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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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Does your "yes" really mean yes?

TWO mature widows of meager means on Long Island, New York, were looking forward to a pleasant meal with a small group that was to include a longtime friend. In fact, he was to be their *special* guest. The gentleman had said "Yes" to the invitation, and so the women happily busied themselves preparing wholesome food, particularly in anticipation of his presence. But the man did not come. Years have passed since then, and the women bear the gentleman no ill will. Yet, they still recall that painful disappointment.

This true-life experience may be reminiscent of a time when you were disappointed by the failure of an invited guest to join you for a meal. On the other hand, like most of us, perhaps you can remember an occasion when unforeseen circumstances made it impossible for you to keep an engagement. At such a time, someone might well have wondered, Does your "Yes" *really* mean Yes?

An Underlying Principle

Naturally, there are promises much more significant than keeping one's word as an invited guest. But the underlying principle is the same whether the promise concerns a matter large or small. What is that principle?

Well, in his Sermon on the Mount, Jesus Christ said: "Just let your word *Yes* mean Yes, your *No,* No." Jesus was counseling against the custom some then had of lightly and indiscriminately making oaths. (Matt. 5:33-37) Certainly, a person does not need to back up every statement with an oath. He should simply keep his word. That is, his "Yes" should *really* mean Yes.

Of course, it is not always easy to keep one's word. Sometimes changed circumstances prevent this. Nevertheless, the Scriptures say that a practicer of righteousness having Jehovah God's favor "has sworn to what is bad for himself, and yet he does not alter." (Ps. 15:1, 2, 4) Yes, he may have solemnly agreed to something that turned out to be apparently against his personal interests. But he remained true to his agreement.

Jehovah God himself is the greatest Keeper of Promises, thus setting a superb example for those desiring his favor. Accordingly, the God-fearing man Joshua could write: "Not a promise failed out of all the good promise that Jehovah had made to the house of Israel; it all came true."—Josh. 21:45.

So, then, what principle underlies the words of Jesus, those of the psalmist and the statement by Joshua? Just this: A person should strive to keep his word. Indeed, one's "Yes" should *really* mean Yes, unless he has broken off his engagement.—Prov. 6:1-5.

Compelling Reasons

While the foregoing principle certainly applies to weighty agreements, consider again the relatively simple matter of accepting an invitation to dine with someone. Usually, a person is invited to another's home for a meal because of friendship. For that reason, the host or hostess gladly spends time and money to obtain and prepare food, as did the poor widows mentioned earlier. What friend would want to treat such things lightly by accepting an invitation to a meal and then failing to be present for little or no cause? Surely, true friendship alone would be compelling reason to keep the appointment. Moreover, reflection on the host's expenditure of time and money would furnish another reason to do so.

Truthfulness is yet another compelling reason to keep one's word by not treating an accepted invitation lightly and thereby disappointing a host or hostess. Fittingly, the psalmist David said of God: "Look! You have taken delight in truthfulness itself in the inward parts."—Ps. 51:6.

But what if a person accepts an invitation to a meal in a humble home and later is invited to a banquet in a mansion on that same evening? If he goes to eat with the rich and the one of little means learns of this, how will the poorer individual feel? Doubtless quite hurt and disappointed. So, the very desire not to cause such pain furnishes another compelling reason to honor the first invitation, letting one's "Yes" *really* mean Yes.

Interestingly, when Jesus Christ sent some of his followers out to aid others spiritually, he said: "Wherever you enter into a house say first, 'May this house have peace.' And if a friend of peace is there, your peace will rest upon him. But if there is not, it will turn back to you. So stay in that house, eating and drinking the things they provide, for the worker is worthy of his wages. *Do not be transferring from house to house.*"—Luke 10:1, 2, 5-7.

Jesus' disciples were to stay at a house until their mission in that town or city had been accomplished. His followers were not to transfer from one home to another because a certain householder possessed more goods or could offer the disciples greater comfort and entertainment than some other person.

The very recollection of these instructions to Jesus' followers could well affect a person's decision when he agrees to eat a meal at a humble home and later receives a more appealing invitation to enjoy a banquet elsewhere at precisely the same time. Unselfishness and honesty undoubtedly would move the individual to honor the original engagement.

In doing this, the guest is very likely to have a most enjoyable time at the humble home. Why, the warm, informal atmosphere there may be much more upbuilding than that at a great banquet! We are told in Scripture: "Better is a dish of vegetables where there is love than a manger-fed bull and hatred along with it."—Prov. 15:17.

Surely, fairness and consideration of others will move a good-hearted person to keep his promises. This is the course of truthfulness, something rightly expected of godly individuals. (Eph. 4:25) And the keeping of one's word should extend even to honoring invitations accepted to enjoy fellowship with good friends. Certainly, this is one way you, too, can prove that your "Yes" *really* means Yes.

Greece Changes Law on Conscientious Objectors

By "Awake!" correspondent in Greece

A NEW law adopted by the Greek Parliament finally has brought a measure of relief to this land's conscientious objectors. Until this law was passed, those who for reasons of conscience objected to taking up war weapons were subject to imprisonment, not just once, but a second, third and even a fourth time for the same reason.

The problem involves Jehovah's Witnesses primarily. Because of their strong belief in God's laws and love of their fellow humans, they will not take up arms and share in the conflicts of worldly nations. As a result, they have suffered inhumane treatment for many years in Greece. But now, through a specific provision voted by Parliament, conscientious objectors who refuse military service and are sentenced to prison are exempt from further military service requirements after their release from prison.

How long is this single term of imprisonment to be? The new law specifies four years. This is twice as long as the required two-year compulsory term for military service.

What led the Greek government to modify its stand regarding these conscientious objectors? Has this matter come up suddenly? No, for the history of this problem goes back many decades.

Not a New Issue

Although Jehovah's Witnesses always were conscientious objectors in Greece, the issue was not made prominent earlier in this century. There were several reasons for this. One was the fact that there were relatively few of Jehovah's Witnesses in Greece until after World War I. So it was not a big issue with the Greek government. Also, in the 1920's and 1930's Europe was still in revulsion against the horrors of the "Great War." So the stand that the Witnesses took against war service was not widely publicized in Greece.

In 1940 and 1941 the problem grew when Greece became involved in World War II, first with Italy and then with Germany. Conscientious objectors who were Jehovah's Witnesses were then sentenced by military courts to penalties of from 15 years to life imprisonment. But when Greece was overrun and occupied by German troops, those sentences were not continued.

At the end of World War II, Greece was liberated. But the problem of conscientious objectors became more acute.

This was due to the civil war that engulfed Greece between 1947 and 1950. Because of the prevailing atmosphere, a number of conscientious objectors who were Jehovah's Witnesses were sentenced to death by military courts. Thus, in the area of Larissa, John Tsukaris was executed on February 10, 1948. In the area of Nauplia, George Orphanidis was executed on February 11, 1949.

These executions aroused much adverse public opinion in different parts of the world. As a result of this public outcry, other death sentences were commuted to imprisonment—from 20 years to life.

