seed contains carbohydrates and other substances that enable the germinating seed to survive long enough to grow roots and leaves so that it can reach maturity in the normal way.

Then there is a great variety of forms of propagation, so that each plant species manages to keep alive in its particular surroundings, according to its own particular nature. Certain plants can be divided or dissected, making two or more root systems, each of which can grow into a healthy plant. Others flourish from a mere cutting, a piece of the plant inserted in the soil. The exposed end of the cutting is able to grow its own roots. The leaves of some plants develop roots at cut places in the leaf. Others, such as potatoes, propagate through tubers; some plants grow from bulbs.

In the distribution or scattering of seeds there is beauty and "scientific" ingenuity. Trees and other vegetation are usually immobile, yet they must have their seeds scattered if they are to cover any appreciable area. Varied and most effective are the means used. The maple tree seed has wings by which the wind can carry it for long distances. Similarly the dandelion, by means of its own parachute-like attachment, virtually floats on the wind. The touch-me-not scatters fine seeds by an explosive discharge. The sandbur and some other seeds are carried on the fur of animals to other growing areas. Some berries and fruits are eaten by animals. *Their* seeds, however, are not digested, but are dispersed in the body waste of the animals.

Very ingenious is the seed dispersal method of the coconut, which transports its species to more remote shores, even to other islands and continents by sea. We might think that the coconut tree happens to grow in or near the seashore because it needs seawater, but this is not the case.

It actually needs fresh water. Hence, its roots are relatively short, only being long enough to reach the fresh water, which is lighter than seawater and so lies on top of the seawater in coastal regions. Yet to disperse its seed the seashore region is best, because the coconuts can float for great distances. By what manner of coincidence did the coconut palm make this unique arrangement? Is it reasonable to think that there was some kind of knowledge that directed this unusual combination of circumstances?

Fertilization Methods

Also, in the fertilization of flowering plants, what 'blind forces' would cause some plants to be sexually separated, so that the female plant would have to be fertilized by pollen from the male plant? And how would blind chance then arrange for a carrier of the pollen, especially when this carrier is at times more complex than the plant itself?

Though some pollen is carried by the wind, many plants have to enlist the cooperation of insects. This requires the plants to have food that the insects like, as well as to have a way of attracting them to the food. For this, plants employ a scent agreeable to the insect. Also, in some cases, brilliant colors seem to supply the attraction. Then in the male flower, the stamen containing the pollen must be near the food, so that the insect will brush against it and pick up some pollen in its body hair. In the female flower the pistil must be properly positioned to receive the pollen when the insect visits. Think of the complexity involved. The structure of the flowers, their scent and the proper nectar productivity must be just right. Even this would avail nothing if there were not the complete cooperation of the insect's instincts and habits, along with its need of and taste for certain food that only the flowers of its choice can supply.

Though such fertilization depends on so many factors, the abundant proliferation of these flowers testifies to the efficacy of their method. And this process is uniformly repeated billions of times over thousands of years. Could coincidence bring about all these requirements and then repeat them exactly, without damaging changes in the pattern over centuries of time?

The Magnitude of 'Earth's Greatest Factory'

In the food that it produces, plant life provides earth's richest storehouse of energy, which it obtains from the sun, the source of nearly all the energy used on earth. But consider how much farther this energy storage extends, as noted in *Photosynthesis and Related Products,* by Eugene I. Rabinowitch (Volume I, Interscience Publishers Incorporated):

> "The reduction of carbon dioxide by green plants is the largest single chemical process on earth. To make clearer what a yield of 10^{11} tons per year means, we may compare it with the total output of the chemical, metallurgical, and mining industries on earth, which is of the order of 10^{9} tons annually. Ninety per cent of this output is coal and oil, i.e., products due to photosynthesis in earlier ages. Similarly impressive is the comparison of the *energy* stored annually by the plants, with the energy available from other sources. The energy converted by photosynthesis is about one hundred times larger than the heat of combustion of all the coal mined on earth in the same period, and ten thousand times larger than the energy of falling water utilized in the whole world."

Considering Benefits from Plant Life Gives Rise to Serious Thought

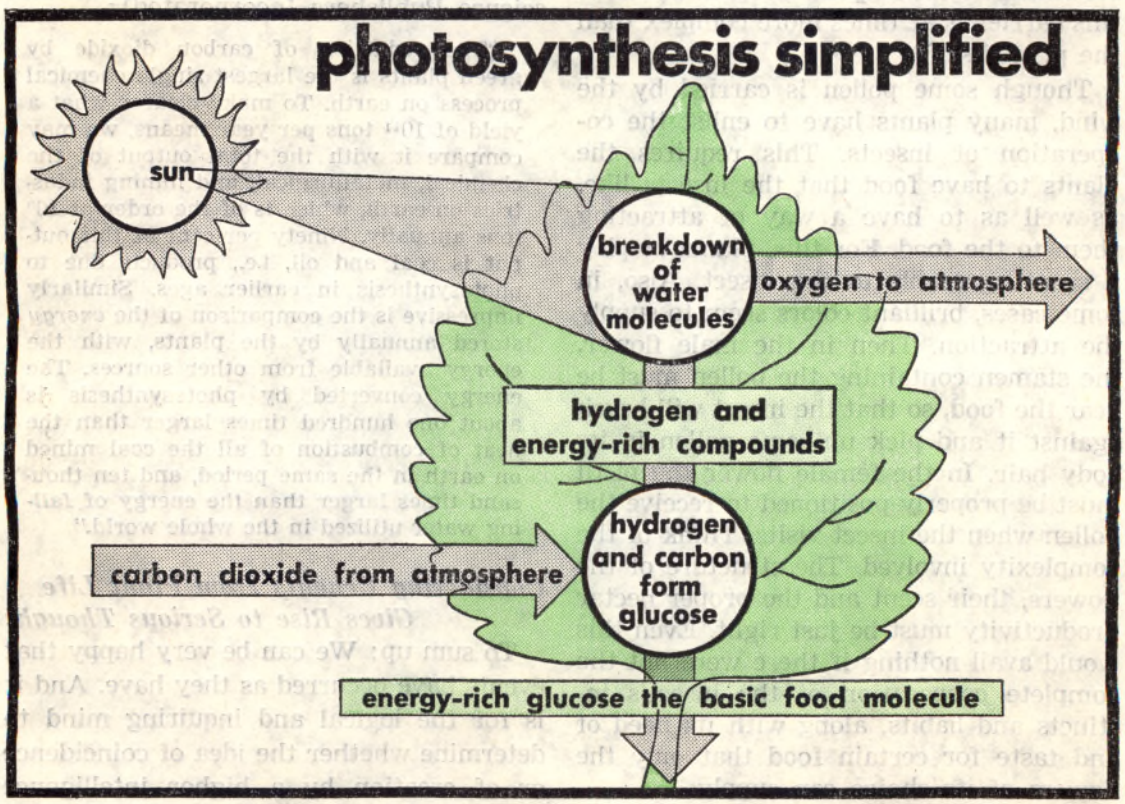
To sum up: We can be very happy that events have occurred as they have. And it is for the logical and inquiring mind to determine whether the idea of coincidence or of creation by a higher intelligence

brought it about. The fact that plant life was introduced before animal life is certainly vital. Was this deliberately or accidentally done? It may be argued that plant life would come before animal life, because animal life could not have existed without it. But upon close observation, plants are found to be extremely complex, not simple, and far, far from a "primeval" molecule. Moreover, plants differ greatly from animals and there is no explanation as to how any of them could by any means have evolved into the most primitive animal.

A fact that argues against blind chance as being able to ensure the continuation of life on earth lies in the ability of vegetation to absorb carbon dioxide from the atmosphere. It is certain that chance or 'blind forces' could not see ahead or provide for drastic changes that might take place in the environment. But a Creator who wanted life to continue on earth could do so. And this advance preparation is apparently what was made at the first in bringing plant life into existence. How so? Note the following example:

There has been considerable fear since the world's "industrial revolution" began that the production of carbon dioxide brought about by the combustion of fossil fuels would endanger life on earth, perhaps even make life impossible. But recent studies give a much brighter picture. *Science News* of April 19, 1975, reporting the findings of geologist Fred T. MacKenzie of Northwestern University, says:

> "As fossil fuels are burned, carbon dioxide is given off. By knowing how much fuel is burned worldwide, one can calculate



the expected amounts of carbon dioxide given off, and how much should be found hanging in the atmosphere. There is, however, one interesting problem with such calculations. Comparison of actual and expected CO_2 levels has revealed that most of it is 'missing.'

". . . The missing CO_2 is being incorporated into plants. The biomass of vegetation may have increased by 10 percent since the late 1800's, he says, when CO_2 emissions rose along with rising use of fossil fuels.