Most reprehensible in all of this were the clergy of the Greek Orthodox Church. They continually pressured government officials to maintain the death penalty against the Witnesses. It was as if they demanded 'the head of John the Baptist on a platter,' wanting the ruling elements to do the dirty work of executing Jehovah's Witnesses.

But due to strong protests raised by various organizations, and intervention by prominent persons in the world, the clergy could not have their way. Especially helpful was a letter from Britain's House of Lords to the then Greek War Minister, P. Canellopulos. These efforts contributed to a more subdued treatment of Jehovah's Witnesses by the military courts.

New Type of Cruelty

During the decade of the 1960's, cases involving Jehovah's Witnesses became the object of another type of cruel treatment. These conscientious objectors were first sentenced to prison for terms of from four years to four years and eleven months. But, when completing that first term, they were again tried for the same reason and again sentenced to another similar prison term. When this second sentence was completed, the process was repeated for a third and even a fourth time. These penalties were rightly referred to as "chain penalties."

Then, in 1966, during peacetime, one of Jehovah's Witnesses, Christus Kazanis, was sentenced to death by an Athens court-martial for refusal to bear arms. This unexpected decision raised a great outcry in Greece and in other countries. Greek embassies everywhere were flooded by storms of protest over this astonishing sentence. Multitudes of letters and cablegrams of appeal were sent to the Greek government. As a result, the Kazanis case was reviewed and the death sentence was commuted to four-and-a-half-years' imprisonment.

A Change

In 1974 a change of government took place in Greece. A democratic form of rule was established. Owing to this more open type of rule, cases involving the repeated sentencing of Jehovah's Witnesses became more widely known throughout the world. Various organizations now took up the struggle against these inhumane sentences.

Among those involved were the European Committee for Human Rights, Amnesty International, and the Council of Europe. Representatives of these organizations visited Greek military prisons to investigate. It was agreed by all competent persons who looked into the matter that the situation was utterly intolerable for a democratic country. And it was particularly inconsistent that Greece, known as the "cradle of democracy," should have as part of its law such flagrant violations of human rights.

Publicity against this unjust treatment grew. Prominent officials in the Greek government, as well as journalists, began to publicize the situation. It was also pointed out by such persons that this treatment of decent citizens constituted a detriment to the national interests of Greece, since it resulted in disrespect for the country's name.

During 1977 the Council of Europe, motivated by humanistic ideals, conducted discussions about the treatment of Jehovah's Witnesses in Greece. A report submitted to the Council's Parliamentary Session singled out Greece as violating the human rights of these Christians more than any other country.

Finally, the matter was debated in the Greek Parliament. One deputy, Mrs. Virginia Tsuderos, proposed amendments to the existing law. These would restrict the penalties for objectors to armed service to one prison term only. Another deputy, Mr. A. Kaklamanis, pointed out the great harm that had come to Greece's reputation because of this issue. He noted that the repeated sentencing violated the International Treaty of Rome and also the Universal Declaration on Human Rights. Various deputies pointed out that nowhere in Europe was such treatment being handed out to conscientious objectors. It was observed that in many countries, including Communist lands, only one prison term is inflicted.

After discussing the matter thoroughly, the Greek Parliament voted to adopt a new law ending the repeated sentencing of Jehovah's Witnesses. It decreed that only one prison term could be handed out. It would be a term of four years, twice the length of military service. While this is still harsh treatment in comparison to other lands, it is a vast improvement over what had existed before.

Clergy Exposed

The humanitarian decision was condemned by representatives of the Orthodox Church in Greece. High clergymen severely criticized the government's action. The clergy appealed to the government not to apply the new law voted by Parliament.

Once more, these activities exposed the hypocrisy of the clergy. Here were men claiming to represent Christ, the "Prince of Peace," but who wanted peaceful Christians to continue suffering because of obeying Christ's teachings!

This inconsistency and hypocrisy did not go unnoticed. A religious editor of the newspaper *Kathimerini,* in its issue of October 22, 1977, wrote an article refuting the clergy's viewpoints. For instance, when the clergy protested that the new law would weaken support given to the combat part of the Greek army, the writer observed: "This is rather funny to be believed. We have been military men and we all know that we even count the days left when we will be discharged from the army. Only a religious fanatic or a fool would agree to serve for two more years [in jail] in order to avoid taking up weapons."

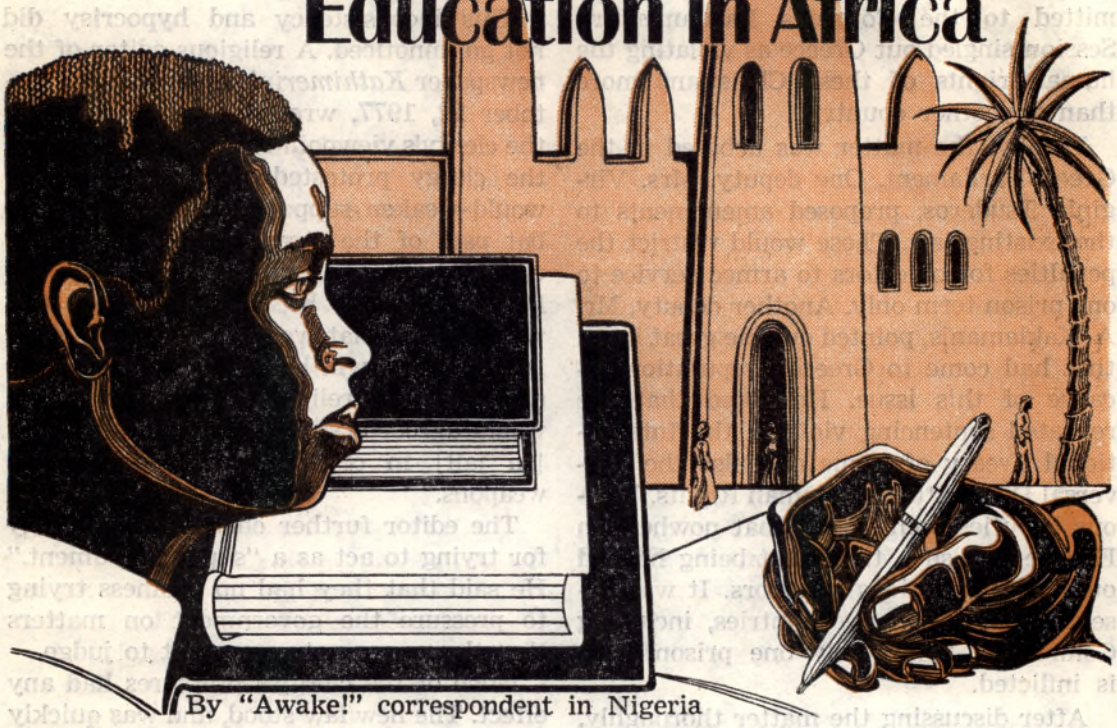
The editor further chastised the clergy for trying to act as a "super parliament." He said that they had no business trying to pressure the government on matters that they were not competent to judge.

None of the clergy's pressures had any effect. The new law stood, and was quickly applied. Forty-two Jehovah's Witnesses who were already in prison serving repeated sentences were released. Four of them were released because they had been in prison for four years or more, while 38 others were released pending a new trial, since they had not served four years yet, as specified by the new law. New sentencing will likely be required for them to complete the four-year term.

Thus, the Greek government has adjusted its manner of dealing with conscientious objectors. It has ended the "chain penalties" that the Christian witnesses of Jehovah have suffered for so many years.

The new law is a credit to the government of Greece. But credit also must go to the sincere Christians who held to what they knew was right even in the face of severe persecution.

The Development of Education in Africa



By "Awake!" correspondent in Nigeria

EDUCATION in Africa has a history reaching back many centuries. Certainly the achievements of the ancient civilizations of Egypt and Ethiopia are well known. Then, early in the first millennium of the Common Era, the Moors and other peoples on the northern fringe of Africa made notable contributions to world education and culture. And during the past 1,000 years the Saharan and sub-Saharan peoples had several centers of learning—Timbuktu, Agadez, Gao, Katsina and Borno, where books written in Arabic were in great demand.

More than 800 years ago at Timbuktu, in Mali, colleges provided advanced education. Katsina, in northern Nigeria, has been a center of learning since before the sixteenth century. It was there that, about 200 years ago, Muhammed ibn Muhammed became noted as a specialist in numerology.

The aforementioned cities were dominated by Moslem culture, and mosques were the centers of learning. However, the cost of learning under the tutorship of the *mallams* was very high and so few persons could afford it. The educated minority exercised tremendous influence, and were the key administrators, lawyers and clerks. But the majority remained illiterate.

In the non-Moslem, sub-Saharan cultures, education was largely nonliterate, by oral instruction rather than by use of reading material. Educational systems varied from tribe to tribe, and there were different degrees and levels of training, depending on the social and cultural development of a particular tribe. The training covered a

fairly wide range, with specialized instruction at different age levels. Each educational system had specific forms of preparation for the roles of individuals in society. A look at the system of education among the Yorubas in precolonial Nigeria illustrates this.

The Yoruba System

Among the Yorubas, training in obedience, etiquette, speech and counting came early in the child's life and was given within the family circle. Children quickly learned to express themselves in their language. Progressively, they mastered the proverbs, poetry and folklore of the community or tribe. In this way they learned the history and the moral and philosophical attitudes of their people. They had to learn a variety of greetings, recognition of levels of social seniority and the proper etiquette in connection with these. Religious education included training in rituals, sacred festivals and the roles of diviners.

At an early age, children were taught to count up to 20 on their fingers and toes and to do simple addition and subtraction with the aid of stones. As they progressed in knowledge, they were taught weights and measures, the use of cowrie shells (which served as money) and the art of bargaining.

Specialized training for boys focused on farming, working in metals and wood, hunting and the use of herbs and drugs in medicine. Skills were passed on from father to son. Inclination and natural abilities also were considered, and children were encouraged to develop their aptitudes. Therefore, many were apprenticed to artisans outside the family clan.

Girls received training in weaving and dyeing cloth. They learned to make pottery, to plait mats and baskets and to produce cosmetics for use in beauty treatments and hairdressing. They were taught the art of cooking, of brewing beer and of extracting oil from the kernels of the palm nuts. Thus they were prepared for their role as women in the family and the community.

The tribes that had a rural, pastoral or bush culture concentrated more on farming, herding and hunting or fishing. Some educational systems restricted progress into new fields of knowledge by preserving a closed society. Membership usually was restricted to those of certain ethnic origins or religious beliefs. This circumstance contributed toward a stagnation of knowledge. Nevertheless, the education that was provided amply served the needs of those societies.

The Colonial Era

In the wake of the missionary explorer David Livingstone, European missionaries began to increase their activities in Africa in the second half of the nineteenth century. Mission schools started to be set up in towns and villages, and right out in the bush, where students attended in simple loincloths or were completely naked.

These schools were set up on sectarian lines, with Catholics having their own schools and the Protestant religions theirs. This tended to segment the people religiously, and whole areas came to be regarded as the province of a particular religion. Divisions in social levels developed between the literate and the nonliterate segments of each community, and there was a gradual undermining of family influence. Other imbalances were created because traditional patterns of education were being uprooted and were not replaced by any uniform standard.

Still, a start had been made toward widening the horizons of knowledge in Africa. As more people learned to read and write, the knowledge of the world, contained in books, became available even to the re-

motest tribes. The literate history of non-Moslem, sub-Saharan Africa began to be revived.

Although the people showed aptitude in learning, there were obstacles to overcome. The missionaries usually had to learn the local languages first. Then they had to teach the children in their own European languages, in which books were available. Some did good work in formulating alphabet systems and compiling dictionaries so that many of the local languages could be put into writing. This provided the basis for translating the Bible into many African languages.

In some areas an obstacle was posed by the custom of barring girls from institutional education. When, over 40 years ago, one of the emirs from northern Nigeria visited England, he was impressed at seeing a large girls' school. He desired a similar provision for the girls of his people. Since the custom was to keep women away from public life, he realized that this would be opposed. So he told his council that he was opening a school in his palace for educating the girls in his household. Within a year the school had 30 pupils, and many of the leading citizens were petitioning the emir to allow their children to attend. A year later, on the pretext that he could no longer tolerate the noise of a school in his palace, he "turned the pupils, teachers, and equipment out into the open town and lodged them in a house adjoining the boys' school." (*African Challenge,* p. 63) Now every primary school in that section of the country is coeducational.

Since children were part of the labor force in each farm family, there was reluctance to lose them to the schools. Gradually, however, as the people recognized the value of the printed page and the advantages of reading and writing, more children were sent to school. So it was in mission schools that many of the outstanding educators and leaders throughout Africa got their early training.

The colonial governments, and the later sovereign governments of each independent state, encouraged the establishment of mission schools, giving financial and administrative help. Provisions were made for more uniform systems of schooling, and additional public and secondary schools and universities were established.

New Education Policies

Since 1970, in a further effort to ensure a more uniform standard of education, the Nigerian government has taken over control of private schools, including mission schools. This has given rise to the problem of adequate moral education in a totally secular school system. Therefore, the authorities have encouraged parents and teachers to provide moral guidance. Efforts have also been made to coordinate the Moslem and indigenous traditional systems of education with modern methods. It is hoped that this will stem the growing tide of unrest, immorality and drug abuse among youths.

In 1976 the Universal Primary Education scheme (UPE) was introduced to provide for free universal education throughout Nigeria. This will give children the opportunity to receive free primary schooling for six years, as well as junior secondary and senior secondary schooling for three years respectively. More schools are, therefore, being provided, and immediate plans are afoot to increase the number of universities to 13.

Adult Education

Because the majority of the adult population is illiterate, the various governments are giving increased attention to adult education. In Nigeria, where the literacy rate is 20 percent for a population of 70 million, the government has estab-

lished adult education centers in most villages and towns. Many men and women are availing themselves of this opportunity to learn to read and write.