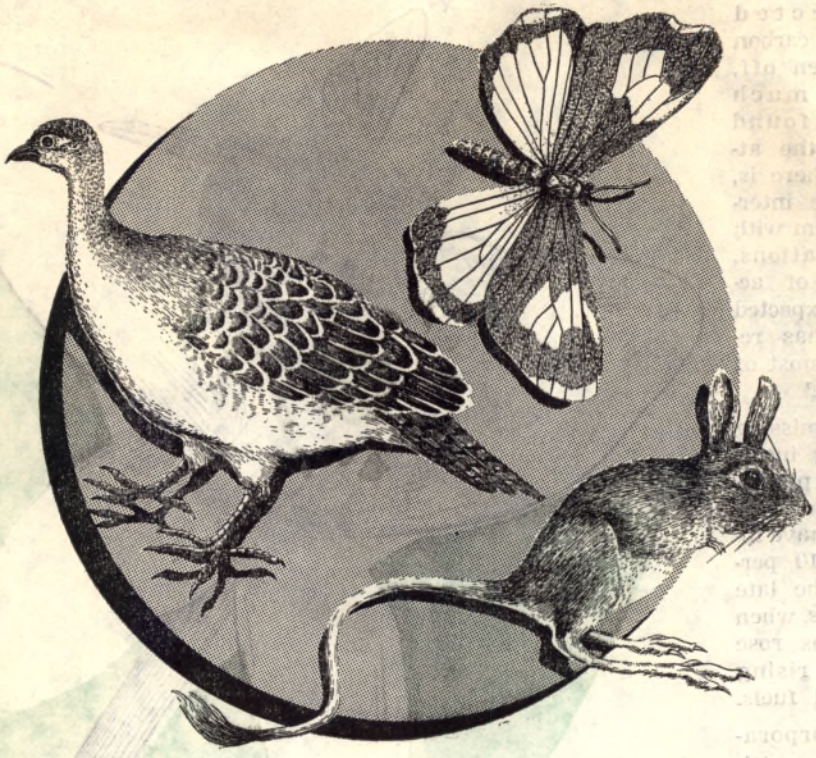
"The incorporation of CO_2 with available nutrients into plants may represent a global feedback mechanism that helps to prevent imbalances in the atmosphere, MacKenzie says."

What "blind force" could cause some plants to need insect help in fertilization, then supply the insects to carry the needed pollen?

To this it might be added that the ocean is a tremendous carbon dioxide reservoir. It absorbs or releases carbon dioxide as needed. Thus, along with the adjustability of the photosynthetic process, animal life is able to survive.

Who can dogmatically affirm that there is no Creator, who at the very establishment of the earth and life upon it, provided these "safety margins" to handle the situations that would arise?

Furthermore, it is most logical, and certainly essential, that there should be a provision to utilize the sun's energy. Vegetation does this for our benefit. What cooperation, that the sun, 93 million miles away, would provide just the right radiation and in the right quantity! Again, it is good that vegetation does not compete with animals and humans for food, but, rather, provides food. And plant life does not depend on man. For the most part, it promotes its own growth independent of animal life. The part that man plays even in cultivated plants is very minimal. He can do only a little to help—the growth itself is automatic and not even fully understood by man. Is it conceivable that blind chance or forces could arrange and bring about such intricacy, complexity and efficiency, whereas intelligent men can see, examine and study and still be ignorant of just how it all works?



consider the evidence from the animal world

THE animal world has to face a problem quite different from that encountered by the plant world. Plants are, for the most part, immobile. Their fixed location makes it essential that they have the adaptability to endure changing and inimical factors in the environment. Then, too, they have to manufacture food from inorganic materials.

Animals usually have great freedom of movement. They cannot make their food, but have to gather it or hunt for it. So they must employ different methods for hunting food and for the propagation and survival of their kind. And these methods vary with species, each being successful.

The bodily structure and the methods used by animals compare well with inventions and devices that man has designed for hunting, protection, and so forth. In fact, man has been able to improve the design of his inventions, such as airplanes, optical equipment, ships and other "advanced" equipment, by studying animal makeup and behavior. Animals are not credited with having the intelligence to devise these things, and certainly they are not able to form or change their own bodies to develop such things. From where, then, did the intelligence come?

Relation of Production of Young to Danger of Extinction

There is evidence that, among oviparous* animals, the number of eggs produced by an individual parent depends on the dangers to which the eggs or the newborn offspring are exposed. For example, the common oyster produces about 50 million eggs at one time. To practically all sea animals these eggs are a tasty dish. And they get opportunity to eat millions of them, for the eggs float for several days before attaching permanently to a site, where they develop to maturity. Though millions of eggs are eaten, enough survive so that the oyster population is maintained. Yet the oyster obviously has no ability to know what happens to the eggs. Similarly, though not as prolific as the oyster, many other sea animals that do not have other means of protecting their eggs lay a prodigious number of them.

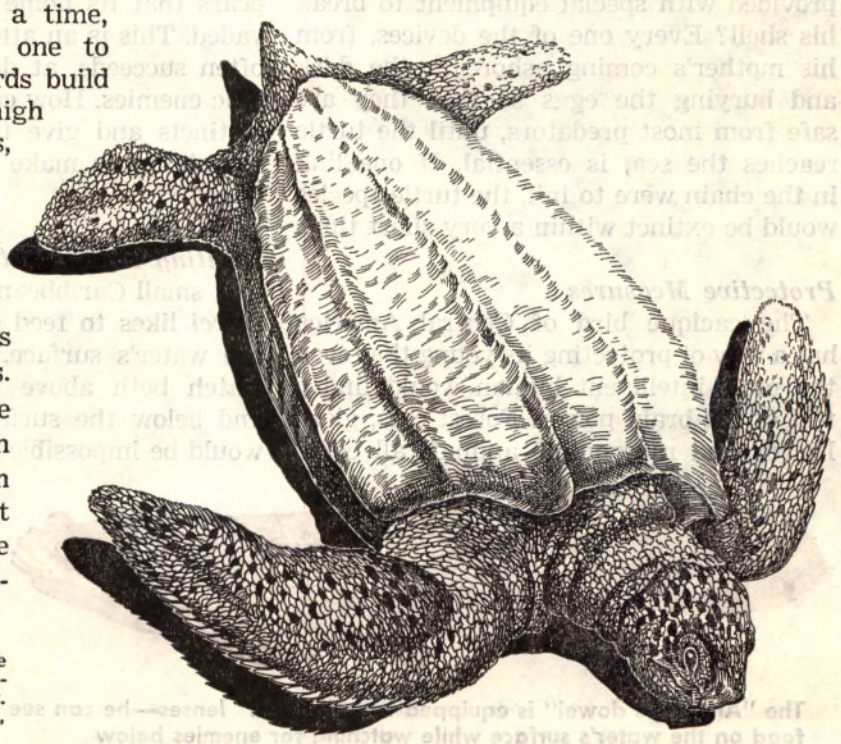
On the other hand, the golden eagle lays one to four eggs at a time, and the bald eagle one to three eggs. These birds build nests that are very high and difficult of access, and with their flying ability and their strong talons they can protect their nests. Therefore a great number of eggs would be superfluous.

With regard to the overall effect of such varied production on the part of different species of animals, the *Encyclopædia Britannica*† states:

> "Most animal populations are not, on the average, either increasing or decreasing markedly, and in such populations . . . the natality or reproductive rate equals the total mortality of eggs, young, and adults."

Some believers in evolution hold that the equality or balance between natality and mortality is an evolutionary mechanism to prevent overpopulation. Others argue from the viewpoint of natural selection. But when a person thinks of all the factors involved—climate, procreation, food supply, and others—can he really believe, on any logical basis, that nonintelligent forces assessed and directed this extremely complex situation with such eminent success?

An example of the intricacy in keeping a balance in the ecology is the turtle, which lays 100 or so eggs a year. The female comes ashore in the dark and digs holes in the sand, where she deposits her eggs and covers them. She then leaves them on their own. When hatching time arrives, the



* Producing eggs that are matured or hatched after being expelled from the body.

† 1976 edition, Macropædia, Volume 14, p. 827.

young turtle feels the urge to break out of his shell. For this escape he has a special hard point on his head by which he pierces the shell. Then he digs out of the sand and, without hesitation, flaps hurriedly toward the sea. On the way he is in great danger of being caught by predators, especially birds. Though he does not know this, he, nevertheless, urgently moves over all obstacles, and, if picked up and turned around, immediately turns back to get to the protection of his natural element, the sea. Even there he is in danger, and many baby turtles are eaten by fish. Birds and fish therefore are furnished a share of their food by the turtles, but a sufficient number survive to ensure the continuation of the turtle population.

Could blind chance direct *every* turtle so unerringly and determinedly toward the sea? How does he know that he must break out of his shell and his sandy incubation place? Did it just *happen* that he has been provided with special equipment to break his shell? Every one of the devices, from his mother's coming ashore in the dark and burying the eggs so that they are safe from most predators, until the turtle reaches the sea, is essential. If one link in the chain were to fail, the turtle species would be extinct within a very short time.