Much progress also is being made in adult literacy programs operating in Kingdom Halls of Jehovah's Witnesses. By means of such classes, between 1962 and 1976, in Nigeria alone, 15,156 persons have been taught to read and write. Many of these were elderly and thought that they no longer had the ability to learn. They were mostly people from rural areas—farmers, hunters, fishermen, housewives. Their determination to obtain Bible knowledge and to be able to impart Scriptural instruction reawakened their desire to learn. Now they can read and write, and can help in teaching God's Word to others in their own language and also often in English.

For example, Ezekiel Ovbiagele was trained according to the traditional system of education, but was not taught to read and write. After he received oral Biblical instruction from Jehovah's Witnesses and was baptized in 1940, he saw the value of learning to read. He enrolled in one of the literacy classes and soon was reading the Bible to others. With further specialized training, he was qualified in 1953 to serve as a traveling overseer, having the responsibility to instruct many congregations in the territory assigned to him. Many others have made similar advancement.

When Jackson Iheanacho first attended meetings of Jehovah's Witnesses, he was literate only in Efik, his native language. He saw the need to learn to read in English, too, since the meetings were conducted in that tongue. With the aid of the congregation's literacy class, he achieved this and went on to learn other languages as well. He is now able to read and write seven languages!

The literacy rate among Jehovah's Witnesses is better than 77 percent. Most of the remaining 23 percent are attending literacy classes, either at their Kingdom Halls or at government centers, and so are in various stages of learning to read and write. They appreciate this program, which is reaching out to more and more people.

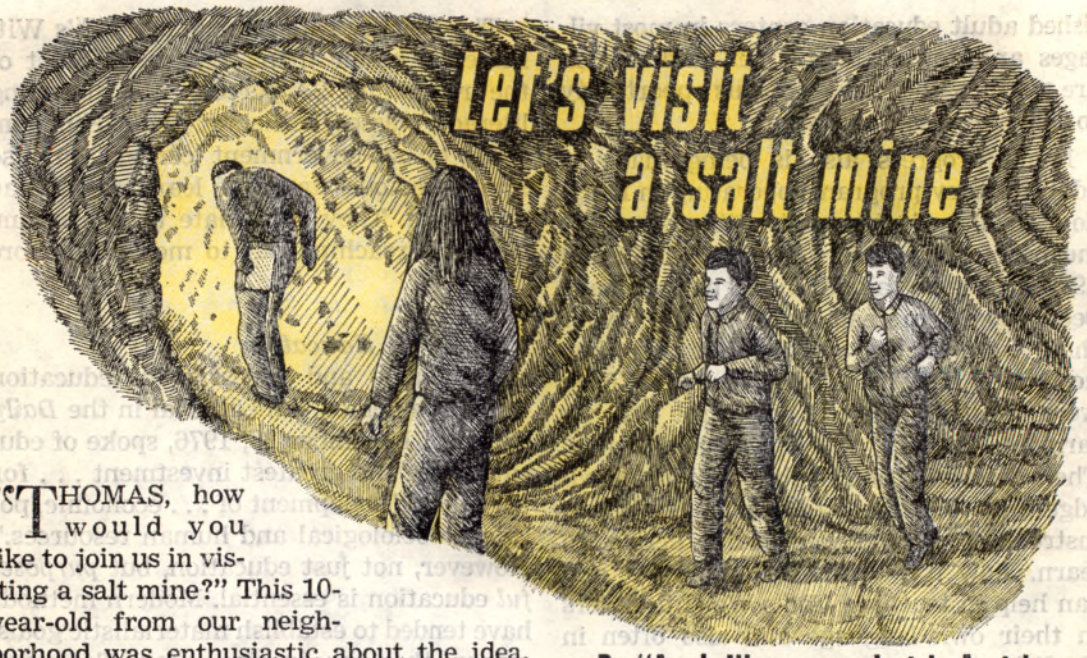
Purposeful Education

The value and necessity of education cannot be denied. An editorial in the *Daily Times* of December 29, 1976, spoke of education as "the greatest investment . . . for the quick development of . . . economic, political, sociological and human resources." However, not just education, but *purposeful* education is essential. Modern methods have tended to establish materialistic goals, rather than productive ones. To many youths, the purpose of schooling is to obtain a certificate that will guarantee a prestige job and great financial reward. Parents should guide youths in carefully evaluating the purpose of their schooling. The goal should be to acquire real skills and thinking ability so as to ensure productivity in their adult careers.

It should be remembered, however, that the period of formal schooling is not all there is to the process of education. Parents can make use of preschool and out-of-school periods to instruct their children morally and in other ways that will build their personalities along wholesome lines. Much good can be achieved by using the Bible in inculcating decency, honesty and loyalty in the children.

Beyond this, youths, by allowing day-to-day experiences to mold their personalities and skills in beneficial ways, will continue their education after completing formal schooling. In this way they will pursue the goal of being responsible and productive men and women, and their education will prove to be truly purposeful.

Let's visit a salt mine



By "Awake!" correspondent in Austria

"THOMAS, how would you like to join us in visiting a salt mine?" This 10-year-old from our neighborhood was enthusiastic about the idea, and we were delighted to have a companion for our 12-year-old son. Our destination? Hallstatt, an old salt-mining village in the Austrian Alps.

Arriving at Hallstatt, we park our auto and then walk to the cable car that will take us up to the salt mountain. From the windows, we get a breathtaking view of the lake of Hallstatt and the majestic mountain that rises steeply from its shore.

Hallstatt's Field of Graves

Leaving the cable car, we are on our way to the miners' house. Our walk takes us across a huge field containing more than 2,000 graves. About 1,300 of these have been opened and have yielded up to 10,000 objects from the time between about 950 and 390 B.C.E. Already at that early period systematic salt mining was being done here. Discoveries at this site and elsewhere in the area have enabled archaeologists to reconstruct the period of civilization from 750 to 450 B.C.E. so well that it came to be known as the "Hallstatt period."

The findings reveal that the people believed in continued existence after death. Among the objects buried with the deceased were urns, bowls, pails, weapons and jewelry.

In a meadow lying at an altitude of 1,370 meters (4,495 feet), graphite clay pottery has been excavated. On the bottom of nine of the vessels the potter had carved signs into the moist clay. One of these figures looks like a fork with several prongs. The work *Alte und Neue Funde aus Hallstatt* (Old and New Finds from Hallstatt) states that the figure is considered to be a character of an ancient script. We further read: "It is already found in the oldest letter script of Semitic alphabets as well as in the complement of letters of ancient Greek inscriptions." The sign is thought to be a symbol for "rain." The book *Vom Amulett zur Zeitung* (From Amulet to Newspaper) points out that, as an early pictographic symbol, this particular sign appears earth wide during "mythologically oriented stages of civili-

zation." It goes on to say: "Variations of such signs can be found in Mesopotamia, in Greece, in northern Europe (Hallstatt culture), among the [American] Indians, and in China." Thus, even the remote valley in the Hallstatt area evidently did not escape being influenced by Mesopotamian culture and religion.

A Tour of the Mine

But now we are anxious to tour the mine itself. At the miners' house protective coveralls are provided for visitors. Since the sizes are distinguished by a different color, we easily find a garment that fits.

A short distance above the miners' house lies the tunnel entrance to the mine. A miner welcomes us with his typical salutation, *Glück auf!* (the miner's "good luck!"). The passage leading into the mountain's interior was hewn in the year 1719. Our guide tells us that we are going to walk some 300 meters (980 feet) in the tunnel leading through the cap rock. An impermeable coating prevents the large salt deposits from being leached. Earlier, the outer layer may also have contained salt. But gradually this salt may have been washed out, leaving impermeable clay to shield the salt deposit underneath.

Several minutes later we come to a larger crosscut tunnel. From here, a slide made of polished tree trunks leads to a large cavity below. The four of us seat ourselves in the steep slide and, with a little push from our guide, find ourselves zooming downward through the tunnel. The slide's extension brakes our movement, and before us lies a huge cavernlike space. It is 2,000 square meters (21,528 square feet), with a volumetric capacity of 3,700 cubic meters (4,840 cubic yards).

Salt Production

Our guide explains that this area previously served as a dissolving installation. To open such an installation, the miners blast out an underground cavity of about 20 by 40 meters (65 by 130 feet). By means of a tunnel, like the one through which we slid, fresh water is poured into the cavity, filling it to the ceiling. The water dissolves the salt, and insoluble matter sinks to the bottom. After six or eight weeks, 100 liters (26.4 gallons) of water will contain 31 to 33 kilograms (68 to 73 lbs.) of salt. As the water leaches the salt, the cavity ceiling rises higher and higher, and the cavity itself moves upward. Depending on the salt concentration, each extraction process leaches from 50 to 150 centimeters (about 20 to 60 inches) off the ceiling. This process may be repeated from 50 to 70 times. Then the saline solution or brine is run off. For this purpose, the miners have cut not only a sloping tunnel leading to the cavity but also a horizontal one underneath through which a pipe runs for draining the brine. The dissolving installation is then closed.

Continuing our tour through the interior of the mountain, we climb the steps alongside the slide by means of which we gained access to the huge cavity. Eventually we find ourselves some 800 meters (2,600 feet) from the entrance passageway and, measured from the surface, some 400 meters (1,300 feet) underground. Again the four of us roller coast down a slide and are greeted by a spectacular view of a subterranean lake. Lights of various colors illuminate the cavity and the water reflects the letters forming the miner's salutation *Glück auf!*

The installation is larger than the first one we saw. Its ceiling extends over an area of 3,800 square meters (40,900 square feet), and the volume of this cavity amounts to 15,300 cubic meters (about 20,000 cubic yards). By means of a path around the underground "lake," we are able to view the installation from every side. The reflection of the ceiling in the

lake's heavy, very saline brine is so clear that we can recognize every detail as in a mirror.

Our Tour Draws to a Conclusion

The path through the subterranean cavities leads up to a pit with several information boards. Our guide explains to us that the brine is transported in a 40-kilometer (25-mile) pipe and is then processed, finally to become salt for industrial purposes or for the dining table.

At the conclusion of our tour we climb a flight of winding steps and again reach the entrance tunnel. Our guide invites us to sit down on a small railed car. The tunnels have a slight gradient of about 1.5 percent. This is enough for us to ride into the daylight at the exit.

We truly learned much, and time passed quickly in the miners' subterranean realm. Thomas told his parents: "I haven't had such a nice day for a long time." Our son added: "What an experience!"

The Playful Otter

OTTERS are among earth's most playful animals. They seem to take delight in sliding on their bellies, either down snow-covered slopes or wet riverbanks. They play tag and engage in mock combats. They are not averse to including other creatures—dogs, raccoons or foxes—in their endless games.

The common otter of Europe is much like the otter inhabiting North America, though the European variety is smaller. Both are superb swimmers. An otter is said to travel in water at a rate of some 10 miles (16 kilometers) per hour. Usually three humps are seen above water when the animal is swimming—the head, the back and the end of the tail. A family group of otters swimming in line has at times been mistaken for a sea monster.

Both the North American and the European otters are also at home on land. Despite short legs, otters can overtake a running man. They may travel some 15 miles (24 kilometers) during a night. There is a record of one otter that was chased for 28 miles (45 kilometers).

These creatures are well equipped for swimming. The strong tail functions as an excellent rudder and enables the animal to glide into the water without making a big splash. An otter may swim with all four legs drawn up against its body. When that

is the case, the tail provides propulsion. Or, the otter may swim by rapidly moving its large, webbed hind feet.

The youngsters, however, do not automatically take to the water. Writes François Bourlière in *The Natural History of Mammals:* "Liers [a North American authority on otters] informs us that young otters do not enter the water of their own accord but are dragged in by their mother, who pulls them by the skin of the neck and catches small prey (crayfish, frogs, and little fish) to lure them on. Moreover their first attempts at swimming are awkward, the young learning little by little to swim properly."—P. 189.

For the common otter diving is no problem. This creature is capable of diving 40 feet (12 meters) below the surface and may stay underwater for about four minutes. It can swim underwater for as much as one fourth of a mile (.4 kilometer).

Simply amazing is this animal's sense of direction. It may get into a frozen river through a break in the ice and thereafter has no trouble in finding its way back to the opening.

Though usually concentrating on smaller fish and other water creatures, an otter may tackle a fish weighing as much as 20 pounds (9 kilograms). This is quite a feat, considering that this is about the weight of the otter itself. To catch fish, the animal uses its forepaws.

The otter's fur is ideally suited for its existence. The outer layer consists of long coarse hair, whereas soft, woolly fur makes up the underlayer. When in water, the outer layer adheres closely to the body, compressing the dry underfur. Air trapped in the underfur provides excellent insulation, keeping the skin dry.

Sea Otters

Sea otters, each weighing some 70 pounds (30 kilograms), are even more creatures of the waters than is the common otter. They are found near the shores of North America and Siberia. There in beds of brown seaweed, known as kelp, sea otters are at home. So as not to drift away when at rest, they wrap themselves with some kelp.

In times of storm, sea otters come to land and search for an area sheltered from the winds. Regarding their sleeping sites, *Grzimek's Animal Life Encyclopedia* (Vol. 12, pp. 86, 87) states: "At night the sea otter rests in a depression, usually protected by a rock and marked with a feces heap; this sleeping site may be 10 m[eters] [33 feet] from the water. During the summer, sea otters sometimes spend the entire night on seaweed fields far from shore, where they are protected from their chief enemies, the killer whale and the Greenland shark. The otters flee onto land when one of these predators approaches."

When speed is not essential, this creature lies on its back, propelling itself with its tail. When swimming right side up and moving its webbed feet in unison or alternately, the sea otter may swim at a rate of some 12 miles (19 kilometers) per hour.

The animal may dive 100 feet (30 meters) or more below the surface to get its

In Future Issues

- ***Life on Earth —Design or Coincidence?***
- ***Mercy Killing—What Do Lawyers Say?***
- ***How Is Television Affecting Us?***

food—sea urchins, mussels, clams and the like. Once the sea otter comes to the surface with food, its chest becomes a dining table. Perhaps with a rock on its chest, a sea otter will bang shellfish against it. Or, it may pry open shellfish with its teeth or paws. Still another method is to pound one clam against another one.