Protective Measures

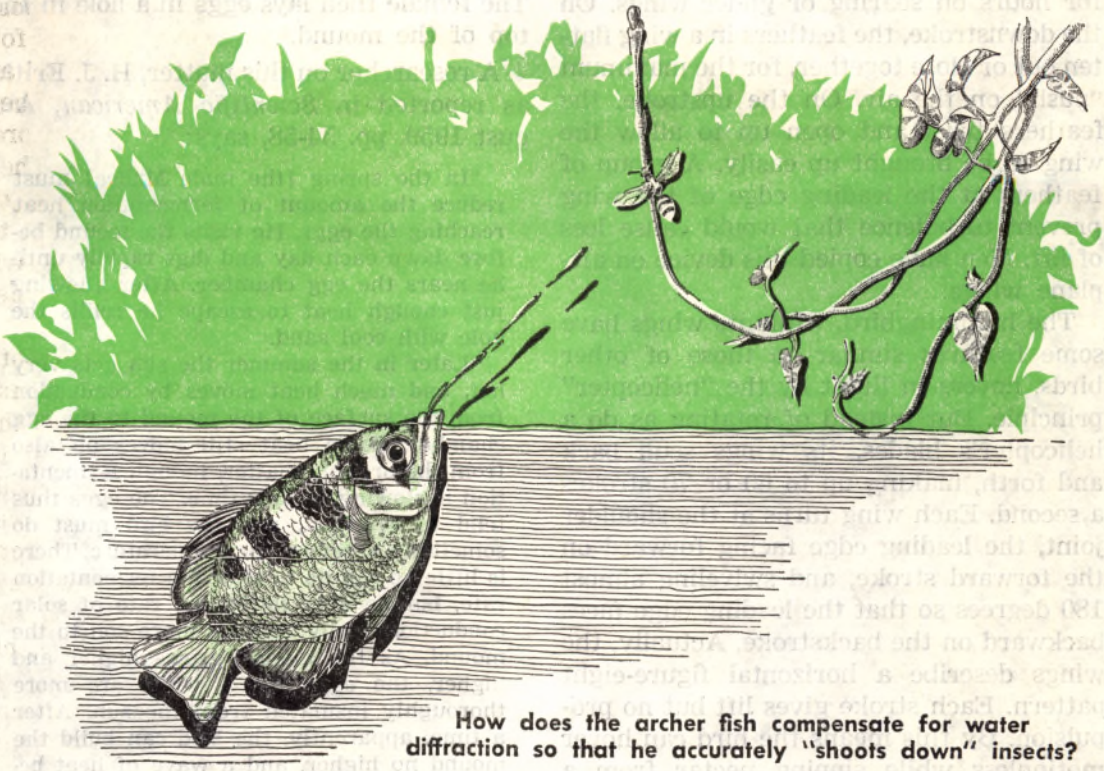
The cacique bird of Central America has a way of protecting its young that even the most intelligent human would find a test of his brain power. Forest cats, giant lizards and raccoonlike animals all could easily raid the caciques' nests, even those built high in the trees. But these birds foil their enemies by enlisting the help of an ally, without the ally's invitation. They build a colony of nests, often 50 or more, on a single branch of a large tree. They select a branch that holds a large nest of tropical wasps. The wasps do not seem to be annoyed by the nests, or by the activities of the birds, but woe to the intruder that tries to reach the nests!

The caterpillar of the West African moth has dangerous parasitic enemies. These parasites bore through the side of the caterpillar's cocoon and lay their eggs in the caterpillar's body. When the caterpillar is full grown, the parasitic larvae devour it. Then, as the parasitic larvae bore their way out of the cocoon, they spin tiny, frothlike cocoons for themselves. So the caterpillar, when spinning the cocoon initially, produces some frothy bubbles, which are attached to the outside, so that it appears that its home has already been invaded. This is an attempt, which no doubt often succeeds, at discouraging the parasitic enemies. How could chance direct the instincts and give this caterpillar's body the ability to make such a clever camouflage?

Hunting Equipment

A small Caribbean fish named *Anableps dowei* likes to feed on tidbits floating on the water's surface. He must be able to watch both above the surface for food and below the surface for enemies. This would be impossible for eyes with a single focus. But Anableps has "bifocals." By means of two pupils, he can see above water through the short dimension of the lens and under water through the long dimension of

The "Anableps dowei" is equipped with "bifocal" lenses—he can see food on the water's surface while watching for enemies below



How does the archer fish compensate for water diffraction so that he accurately "shoots down" insects?

the lens. By this means he takes care of the fact that light travels at different speeds through air and water. To keep the upper pupils moist, he ducks his head under water every few minutes.

Another fish that is equipped marvelously for overcoming the light diffraction property of water is the archer fish. Almost everyone has noticed that an object under water appears to be closer to the viewer from above the water, or that a pole stuck into the water at an angle looks bent. If one should aim an arrow or a gun at a small object in the water one would need to make quite a complex calculation to hit the object. The archer fish has this problem in reverse. He sees an insect on a hanging branch. He quickly projects his head, or just his mouth, out of the water and shoots down the insect as by "anti-aircraft" with a stream of water. In order to do this, he must take aim as he is coming to the surface of the water, compensating for the water's diffraction as he does so. Is this ability for instant mathematical computation built into the archer fish by design, or did a complex pattern of many factors just happen to imprint itself in some early archer fish's bodily mechanism and thereafter stay with all his descendants?

Bird Aerodynamics

Much study has been made of the aerodynamics of bird flight. Each kind of bird is equipped according to the part it plays in the ecological arrangement. Arctic terns fly 10,000 miles (16,000 kilometers) in their migratory flights. Such migratory birds are equipped for high speeds. Some birds' wings have a propellerlike action for forward flight. Some stay in the air

for hours on soaring or glider wings. On the downstroke, the feathers in a wing flatten out or close together, for the maximum "push" on the air. On the upstroke, the feathers twist and open up to allow the wing to be brought up easily. A group of feathers at the leading edge of the wing prevent turbulence that would cause loss of lift. Men have copied this device on airplane wings.

The hummingbird, while its wings have some features similar to those of other birds, hovers in flight by the "helicopter" principle. But instead of rotating as do a helicopter's blades, its wings scull back and forth, making up to 60 or 70 strokes a second. Each wing turns at the shoulder joint, the leading edge facing forward on the forward stroke, and swiveling almost 180 degrees so that the leading edge faces backward on the backstroke. Actually, the wings describe a horizontal figure-eight pattern. Each stroke gives lift but no propulsion. By this means the bird can hover motionless while sipping nectar from a flower.

A Marvel of Heat Regulation

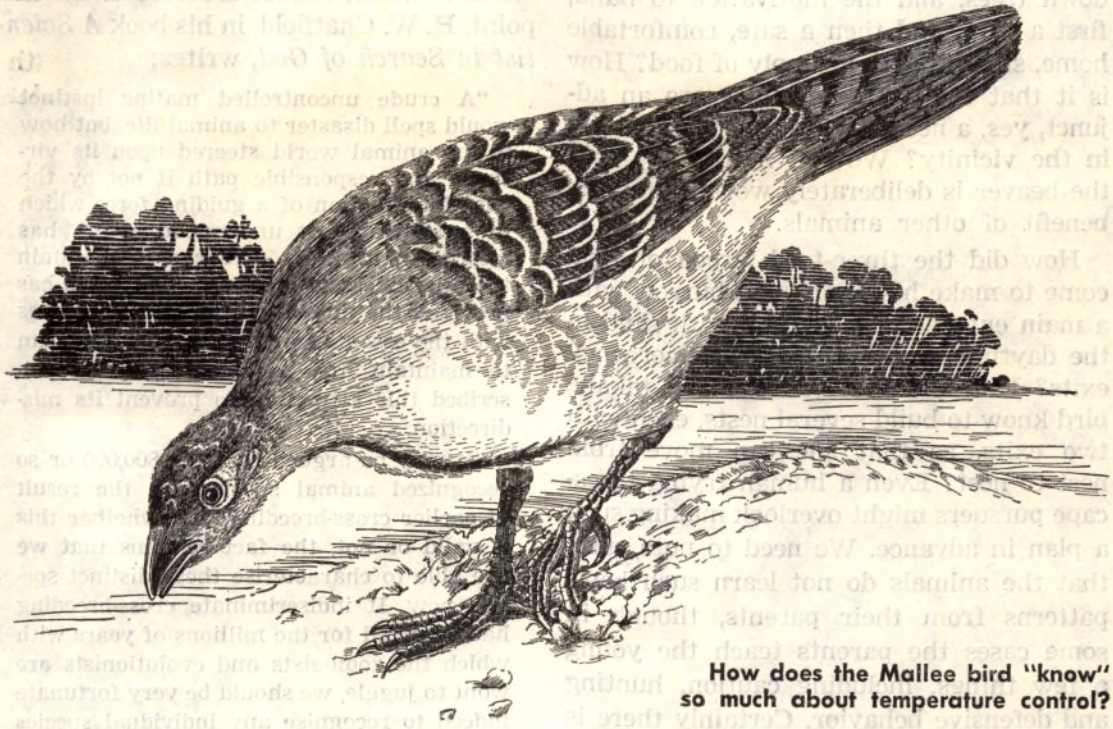
The Mallee fowl of Australia accomplishes a feat that humans would find practically impossible without the use of modern sophisticated devices—he makes his own incubator.