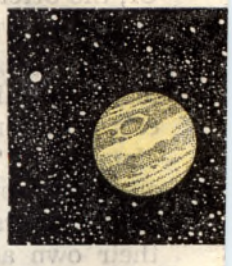
To satisfy its hunger, the sea otter must do quite a bit of diving and pounding. It may consume the equivalent of a fifth of its body weight in food daily. In a little less than an hour and a half, one sea otter reportedly came up with 54 mussels, pounding these against a stone more than 2,000 times.

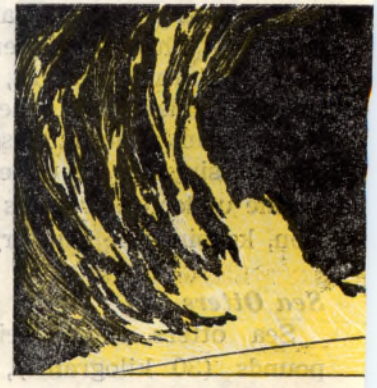
The sea otter is also quite adept at scratching itself. All four paws may be in motion at one time, each in a different direction.

In caring for its young, the sea otter shows a certain playfulness. While the mother floats on her back, the baby nurses. At times the mother will throw her baby into the air and then catch it. Mother sea otter makes sure that her baby is clean. Using her teeth and her tongue, she cleans it thoroughly, from head to tail.

Because of their valuable fur, sea otters have long been hunted ruthlessly. Finally, at the beginning of the twentieth century, they came under the protection of the law. Now sea otters have increased to the point where fishermen along the coast of California claim that their livelihood is threatened. They contend that otters are consuming too many shellfish. Already an undetermined number of otters have been shot despite their being protected by law.

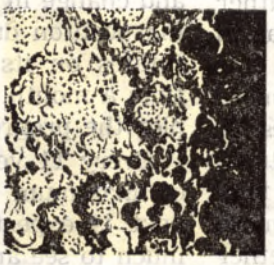
Man's commercial ventures often make life difficult for earth's creatures, including the playful otter. But these amusing animals still scamper about unmolested in many places where you can observe their playful antics.





Exploring the Heavens at Home

By "Awake!" correspondent in Australia



WITH the advent of television in many parts of the world, the joys of creating, exploring or adventuring have diminished. Entertainment takes up much of the leisure time many have available. However, the thrill of seeking new knowledge and exploring beyond known boundaries is something that has moved men to risk their wealth and even their lives.

Would you like to explore the craters and mountains of the moon or get to know better the planets of our solar system? What about a closer look at the Milky Way galaxy, of which our sun is a part, or the vast galaxy of Andromeda, which is a staggering 1,500,000 light-years away? (See Footnote On Page 18)

These are just some of the exciting things that have opened up to thousands of individuals and families who have taken the

time to explore the heavens with the aid of binoculars or a small telescope. In this way they have been able to view tens of thousands more stars than just the 2,000 or so that one normally sees with the naked eye on a clear night; and in so much more detail! What appears to the unaided eye as a single star becomes two or more. Details of the moon's craters, Saturn's rings and multitudinous star clusters become visible.

Obtaining a Telescope

A simple pair of binoculars will reveal much to you, but if you want to explore farther you will need a small telescope. There are two types commonly available from commercial manufacturers: lens-based *refractors,* two to five inches (5 to 13 centimeters) in diameter, and mirror-based *reflectors,* four to 12 inches (10 to 30 centimeters) in diameter. For the same diameter, reflectors weigh less, are shorter, easier to carry and store and generally cost less than refractors.

The purpose of a telescope is to gather in as much light as possible as well as to magnify. A two-inch (5-centimeter) unit funnels into the eye about 60 times more light than the eye normally captures. A three-inch (7.6-centimeter) one captures about 140 times more light. A larger telescope gives a brighter picture with more details, but is more expensive. Whether buying one new or secondhand, it is wise to obtain it first on a trial basis, if possible.

On the other hand, you may choose to make your own telescope and its stand right at home. This can be done inexpensively and without spending a great deal of time. One interested in making a telescope must purchase suitable lenses, but can improvise the rest. Telescopes are available also in kit form at quite a saving. A good handbook on amateur astronomy can help you at both constructing and testing a telescope.

Viewing the Sun

Can you explore the sun with a telescope? Yes! BUT BE CAREFUL! *Never, under any circumstance, should you look directly at the sun through a telescope or binoculars.* You could be permanently blinded! However, it is possible to project the image from the telescope onto a screen and cut down other light falling on it. This permits exploring the sun's surface. If you do this, before long you will make an interesting discovery. The sun's surface is not all bright! It also has some dark patches on it.

These are "sunspots." Some are far bigger than the earth. They are composed of gas that is cooler than the rest of the sun's surface, even though the sunspots may be 4,000 degrees Celsius (about 7,000 degrees Fahrenheit). They can appear, disappear and change in shape and are always shifting position due to the fact that the sun rotates on its axis once in a little less than a month. Some find it interesting to plot the progress of sunspots.

Every 11 years or so there is a period of maximum activity of sunspots. The next is expected in 1980. Yes, there is much to see and learn about our sun. But remember: BE CAREFUL!

Exploring the Moon

You will find it interesting to take a good look at our nearest neighbor, the moon. A fine occasion for this is during the first quarter and on until the moon is half full. At that time long shadows make its landscape stand out more clearly. A look through the telescope will reveal rugged, towering mountains on the lunar surface. There are also rolling plains (which at one time were thought to be

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A "light-year" is the distance that light travels in a year at the speed of some 186,000 miles (more exactly, 299,338 kilometers) a second. A single light-year amounts to nearly six trillion (5,878,000,000,000) miles (9,460,000,000,000 kilometers)!

seas), gigantic craters, jagged cliffs and all sorts of other landmarks. But not a drop of water!

Man has also discovered that the moon's soil contains the same elements as the earth's, but in different proportions. And contrary to some popular misconceptions, the moon has one of the darkest surfaces of any body in the solar system; it reflects only 7 percent of the light that falls on it. Nevertheless, it is sufficient to provide a soft, pleasant illumination at night for earth's inhabitants. This highlights its Scripturally stated purpose of being the "lesser luminary for dominating the night."—Gen. 1:16.

On to the Planets

Although the planets are much farther away, there is still much about them of interest to explore.* Venus, often called the morning or evening "star," is a good starter. Most of the time one can view it either during late morning or early evening hours. Doing so will reveal that Venus goes through phases just like our moon.

Jupiter is usually the next brightest. It is the largest planet of our solar system, being about 87,000 miles (140,000 kilometers) in diameter. This planet has 13 known moons, four of which you will be able to locate with a small telescope. However, they may play "hide and seek" by changing positions, or by one or two disappearing for a while as these moons travel in their orbits around Jupiter. You may also see Jupiter's belts or streaks as well as its mysterious red spot.