In the dry semidesert that is his home, where temperatures range from 17 degrees Fahrenheit (–8 degrees Celsius) to 115 degrees Fahrenheit (46 degrees Celsius), the male Mallee fowl buries leaves during the winter while they are still moist so that they will not dry out but will decay. In May, with the approach of winter, he digs a hole 15 feet (4.6 meters) in diameter and 3 to 4 feet (1 to 1.2 meters) deep, raking in the leaf litter from as far as 40 yards (36.5 meters) around. Then, in the cold of August, he covers the heap with soil up to two feet (.6 meter) thick. The female then lays eggs in a hole in the top of the mound.*

A researcher on this matter, H. J. Frith, as reported in *Scientific American,* August 1959, pp. 54-58, says:

> "In the spring [the male Mallee] must reduce the amount of fermentation heat reaching the eggs. He visits the mound before dawn each day and digs rapidly until he nears the egg chamber. After allowing just enough heat to escape he refills the hole with cool sand.
>
> "Later in the summer the sun gets very hot, and much heat moves by conduction from the surface of the mound to the egg chamber. Some heat still moves up also from the organic matter, though fermentation is slowing by this time. The eggs thus tend to overheat, and the bird must do something to reduce the temperature. There is little he can do to slow the fermentation rate, but he does lower the rate of solar conduction. Daily he adds more soil to the mound. As the mound grows higher and higher, the eggs for a while are more thoroughly insulated from the sun. After a time, apparently, the bird can build the mound no higher, and a wave of heat begins to go down toward the eggs again. Now the male bird visits the mound each week or so in the early morning, removes all the soil and scatters it in the cool morning air. When it is cool, he collects it and restores it to the mound. This is strenuous work, but effective in destroying the heat wave in the incubator. The temperature in the egg chamber remains steady at 92 degrees [33 degrees Celsius].
>
> "When autumn comes, the bird is faced with the opposite problem: falling temperature in the mound. The mound no longer generates fermentation heat, and the daily input of solar heat is declining. The bird now changes his activities to meet the challenge. Whereas he had scratched and scattered the sand to cool it in the early morning, often before dawn, he now comes to the mound each day at about 10 a.m., when the sun is shining on it. He digs almost all the soil away and spreads it out

* The female Mallee begins egglaying in mid-September, an egg every four to eight days, stopping in February or early March. The incubation period being seven weeks, newly hatched birds are periodically digging out of the mound—a true "assembly line" production.



How does the Mallee bird "know" so much about temperature control?

so that the mound resembles a large saucer, with the eggs only a few inches below the surface. This thin layer of soil, exposed to the midday sun, absorbs some heat, but not enough to maintain the temperature throughout the night. The saucer must be refilled with heated sand. Throughout the hottest part of the day the bird scratches over the sand he has removed from the mound, exposing all of it to the sun. As each layer gets hot, he returns it to the mound. He times the work so that the incubator is restored with layers of heated sand by 4 p.m., when the sun is getting low."

This researcher experimented by placing a heating element, operated by a 240-volt generator, in the mound, switching the heat on and off. This kept the male bird busy, but he managed to maintain the temperature at nearly 92 degrees.

What power of blind chance would let this bird know that a temperature of 92 degrees Fahrenheit (33 degrees Celsius) was absolutely essential to the incubation of the eggs, and, for that matter, why would this bird want to bring forth offspring at all? In the Mallee fowl's case it is more a matter of wonder, for when the young bird hatches and digs out of the mound, the parent birds leave it absolutely on its own. They give it no help at all. Yet the male bird has done some of the heaviest work under a blazing sun in order to incubate the eggs, as though the continuation of the Mallee bird species was important to the ecology, which it no doubt is.

Behavior That Is Evidence of Design

There are thousands of other features of animal behavior that can easily be understood as a result of design by a mastermind, but which require thousands of suppositions to justify the theory of chance or coincidence. For example, how did the beaver come to have a tail so suited to his "plastering" work, teeth that can cut

down trees, and the motivation to build, first a dam, and then a safe, comfortable home, stocked with a supply of food? How is it that the dams he builds are an adjunct, yes, a necessity, to other animal life in the vicinity? We can hardly say that the beaver is deliberately working for the benefit of other animals.

How did the three-toed jerboa of Asia come to make his permanent burrow with a main entrance, blocked up with sand in the daytime, and with several emergency exits? How did the New Zealand takahe bird know to build several nests, each with two exits, so that she can move from nest to nest? Even a human trying to escape pursuers might overlook making such a plan in advance. We need to note, also, that the animals do not learn such basic patterns from their parents, though in some cases the parents teach the young a few things, including caution, hunting and defensive behavior. Certainly there is no evidence that animals have built on the knowledge or discoveries of their ancestors so as to make advancement in learning, as humans do. Nevertheless, each animal has the behavior pattern necessary for survival of his species.

Design Evident in Differentiation of Kinds

Though many casual readers may not be aware of the fact, Charles Darwin did not believe in evolution in the absolute sense. In the conclusion of his work *Origin of Species,* he says: "There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one."

But there is no proof that the present great variety of widely differing "kinds" of animals on earth sprang from one, or only a few originally created forms, though many varieties have sprung from the "kinds," which cannot crossbreed. On this point, H. W. Chatfield, in his book *A Scientist in Search of God,* writes:

> "A crude uncontrolled mating instinct would spell disaster to animal life, but how is the animal world steered upon its virtuous and responsible path if not by the wise intervention of a guiding force which in some way, not understood by us, has interposed a safety embargo to maintain the orderliness of creation? This force has provided the animal world with two sexes with the essential attraction between them to maintain life, but has wisely circumscribed this attraction to prevent its misdirection.
>
> "It may be argued that the 800,000 or so recognized animal species are the result of earlier cross-breeding, and whether this is valid or not, the fact remains that we are able to characterise these distinct species now. If indiscriminate cross-breeding had occurred for the millions of years with which the zoologists and evolutionists are wont to juggle, we should be very fortunate indeed to recognise any individual species at all. The surprise is that after all this time we are able to separate animal life into sharp cut and readily identifiable species."—Pp. 138, 139.

As to life on earth, the Bible gives the answer that life is the product of a Master Designer, and not a product of chance. We read: "You are worthy, Jehovah, even our God, to receive the glory and the honor and the power, because you created all things, and because of your will they existed and were created."—Rev. 4:11.

And with regard to the reproduction of the different kinds, there is a law governing these, and we know that no law originates by chance or coincidence, but is the product of a lawmaker. This law is that every kind of vegetation and animal must reproduce "according to its kind." Would you say that the facts point to coincidence, or to design, in life on earth?—Gen. 1:11, 12, 21, 24, 25.

where does man fit in?

IN TURNING from the wonders and complexities of the animal world to look at human life, we find even greater wonders, for the human body, and particularly the human brain, is of immeasurably greater complexity. In fact, the gulf between the world of animals and that of mankind is much wider than that between insects and apes.

What constitutes this gap? It is found in the difference in makeup physically, mentally and spiritually. Mankind of all tribes and nations, everywhere, has a desire to worship. The most godless of governments have not been able to stamp out this trait. History reveals that humans are always devoted to a god in one sense or another. Even those claiming godlessness may worship the State, money, pleasure, some hero, or a sports star or an entertainment star, or they may set themselves up as "gods."

Man's Capacity for Spirituality

The reason is that man, of all living things on earth, has the ability to grasp and understand spiritual things and therefore also has morality, which animals do not possess. Truly, man can be said to have an inborn capacity for spirituality, and he has a need for this capacity to be filled. He appreciates art, beauty and fine qualities. He can, with God's help, produce the "fruitage of the spirit," which is "love, joy, peace, long-suffering, kindness, goodness, faith, mildness, self-control."—Gal. 5:22, 23.

Purpose, Reasoning, Awareness of Death

The Bible explains this superiority on the part of humankind by saying that man was made 'in God's image and likeness.' (Gen. 1:26, 27) He can reflect some of the qualities of God. Before Adam sinned he was completely, perfectly "God's image and glory." (1 Cor. 11:7) Not that he was God's image in appearance or form, but in the desirable attributes of love, reasoning, wisdom, compassion and mercy. He had these and other qualities of God in a measure suited to the place he occupied in God's creation and the obligations he had to fulfill.

Humans also have purpose in what they do, not as the animals, which do things instinctively. Animals accomplish a purpose, it is true, but not with their power of reason—it is through either instinct or a short-lived reaction from experience, to take care of an immediate objective. Take, for example, the Bible's description of ostrich behavior:

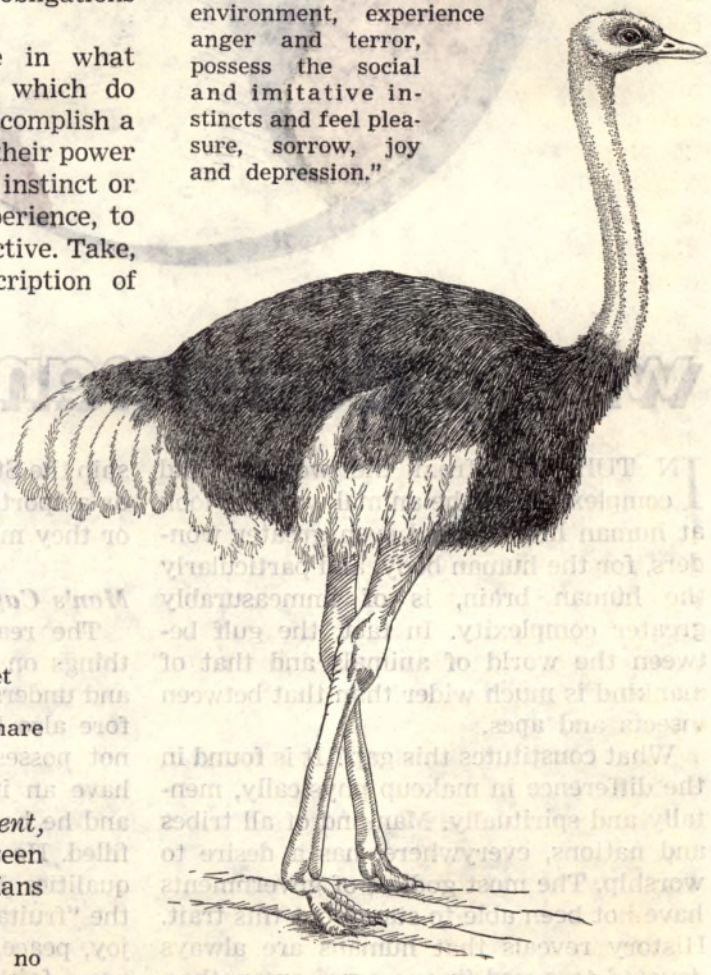
"She leaves her eggs to the earth itself
And in the dust she keeps them warm,
And she forgets that some foot may crush them
Or even a wild beast of the field may tread on them.
She does treat her sons roughly, as if not hers—
In vain is her toil because she has no dread.
For God has made her forget wisdom,
And he has not given her a share in understanding."
—Job 39:14-17.

In *Animals Are Quite Different*, "A Study of the Relation between Mankind and the Animals," Hans Bauer says:

"In contrast with mankind, no animal investigates the reasons for its actions. The animal, when left to its own devices simply seeks its own pleasure and comfort, nothing else. It is true that as a general rule it enjoys doing whatever is of service to its particular constitution. And in very many cases what is of service to it is the establishment of community living [as in the case of termites, ants, bees, birds, etc.]." —P. 204.

This is not to say that animals have no feelings. The above-quoted book says, on pages 24, 25:

"We have every reason to admit that animals, like human beings, can fear, hate, feel affection and disgust and homesickness, love their native environment, experience anger and terror, possess the social and imitative instincts and feel pleasure, sorrow, joy and depression."



But these emotions are generally only temporary and are not based on reason. For instance, a dog may stick with and fight for a master that treats him very harshly and that uses the dog to accomplish cruel and wicked purposes.

Only humans have a conception of the future, or plan for the future. They can look forward to time indefinite, to infinity. The Bible says of God's gift to man: "Even time indefinite he has put in their heart." (Eccl. 3:11) Animals, on the other hand, live only for the immediate moment or the immediate satisfaction of their desires. Man builds for the future. He uses the information and discoveries of history to plan his future, and most men would like to continue to pursue their purposes to time indefinite. Men "dread" the end of their lives. They know how life turns out—first, the aging process toward death, then the leaving of loved ones, being unable to carry out their projected works, the ceasing of all enjoyment and being soon forgotten. But animals do not have that "dread," just as the Bible says with regard to the ostrich.

Man Created to Live Forever and Given Dominion over Animals

The reason for this vast difference is that man was created, not to die, but to live forever on earth. The entering in of sin is what introduced death. (Rom. 5:12; 6:23) However, sin on the part of the man did not introduce sin and death into the animal world. Animals have no knowledge of sin nor a conscience to direct or convict them. Man's sinful treatment of animals has caused their death in some cases, even the extinction of some species. But geological discoveries prove that animals lived and died long before man appeared on the scene. Obviously, they always had a limited life-span. So whether they die and decay, or are consumed by other animals, it is a natural thing for them to pass off the scene. They have instincts that warn them of danger. This ensures survival of the species. But the animal does not know that fact.

Man was originally given dominion over the animals. (Gen. 1:28) This was because of his great mental superiority. He has often exercised this dominion in a cruel, destructive way. Nevertheless, he is their undoubted master. God reassured Noah after the flood: "A fear of you and a terror of you will continue upon every living creature of the earth and upon every flying creature of the heavens, upon everything that goes moving on the ground, and upon all the fishes of the sea. Into your hand they are now given."—Gen. 9:2.

In harmony with this statement, animals have a fear of man. Even wild beasts considered dangerous usually do all they can to avoid man. Rare is the animal that seeks out humans to attack them. Usually such a thing happens only when an animal is cornered and feels forced to attack. In fact, in the original perfect state animals were friends of man and were certainly put here for humankind's good. Only a very small percentage today can be considered harmful, and this is usually because of man's mistreatment of them, or his wasteful, polluting habits.

So man fits into the earthly scene as the one having dominion, and as the one for whom the entire intricate structure of life exists on earth. While the plant and animal creation glorifies God, man, by his created nature and makeup, if he establishes a good relationship with God, can bring Him far more glory. In answer to our question, we must say: No, life here on earth is not a product of mere chance. In all its counterbalancing forms, and especially in the masterpiece of earthly creation—man himself—the marvelous arrangement of living things extols the magnificence of the greatest of designers and builders—GOD.

Music MADE IN JAPAN

By "Awake!" correspondent in Japan

THE origins of traditional Japanese music reach back more than a thousand years. Included are classical or refined music, chamber music, theater, folk and festival music, as well as a host of vocal forms. This treasury of music was passed on from generation to generation without the help of musical scores.

Between the third and fifth centuries C.E., Buddhist missionary priests came to Japan to spread their views. The chants and background music associated with their religion gradually merged with the Shinto traditional music, forming a basis for nearly all native Japanese music.

By the seventh century this music of Japan developed into what became known as *Gagaku,* the classical (literally, "elegant") music. From *Gagaku,* which became the music of the imperial court, the secular use of instrumental music grew, as did theatrical music. Meanwhile, folk and festival music appeared, with its loud drumming and lively rhythm, contrasting sharply with the quiet music of *Gagaku.*

The Instruments

Today many instruments are employed in traditional Japanese music. The three most commonly heard are the *koto, shakuhachi* and *shamisen.*

The *koto,* imported from China around the ninth century, is a long wooden box-type instrument about six feet (1.8 meters) long and one foot (.3 meter) wide. With the instrument lying before him, the seated player plucks its 13 strings with a plectrum. A skillful player can produce music that pleasantly resembles that of the harp.

The Japanese bamboo flute, measuring about 21 inches (53 centimeters) in length, is called *shakuhachi.* This instrument has five finger holes, and a mouthpiece at the upper end. The player holds the *shakuhachi* vertically. By skillfully adjusting his lips to the mouthpiece at varying angles and moving his neck into different positions as he covers the holes with his fingers, the instrumentalist is able to produce three octaves of tones. The plaintive wail produced by this flute may generate feelings of vagueness and melancholy.

The *shamisen* has no counterpart among Western musical instruments. It came to Japan from China by way of Okinawa around the year 1560 C.E. But only the instrument is an import. The manner in which the *shamisen* is played, the kind of music produced with it and the construction of the instrument itself are strictly Japanese. It looks somewhat like a banjo, is made of wood covered with cat skin, and has three gut strings. The *shamisen* is played by striking the strings with a large plectrum.

When music is produced on the *shamisen,* the most important thing is not the sound of the instrument but the words for which the music provides the background. Without the words, the music has little meaning. It varies according to the meaning of the song. When words fail to express what is to be conveyed, such as the cold of falling snow or the trickling of a brook, the *shamisen* is used to "imitate" these things, and the story is told without words.

Appreciating the Music

What is the composite effect produced by Japanese instrumentalists? If you are listening for the first time, your reaction may be that you are hearing the same thing over and over again. It may seem that you are listening to a kind of melody, and yet there appear to be conflicting melodies. But there is something delightful about seeing the musicians perform. Their movements, posture and expressions all appear to be choreographed and in perfect harmony. Yes, in Japan, not just the music, but how it is played and how the performance looks to the observer are important.

Japanese music is very different from the music common in Western lands. This difference includes the scale, the rhythm and the sound. In Western orchestral music, sounds from the various instruments blend, producing harmony. But in Japanese music the individual instruments can be heard playing conflicting melodies. Nevertheless, together they create an aesthetic balance.

KOTO

Western Influence

In the last 100 years, the Western style of music has become the norm in Japan. Under Emperor Meiji's reform, music began to be taught in the schools, and it was the music of the West. In spite of this, there is no danger that the ancient traditional music will die out. Many Japanese people want to preserve the traditional music. Therefore, the various guilds that perpetuate this music and teach it continue to thrive.

Because music of the Western world has become so much a part of Japanese culture, one can find old Japanese songs written in Western notation and scored for the piano or guitar. Also, in the last century many new Japanese songs have been written according to the Western style. But it cannot be said that these are truly Western songs. Rather, the Japanese simply have used a medium to enrich their own musical heritage. The development is music with a distinct Japanese flavor, though scored and played in the Western style.