Then there is Saturn, a thrilling masterpiece of God's creation, with its beautiful ring system. This magnificent set of three rings of varying brightness is thought to be composed of millions of tiny particles, each behaving like a satellite of the planet. They are quite a spectacle!

The bright-red planet Mars with its polar ice caps is intriguing too. But with a small telescope one can study it in detail only every two years, when it comes closer to the earth. If you did not see Mars in 1977, it will be necessary to wait until 1979.

Still Much More to See

After exploring our solar system, a person can reach out farther into the depths of space. The stars! How beautiful they are, hanging like shining jewels against the blackness of night! With some you find that what appeared to be just one star is really two or more, close together.

Alpha Crucis, brightest star of the Southern Cross, and Beta Cygni in Cygnus the Swan are examples. The latter consists of a yellow star with a smaller blue one revolving around it. Hazy patches in the sky prove to be large numbers of closely packed stars. And how thrilling to discover the delightful colors of these heavenly bodies, from bright red to gold, green and blue. How true the words of an inspired Bible writer, expressed without the aid of a telescope: "Star differs from star in glory."—1 Cor. 15:41.

It is fascinating, too, to contemplate that many stars that we see are thousands of light-years away. That means people view them, not as they are now, but as they were when the light left them that long ago. For example, when Chinese astronomers in 1054 C.E. noted an exploding star in the constellation of Taurus (the Bull), they were viewing an event that had occurred about 3500 B.C.E., during Adam's lifetime. Time and distance strain the limits of comprehension as you explore the universe.

Again, consider the Andromeda galaxy. This is notable as the most distant object

* See *Awake!* of August 22, 1975, pages 12 to 16, for more details.

that can be seen with the naked eye. It is nearly nine quintillion (9,000,000,000,000,000,000) miles (some 14,000,000,000,000,000,000 kilometers) away from us. As we look tonight at that faint nebulous glow in Andromeda, the light that enters our eyes is ending a journey that started *one and a half million years ago*. How far one can see on a clear night! It is an awesome realization, almost as if one were looking into eternity.

The scope for exploring is unlimited. There is always the thrill of seeing a gigantic fireball light up the heavens, or a "shooting star" (meteor) blaze a fiery trail through the darkness. It has been estimated that 90 million meteor trails can be seen during any 24-hour period over all the earth, though many are only momentary. They can be seen more often in the early morning because then the part of the earth where you live is facing forward in its journey around the sun and is meeting the meteors head on. At certain times of the year spectacular meteor showers occur, as the earth plows through a stream of meteors that are themselves revolving around the sun.

Occasionally you may even have the opportunity to view a partial eclipse of the sun or moon, or even the rare occurrence of a total eclipse, as happened in Australia in 1976.* And do not forget the man-made satellites that human technology has succeeded at placing in orbit. In Sydney, Australia, about 12 of these can be seen each week with the naked eye. Binoculars will serve best for a closer examination.

Exploring the heavens at home can be of great enjoyment to young and old. Whether a person does his observing with the unaided eye or explores in greater depth, one cannot help but echo the words recorded at Psalm 8:3, 4: "When I see your heavens, the works of your fingers, the moon and the stars that you have prepared, what is mortal man that you keep him in mind, and the son of earthling man that you take care of him?"

* See *Awake!* of May 8, 1977, pages 16-19, for details.

Making a Bottle Garden

Have a pretty bottle that you just cannot bring yourself to throw away? Want to make a window ledge or sunny corner come to life? Then try a 'bottle garden.'

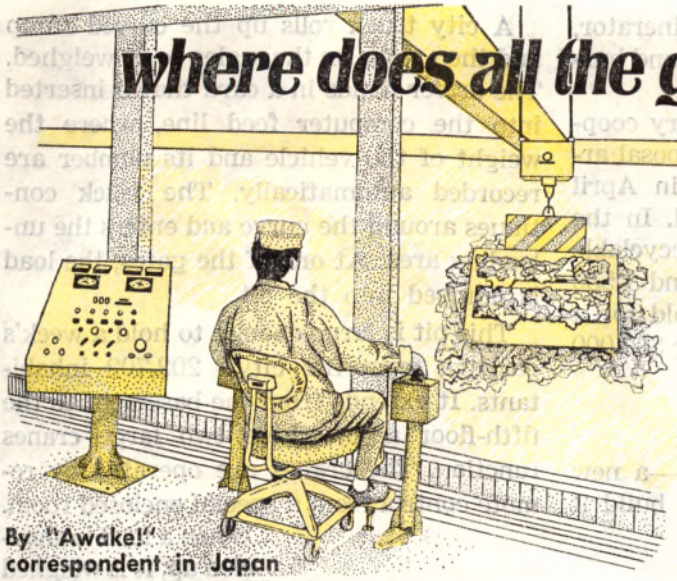
A bottle garden is an arrangement of plants that need only water and so can be easily grown in bottles. Variety is the key to making this miniature house garden attractive. Among the many plants that will grow in water are: geraniums, peperomia, ivy, wax begonia, hibiscus, coleus and impatiens. And as for containers, the variety is endless. Jars, vases, aquariums, beverage bottles, all lend themselves to imaginative use.

After thoroughly cleaning the containers, fill each with fresh water. Next, cut the stem of each plant just below the lowest node (the point where the bottom leaf originates). Remove any damaged foliage from the stem and also remove any foliage that would be below the water level. As you place the plants in the containers, be sure to arrange them loosely.

One of the joys of a bottle garden is the minimal care required. When you see that the water level has gone down you can pour in more water. In many climates it will be necessary to change the water once a month to prevent algae from growing.

Lowly bottles, leaves and vines can combine to put color and zest into a room. They can also serve as a refreshing reminder of the Creator of "all green plants," the "fresh growth" of the earth.—Gen. 1:30, 11-12, *The New English Bible*.

where does all the garbage go?



By "Awake!" correspondent in Japan

"HOW exasperating! All I was going to do was empty the dustpan, but the wastebasket spilled over. Now I have an even bigger mess!" At one time or another this may have happened to you. And it is what many large cities in the world *are* experiencing on a vast scale. Their garbage-disposal facilities are taxed to capacity.

This was a problem in the city of Numazu, Japan, in a very scenic area between stately Mount Fuji and Suruga Bay. The incinerator that had been built about 10 years earlier just could not cope with the demands put on it. A large portion of the garbage was only partially burned. Therefore, the ashes that were buried included much raw vegetable matter. What was the result? There was a tremendous expansion in the fly population.

When, for example, a truck driver started to dump some ashes from a factory, he noticed that the ground changed color. What appeared to be black topsoil was in reality a blanket of flies. Then, suddenly, the flies took wing, leaving the lighter colored earth exposed. The truck driver beat a hasty retreat, oblivious to the fact that his vehicle was covered with flies. The unwelcome guests stayed on for nearly a week.

Besides multitudes of flies, thousands of crows found a sumptuous feast at this garbage burial site. Eventually these birds spread out to the surrounding farms and damaged growing crops. Soon people adversely affected by the flies and the birds raised their voice in protest, demanding that no more garbage be buried in the area.