SHAKUHACHI

If you are not an Oriental, this brief look at the music of Japan may help you to appreciate why it is so different from Western music. Should you have the opportunity to hear it, be observant and listen carefully. You may, in time, come to enjoy music made in Japan.

our FAITH-TESTING tragedy

HE WAS our firstborn. We named him Micah Nathanael, not only because of the ageless beauty of the names, but also because of their meanings. Micah means "who is like Jehovah?" and Nathanael means "given of God."

We had waited with such anticipation. And now we were actually able to hold him in our arms and look into his deep-blue eyes. On leaving the hospital the Sunday night that he was born, I could feel the pride that all new fathers must feel. I had no hint of the great trial just ahead.

Early Monday afternoon I was startled by a phone call from my wife. Could I please come to the hospital right away? "Sure, but is everything all right?" She replied "Yes," but her voice didn't sound convincing.

Once there, immediately I could see from my wife's face that something was dreadfully wrong. Holding back tears, she told me that Micah had a temperature of 103 degrees Fahrenheit (39.4 degrees Celsius). I comforted her by telling her that everything would be fine. Still, she could sense my worry.

I went from her room to the nursery to see Micah. But what was happening? His body lay limp! He was not breathing! Our doctor was working frantically over Micah, while the head nurse was scurrying about gathering equipment. A loudspeaker was calling for emergency help from others.

A nurse led me back to my wife to wait out the crisis. At last, we learned that Micah was alive. When his condition stabilized (about an hour later), he was transferred to the intensive-care nursery of a nearby university's hospital. Micah had looked so healthy. Yet, now he was so sick. We kept asking ourselves, "Why?"

The first news that we received was not very good. He was hemorrhaging under his skull and this bleeding was causing periodic convulsions and breathing failure. It seems that during a stressful moment in delivery a baby is susceptible to rupturing a blood vessel under the skull. Although such an occurrence is rare, Micah had experienced this. We were reassured that he was receiving treatment and that further tests were being made. More shocking information would come later.

About 9 p.m. we received word that Micah had meningitis, which is a disease of the brain and spinal column. Also, his red blood cell count was dangerously low. The doctors wanted to administer blood transfusions. Being Jehovah's Witnesses, my wife and I have deep respect for God's law regarding blood. (Acts 15:19, 20, 28, 29) Earlier we had informed the university's doctors of our position—no blood transfusions. They assured us that our beliefs would be respected.

But now they wanted permission to give Micah blood. My wife and I said No again and again. Finally, they said they would respect our belief and use an alternative procedure. Yet, they warned that should Micah's blood condition worsen, they would seek a court order to administer blood. As we had been doing all day long, we continued praying to Jehovah God for guidance and strength.

Tuesday morning our doctor informed us that the infant mortality rate for newborn babies with meningitis is about 90 percent. We were told that, even if Micah lived, there would be some mental retardation. We began trying to prepare ourselves for his mental impairment or death.

From Tuesday through Thursday we waited. The hemorrhaging had been stopped, but repeated spinal taps continued to show meningitis bacteria in the spinal fluid. These bacteria would continue to destroy brain cells as long as they were present.

Although the doctors were not very optimistic about Micah's recovery, they did note that his red cell count had returned to normal—and without blood transfusion. For this my wife and I were grateful. But what continued to bother us was, "How did Micah get meningitis?"

It was explained to us that during the last few days of pregnancy my wife must have developed a pinhole leak in the watery sac that surrounds the baby in the womb. There are bacteria in the birth canal of each mother, just as there are many germs all over everyone's body. In *extremely rare* cases, when a leak occurs, the bacteria work their way up inside the sac, infecting the baby. We were assured that because the infection was bacterial and not viral my wife was not infected. She could continue having children with little chance of this ever happening again. But we kept praying for Micah.

Later Thursday afternoon the doctors told us that a brain scan showed that Micah had suffered severe brain damage. They requested that we meet with them the next afternoon to "discuss Micah's future." My wife and I knew what this meant. Micah was going to die.

It was no small shock. We kept feeling that we were going through our 'greatest tribulation.' All of it seemed unreal—like something one would see on television. Throughout the week we had periodically given ourselves to weeping. We had no appetite.

Friday afternoon we went to the hospital determined to let Micah die with dignity, if death was inevitable. At the meeting, we were told that two EEG (electroencephalogram) tests had been given our baby. They had shown total brain damage—no activity. We agreed to the removing of Micah from the respirator. Once this was done, he never drew another breath. He had lived only five days.

With Micah's death, it seemed our tears were over. We had wept for his suffering, but now he would suffer no more. We had also wept for ourselves, but now tears would not bring him back. Death was a release—for Micah and for us.

Throughout the faith-testing ordeal our friends and relatives actually claimed to be strengthened by watching us. Yet, it was difficult to communicate to others the extent of our pain and, at the same time, the degree of comfort from Jehovah's holy spirit. Our strength came from Jehovah —every last ounce of it!

In talking to others about God's kingdom, my wife and I had spoken many times about the resurrection hope for the dead and the prospect of everlasting life in the coming new system of things. How often we had quoted Jesus! He said: "Do not marvel at this, because the hour *is* coming in which all those in the memorial tombs will hear his voice and come out." —John 5:28, 29; Rev. 21:1-4.

Throughout Micah's illness we were clearly confronted with a choice: Either manifest faith in these beliefs or forsake them all. It was our complete faith in Micah's future resurrection that sustained us. This loving provision from Jehovah God, the Creator, is what gives us hope of seeing our little boy again—in a system free of sickness, suffering and death. —*Contributed.*

GOLD out of rocks

By "Awake!" correspondent in Zaire

GOLD, known as a "noble" metal, has long been highly prized. Its malleability, its resistance to the corrosion of time and its beautiful yellow luster have made gold a favorite for fine jewelry and other ornamentation. Because of its rarity, gold is still treasured the world over, even though it is no longer an international monetary standard as in the past.

Small nuggets or grains of this metal may be found in the sand of certain riverbeds. This is known as alluvial gold. Though containing between 2 and 3 percent silver, alluvial gold has the characteristic yellow color. Since it is not physically attached to the grains of sand that surround it, this fine metal may easily be obtained by means of gravity separation. How is this possible? Gold is over 19 times as heavy as water and about seven times as heavy as sand. Therefore, if a mixture of gold and sand passes through a flowing stream, the sand is carried away but the heavy gold falls to the bottom.

Gold may also be locked in seams of rock, often far underground. Today, in the heart of Africa, man is obliged to dig deep to find narrow veins of quartz containing minute grains of gold alloyed with a low percentage of silver or mixed with sulfides. Five tons of ore may contain but one ounce of gold! How, then, is this small quantity of gold extracted?

Extraction

The first stage in mining is to break the rock mass into transportable chunks. This is done with special pneumatic drills and dynamite. Since the quartz vein is sometimes only a foot or two (30 to 60 centimeters) thick, a tremendous amount of material surrounding the vein also has to be broken up to get out the gold-bearing quartz. This ore is then loaded into small cars running on narrow-gauge rails and is transported to the mill, where the gold is separated from the quartz and the sulfides.

The ore cars are unloaded into a huge hopper with a capacity of more than 400 tons of rock. From the opening at the bottom of this great concrete pit, the ore drops into a crusher that reduces the size of the rock. Often two or more crushers work in

succession, gradually reducing the size of the rock.

The crushed ore is now put into a ball mill. What is that? From the outside all that one can see is a huge cylinder or drum rotating horizontally with a thunderous din. Inside, the mill is perhaps one third full of steel balls weighing several tons. As the mill rotates, the ore is gradually pulverized under the tremendous pressure of the steel balls as they roll over the rock. After many hours of grinding in the ball mill, the ore particles are reduced to the size of sand.

The larger particles of gold have by now been unlocked from the rock that held them. These particles can now be separated by such methods as jigging. A jig is a machine that causes a stream of water to move up and down. The current of water carries the sand mixed with gold over the bed of the jig. On the upward pulse of the water in the jig, the "bed," composed of small steel balls or small pebbles, is lifted on the rising water and opens out. This allows the particles of gold, being denser than either the water or the jig "bed," to drop into a "hutch," or collecting compartment, below. Particles of sand without any gold pass over the jig and remain suspended in the water, to be carried away by the current. The sulfides, however, are also collected by the jig. They have a density somewhere between that of the sand (quartz) and gold and may still contain minute particles of gold. The portion of the ore collected by the jig, consisting of particles of now liberated gold, sulfides and a little sand, is called the "jig concentrate." This concentrate still is not marketable but must be submitted to a process known as "amalgamation."

This is accomplished with mercury. Though a metal, mercury is a liquid that absorbs gold, forming what is called an "amalgam." But the mercury does not form amalgams with quartz or sulfide. Therefore, if the jig concentrate is mixed with mercury under the right conditions, the mercury extracts the gold and leaves the rest. Such amalgamation accounts for the extraction of over 60 percent of the total gold in the ore.

What about the rest of the gold that is locked *inside* the sulfides? Gold particles have to be large enough to be absorbed by mercury. However, the particles of gold found in the sulfides are very, very small, perhaps only a few microns in diameter. A micron is one millionth of a meter, or about one five-hundredth of the diameter of the period at the end of this sentence. Think of that! Since this gold escapes amalgamation, the precious sulfides must be ground very fine and then the gold can be dissolved.

The deadly poison cyanide, when in very dilute solution, has the amazing ability to dissolve gold. For this reason the finely ground sulfides are stirred in huge vats for a day or two in a solution containing cyanide and a bit of lime. When the gold dissolves, the stirring is stopped and the now barren sulfides are allowed to settle. The solution full of gold, known as "pregnant" solution, is decanted or siphoned off. Then, to recover the gold in a solid state,

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zinc dust is added. This precipitates the gold from the solution.

By means of amalgamation and cyanidation over 90 percent of the gold contained in the original ore is extracted. But at this stage the extracted substance does not even look like gold. The gold-mercury amalgam is in the form of silver-gray balls and the zinc-gold precipitate is a brownish-black sludge. Hence, both of these substances have to be sent from the concentrating mill to the chemical plant for treatment.

Final Microns Recovered

How is the transformation of the gold-mercury amalgam accomplished? Mercury boils at 357 degrees Celsius (675 degrees Fahrenheit), whereas gold does not even melt until it reaches 1,063 degrees Celsius (1,945 degrees Fahrenheit). So the first step in treating the amalgam is distillation. The amalgam is put into an iron retort fitted with an outlet pipe that is cooled by running water. The retort is heated to the point where the mercury boils off, leaving the gold behind. The mercury, however, is collected and reused.

The gold-zinc precipitate has to be handled differently. It is treated with acid, which dissolves the zinc and thus frees the gold. Then the gold residue is washed and dried.

At this point gold from both concentrates is ready for melting down, along with any gold that may have been retained on top of the jig "bed." The gold is put into large graphite crucibles, along with various chemicals to facilitate the melting and also the formation of slag. These crucibles are heated in an oil-fired open-hearth refractory furnace. The liquefied gold is stirred and then poured quickly into cast-iron ingot molds. The impurities, being lighter than the precious metal, float to the surface as a scum that solidifies into a crust known as slag. After cooling a few minutes, the slag is hammered off and the ingots are scrubbed clean. Having been analyzed for purity or fineness, the ingots are stamped with a number and packed for shipping.

After going to such tremendous efforts to wrest a few ounces of gold from many tons of ore, it is little wonder that this yellow metal carries a high price tag. And what a paradox that much of it is then hidden away in bank vaults, where it can be of no direct use or service to man!

"Drownproofing"

EACH year thousands of people lose their lives by drowning. Some swimming experts claim that 95 percent of these drownings could be avoided by learning simple techniques of floating. One newer method is called "drownproofing." It involves teaching both swimmers and non-swimmers how to float in all types of water conditions.

Dr. Reagh Wetmore, a swimming director at Boston University, states: "Treading water, floating on your back, and doing the crawl stroke can lead to panic and exhaustion." The "drownproofing" method, instead, calls for the person to float in an upright position, with the head down just inches beneath the water level, and with arms and legs in a dangling position. Then, as air is needed periodically, the person can lift his head and propel the body upward by a modified version of the breast stroke. This method is said to take advantage of the body's natural buoyancy, conserving energy and controlling breathing.

The Bible's View

"Once Saved, Always Saved" —How Certain?

THE "Son of Sam" killer terrorized New York city residents for more than a year, killing six random victims and wounding several others. Yet the person accused of the crime reportedly had been "saved" at a church meeting about four years before his reign of terror began.

A former army friend of the suspect who had invited him to the church meeting relates that the new convert "came up to me grinning and laughing and saying, 'Man, I'm saved.' Then we came back that same day for the evening service and he went forward again at the invitation [to accept Christ]. He told me afterward that he just wanted to make sure it [being "saved"] took."

Upon hearing the charges against this former member of her church, another member told the Associated Press: "I'm just thankful he was saved." Why? She declared: "The Bible says, once saved, always saved."—New York *Post*, August 25, 1977, p. 2.

Does the Bible actually say, "Once saved, always saved"? No, it does not use those words in any specific text, but many sincere people believe that this is what the Bible teaches. And it is true that a number of Bible texts indicate that the basis for salvation is not one's works, but, rather, faith in Jesus Christ, together with God's "grace" and mercy. (Eph. 2:8, 9; 2 Tim. 1:9; Titus 3:4, 5) Additionally, Jesus himself said that "he that believeth on the Son *hath* everlasting life."—John 3:36, *Authorized Version* (*AV*); 1 John 5:13.

From such references it is often reasoned that if one *'has* everlasting life,' he actually possesses it permanently; it cannot be lost, or, as many would have it: "Once saved, always saved." However, does this understanding fully express the Scriptural view of gaining everlasting life?

Well, Christians concerned about their salvation may also wish to consider Jesus' declaration that "he that endureth *to the end* shall be saved." (Matt. 10:22; 24:12, 13; Mark 13:13, *AV*) And the apostle Paul comments similarly: "For we are made partakers of Christ, if we hold the beginning of our confidence stedfast *unto the end.*" —Heb. 3:14, *AV*.

How are we to reconcile these seeming disparities? Surely these servants of God were not contradicting themselves. Rather, were they not merely expressing the same understanding from different viewpoints? The apostle Paul provides the key to harmonizing these viewpoints.

Time and again Paul likens the Christian's course to a "race" that must be run to the finish. "Let us run with patience the race that is set before us," he urged the Hebrews. (12:1, *AV*) To enter the race, sinners must take the steps necessary for salvation: hearing and accepting the Word of God, believing in Jesus Christ and his ransom sacrifice, repenting of their sins and being baptized. In this way, they get saved "from this crooked generation," as Peter exhorted those gathered at Pentecost. Unbelievers are outside the race, having failed to enter by getting "saved."—Acts 2:37-40, *Revised Standard Version* (*RSV*); 16:31-33; Rom. 10:13, 14.

Once entered in the race by being "saved," a Christian takes "hold of the life which is life indeed." But is it possible to lose that grip on life? Paul answers with this question: "Do you not know that in a race all the runners compete, but only one receives the prize?" In the Christian race, Paul indicates the "one" who receives the prize is anyone who *finishes* the race. Therefore, Paul urges, "So run that you may obtain it." Then, using himself as an example to make the point of his illustration, he continues: "I pommel my body and subdue it, lest after preaching to others I myself should be disqualified." —1 Tim. 6:19; 1 Cor. 9:24-27, *RSV*.

Evidently the apostle, who surely was a "saved" Christian, believed that even he could be "disqualified" from the race. Yet as long as he continued to 'run that he might obtain' the prize, thus remaining in the race, salvation was assured. This is why Christians who remain in the race can be said to *'have* everlasting life.' But if they should ever quit the race, they are "disqualified," losing their hold on everlasting life.

Hence, Paul follows up his remarks on the Christian's race by cautioning about the danger of overconfidence. Using the example of the Israelites who were saved through the Red Sea, yet fell to wrongdoing in the wilderness, he warned: "We ["saved" Christians] must not put the Lord to the test." Then, driving his point home, he declared: "Let any one who thinks that he stands take heed lest he fall." Yes, it could happen, even to "saved" ones!—1 Cor. 10:1-12, *RSV*.

This is why, throughout his writings, Paul consistently emphasized his own need to stay in the race. For example, of his hoped-for reward of the resurrection, he said: "I do not consider that I have made it my own; but one thing I do, forgetting what lies behind and straining forward to what lies ahead, I press on toward the goal for the prize of the upward call of God in Christ Jesus." It was only after Paul neared the end of his life that he wrote: "I have finished the race, I have kept the faith." At this point in his life, he could finally say with confidence: "Henceforth there is laid up for me the crown of righteousness, which the Lord, the righteous judge, will award me on that Day."—Phil. 3:11-14; 2 Tim. 4:6-8, *RSV*.

Paul's view of his own salvation, then, is consistent with Jesus' comments mentioned earlier about 'enduring to the end' to be saved.—See also Revelation 2:10; 3:11, 12, *AV*.

The foregoing helps us to see why Paul repeatedly entreated "saved" Christians to be on guard. Their everlasting salvation was still at stake. Addressing the obviously "saved" Hebrew Christians who had been "illuminated" and who had "endured a great fight of afflictions," he warns: "If we sin willfully after that we have received the knowledge of the truth, there remaineth no more sacrifice for sins." The sacrificial benefits that "saved" such persons, then, can be lost. Why? Because such a person "hath trodden under foot the Son of God, and hath counted the blood of the covenant, wherewith he was sanctified, an unholy thing, and hath done despite unto [outraged, *RSV*] the Spirit of grace." —Heb. 10:26-32, *AV*.

Yes, Christians who truly appreciate the salvation provided through Christ and God's grace will not be overconfident. They will strive to remain in the race like Paul and the other early Christians, whom he encouraged to "work out [their] own salvation with fear and trembling."—Phil. 2:12, *AV*.

Watching the World

Teen-Age Surgeons

◈ Sterilization is a means often used in efforts to curb the rapidly growing population of Bangladesh. Now, according to a volunteer nurse who worked there, even that country's teen-agers are successfully sterilizing women by means of tubal ligation on a wide scale. She writes in England's *Nursing Mirror* that, although some of the youths cannot read or write, they are trained to sever and tie a woman's fallopian tubes while she is undergoing abdominal surgery and is under local anesthesia.

Heavy Breathing

◈ "All residents of Mexico City," says the local director of Forensic Medical Services, "have pulmonary problems due to the high level of air pollution." Autopsies of 7,500 cadavers in 1977 revealed this fact. The city's 60,000 industries and 1.5 million automobiles are said to pour 650 tons of pollution into the local atmosphere each day. Fumes from many 20- to 30-year-old cars are responsible for much of the pollution.

Fat on Foot?

◈ According to the National Center for Health Statistics, the average American man weighs four pounds more than he did in a survey taken 10 years before the most recent one. The average American woman weighs a pound more. Men are said to be an average of 20 to 30 pounds overweight and women an average of 15 to 30 pounds overweight in various age categories. Heart disease, diabetes and some respiratory disorders are often the consequences of extra weight.

Fastest Train

◈ The Japanese National Railway has completed what is said to be "the world's first successful test run of a linear motor [rail] car," says Tokyo's *Daily Yomiuri*. By magnetic repulsion, the train is floated above and propelled along a single rail. Since there is no track friction, much higher speeds are attainable, up to about 500 kilometers (300 miles) per hour, whereas conventional trains are limited to about 300 kilometers (180 miles) per hour. It is hoped that the speedy train will be competitive in cost with conventional air and rail transport.

Music or Madness?

◈ A 19-year-old Japanese girl recently was crushed to death when 2,000 screaming fans rushed toward a British rock group performing in Sapporo. Others were injured. "I saw some people about 17 to 18 rows from the front toppled over like dominoes," said a guard.

Unusual Birth

◈ A healthy baby was recently born in Amarillo, Texas (U.S.A.), to a mother who was unconscious during the last three weeks of pregnancy. The woman had suffered a heart attack, which left her in a coma with severe brain damage, according to doctors. She was kept alive in intensive care after the attack.

Mining the Sea

◈ In what is claimed to be a first, Japanese scientists report success this year in extracting lithium from seawater. The Japan Atomic Energy Research Institute says that there are 250 billion tons of this lightest of metals in the sea, at a concentration of about .1 gram (.004 ounce) per ton. Japan must now import over 3,000 tons of carbonic lithium a year.

Success in extracting strontium from seawater also was achieved, and it is hoped that working plants to do this on a large scale will be operational by 1985. Yearly, Japan imports about 1,000 tons of this material for use in radio and television manufacture and fireworks.

Death by Error

◈ "Despite precautions and protocols," says the Canadian medical magazine *Dimensions in Health Service*, "errors in blood banking whether administrative or technical result in serious incompatible transfusion reactions or death. The mortality rate from such errors in the United States has been estimated to be one death per 1,000 transfusions."

"Transfusion errors carry more serious consequences than other forms of drug therapy," continues the journal, "as it is virtually impossible to remove incompatible blood from the body once it has been administered." *One*

safeguard against such errors, the magazine notes, is to reduce the total number of transfusions by paying particular attention "to the justification of single unit transfusions."

Music and Muscles

◈ Former professor of psychiatry Dr. John Diamond has found that in over 90 percent of persons that he tested electronically a certain rock rhythm instantly caused more than two thirds of their normal muscle strength to be lost. The rhythm, called "stopped anapestic," is said to be found in about half of rock songs that become hits. Dr. Diamond believes that the rock beat, being the exact inverse of the heart and arterial rhythm, may upset brain synchronism, thereby inducing temporary weakness—the "Diamond Effect." Now, according to the *Medical Tribune*, Dr. Diamond is investigating "the industrial ramifications of the Diamond Effect after reading that productivity increased 15% and error declined 15% when a Yonkers, N.Y. [U.S.A.], factory switched its background music from rock to easy listening."

Black Rings

◈ The recently discovered rings around the planet Uranus caused quite a stir among astronomers. However, the rings will be very hard to observe. Recent attempts to photograph them reveal "only the slightest suggestion of a ring image," according to *New Scientist* magazine. Unlike the reflective water-ice-coated particles in Saturn's beautiful rings, the particles in the rings of Uranus are thought to be dark and composed of bare material similar to the surface of that planet's moons.

Heart Attack?—Cough!

◈ California heart researchers have reported to the American Heart Association that coughing may aid a person undergoing a heart attack to remain conscious until medical help arrives. Their studies indicate that coughing at one- to three-second intervals may help to maintain cardiac blood flow. "It's conceivable that this technique could have wide applicability among cardiac patients at high risk of sudden death," one of the researchers told a *Medical Tribune* reporter. "We would speculate that a patient, recognizing that he was going into ventricular fibrillation [resulting from a heart attack]—that 'sinking feeling'—could cough his way to a phone and call for help—and continue coughing until help arrived."—Jan. 25, 1978, p. 1.

"Gay Victory"?

◈ When the American Psychiatric Association (APA) removed homosexuality from its official list of disorders, homosexuals hailed the move as "the greatest gay victory." However, according to the *Washington Post*, there has been continuing debate among psychiatrists as to whether the APA action was based more on homosexual pressuring than on scientific evidence. A new survey by the magazine *Medical Aspects of Human Sexuality* indicates that this may be so. To the question "Is homosexuality usually a pathological [diseased] adaptation (as opposed to a normal variation)?" almost 70 percent of the first 2,500 psychiatrists who responded said "yes." The Bible agrees, calling homosexual practices "abnormal and unnatural."—Rom. 1:26, 27, *Phillips*.

New Pyramid?

◈ Work has begun to level the site for a new pyramid modeled after the great pyramid of Cheops. The Egyptian government gave permission to Japanese archaeologist Sakuji Yoshimura to build a one-fifteenth scale replica about four miles (6 kilometers) south of the original. "There are thousands of theories about how they were built and what was their purpose," observed the program producer for Nippon Television, which is sponsoring the project. "But no one has tried before to find out by the use of his own muscles." Stones will be hand cut and dressed with tools similar to those of the ancient Egyptians, but fork-lift trucks will put them in place. The replica is to be demolished after studies and photographing are completed.

Witch Doctors Upgraded

◈ The African Kingdom of Swaziland has given "'witch-doctors' the same status as Western-trained medical men," reports the London *Daily Telegraph*. The UN-affiliated World Health Organization has encouraged such recognition, noting that adequate health care cannot be achieved in Africa without the help of such "traditional healers." "A move is under way to give witch-doctors professional status" in Zambia, says the *Telegraph*, and "Nigeria has also decided to build a joint school of traditional medicine and a normal teaching hospital in Lagos."

Acacias for Chad

◈ The Central African country of Chad was hard hit by the long drought a few years ago. One program launched to help to restore the dry, denuded land was an acacia-planting project. Until now, 8,750 acres (3,540 hectares) of these hardy trees have been planted, and farmers are learning to appreciate their value. "The acacia was chosen because it is an extraordinarily suitable tree for semi-arid lands," notes the London *Times*. "The tree has a reverse deciduous cycle and gives shade and humus to the soil when everything else is long since dead and parched and it remains leafless when other vegetation is available as fodder." No doubt such qualities made acacia wood one of the major building materials avail-

able to the Israelites for construction of their portable tabernacle in the wilderness of Sinai.—Ex. chaps. 25-27, 35-38.

$5,000 Meal

◈ Until this year, the world's most expensive meal was eaten in France two years ago by New York *Times* food critic Craig Claiborne and a friend. Cost: about $4,000 (U.S.). But on December 14, 1977, New York restaurant owner Peter Cipolla and a companion consumed $5,004.20 worth of food and drink at New York's Palace restaurant, establishing a new cost peak. *New York* magazine observes that the $5,000 dinner, "by even the most liberal calculations, ran nearly $1,000 above what it costs to feed a family of four in the United States for an entire year. . . . Further, out of the 158 world nations, 136 have a family per-capita yearly income of less than $5,000."

Church 'Ambiguous on War'

◈ In a speech to cardinals, bishops and laity assembled for a World Day of Peace observance, Roman Catholic sociologist Gordon Zahn "blasted church leadership for what he called a 'confused and ambiguous performance on the issues of war and peace.' "—*National Catholic Reporter,* Jan. 27, 1978, p. 20.

The Catholic newspaper also reported that "Zahn declared instruction and training in the arts of war, such as ROTC [Reserve Officers' Training Corps] programs, at Catholic colleges should be 'as unthinkable as instruction and training in techniques of abortion.' "

Italian Priests Strike

◈ Fifty priests recently went on strike to protest a Vatican order transferring their four churches to another diocese, arousing old regional loyalties. "I'm at home and I am abstaining from work," said one of the striking priests. "I'm not ringing the bell. I don't say mass. Only in rare cases do I go to visit the sick."

Teen-Agers in the Kitchen

◈ With over 50 percent of mothers in the United States working, more and more teenage girls are in the kitchen, taking over some of their mothers' chores. More than 10 million teen-age girls prepare an average of 11 meals a week for their families and themselves. About half of the teenagers work up their own menu.