After many meetings it was resolved that the following measures be taken: (1) Find other areas in which to bury the garbage, (2) take steps to reduce the garbage, and (3) build a new incinerator to burn all the combustible garbage into ashes. There was no difficulty in finding more land for garbage burial purposes. But how could the amount of garbage in a growing city be reduced?

Reducing the Garbage

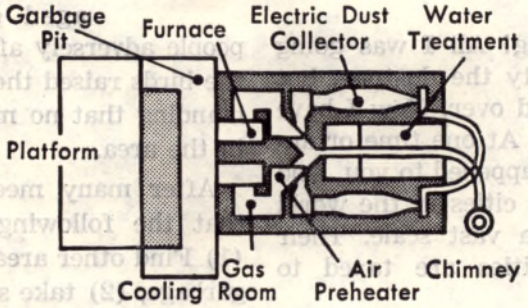
The inhabitants were asked to divide their garbage into three distinct categories: (1) Combustible garbage [kitchen refuse and wastepaper]; (2) noncombustible garbage [broken china, fluorescent bulbs and plastic]; (3) recyclable garbage [metallic things, including tin cans, glass and glass bottles]. Then certain days were assigned to collect the various kinds of garbage. Because only the combustible gar-

bage would be taken to the incinerator, the amount that had to be burned and buried was reduced.

The people of Numazu were very cooperative when the new garbage-disposal arrangement went into operation in April of 1975. A rich dividend resulted. In the fiscal year 1975, 335 tons of recyclable garbage—metals and tin cans—and 1,530 tons of glass and bottles were sold for a total of $30,280. Think of it—over $30,000 was earned from garbage!

Pollution-Free Incinerator Plant

What about the third measure—a new incinerator? Plans were made to build it right next to the existing incinerator. People living nearby, of course, were not too happy to hear of this and they protested. There were repeated meetings with neighborhood representatives, and finally a mutual understanding was reached. The most important assurance was that there would be no secondary pollution from the new incinerator.



Construction started immediately and the job was completed in June of 1976. The building is equipped with sophisticated machines, remote controls and a computer. A working force of only 30 persons is sufficient to man the entire plant. Whereas the old incinerator had a capacity of 125 tons per day, the new one can handle more than double that amount—300 tons in 24 hours.

Unloading the Garbage

Let us follow a load of garbage through this plant and observe how it is reduced to ashes.

A city truck rolls up the curved ramp and then stops on the scales to be weighed. The driver hands in a card that is inserted into the computer feed line, where the weight of the vehicle and its number are recorded automatically. The truck continues around the curve and enters the unloading area. At one of the gates, the load is dumped into the pit.

This pit is large enough to hold a week's garbage from the city's 202,702 inhabitants. It extends from the basement to the fifth-floor area, where two large cranes function. The cranes are operated by remote control from a special enclosed room. When a load is shoveled up, it is weighed automatically and its weight is recorded. The load then is dropped into the hopper.

Garbage to Ashes

The hopper serves as the entrance to the incinerator proper. From there the garbage is fed, little by little, into the furnace. The flow of garbage is controlled automatically by special equipment, preventing the furnace from becoming choked.

On entering the furnace, the garbage is first exposed to hot air that rises up from the lower sections of the furnace. This air has a temperature of 950 degrees Celsius (1,742 degrees Fahrenheit). Wastepaper and the like are consumed, and vegetable and fruit matter is dehydrated.

At this point the garbage, or what is left of it, starts to move down over a series of stairlike fire grates. Each grate is hinged on the outside edge and lifts 90 degrees from the rear. This arrange-

ment makes it possible to dump everything from one grate to the next one below. It also keeps the garbage in constant agitation and assures that everything is thoroughly consumed by being evenly exposed to the air and tremendous heat. The entire process is monitored by television cameras and is watched in the central office. Finally, when the burning process is completed, the ashes fall between two rollers. Anything that has not already turned to dust and ashes (perhaps some tin cans and the like) is crushed.

If the dust and ashes had to be handled in this form, the whole plant would be covered with their film. Therefore, water is run into the areas where the dust and ashes fall. By conveyor belt the wetted substance then is transported to the ash-pit. There the water is allowed to drain off. Next a remote-controlled crane loads the ashes onto trucks, to be taken to the burial grounds.

Of course, where there is combustion, gas and fumes are given off. How, then, is the pollution kept down?

Preventing Secondary Pollution

Gas is channeled by ducts to the gas-cooling chamber, where jets of water under high pressure bring the temperature down from 950 degrees Celsius (1,742 degrees Fahrenheit) to 800 degrees Celsius (1,472 degrees Fahrenheit). Then the gas is used to heat water for the workers' showers and baths. Finally it passes through a preheater and warms the air that is sent to the furnace. By now the temperature of the gas has dropped to 300 degrees Celsius (572 degrees Fahrenheit).

After large particles are filtered in a machine called a "multicyclone," the gas undergoes the final cleansing process. By means of static electricity, an electric dust collector removes enough contaminants from the gas to allow what remains to be released into the atmosphere through the 80-meter (262-foot) concrete chimney.

Another polluted element that must be handled is the water used for washing the trucks and the water from the ashes and the garbage itself. Though drawing water from Numazu City, the plant has its own filtering system. After being filtered and processed, the water is sent to the gas-cooling chamber. After being vaporized during the cooling process of the ultra-hot gas coming from the incinerator, the water, in the form of vapor, passes out of the chimney.

What about bad odors? You might expect them to be very pronounced, but this is not the case. An air curtain shuts out the unloading area from the outside. When trucks dump garbage into the pit, powerful fans draw the air out of the pit, sending it through the preheater and on into the furnace. There a temperature of 950 degrees Celsius (1,742 degrees Fahrenheit) burns away the unpleasant stench. On account of the fans, the air pressure inside the pit is lower than that at the unloading area. The stench-laden air, therefore, cannot get out.

Of course, the equipment needed for preventing secondary pollution is very expensive. The total cost of the new incinerator plant was a fabulous $9,200,000 (2,760,000,000 yen)!

To some persons such a tremendous outlay of funds just to handle garbage may seem exorbitant. However, to those who love healthful and beautiful surroundings, this is not extravagant but is a necessity. They look forward to the time when harmful pollution will be controlled everywhere on earth and when the prime concern of all will be the welfare of humankind as a whole.

Music for You from SINGING BAMBOOS

By "Awake!" correspondent in the Philippines

THE hall slowly fills with the strains of a *balitaw* from the distant southern islands of the Philippines. These are joyful notes tinged with pianissimo, as though the homesick wanderer were recalling lost youth and happier days. The last chord dies away and everyone is quiet.

The next number begins with the dreamy chords of another song, *Sarong Banggi* (One Night). This tune rapidly climbs into an excited crescendo, as though a young girl has awakened from deep slumber to the sound of a night bird and has thrown open her window to its singing.

Now the 100-member orchestra holds the audience in its grip with a rendition of *Dahil sa Iyo* (For Your Sake), easily this country's favorite love song. Soon you find yourself humming along. The notes diminish and the song is ended. But the audience wants more.

You are listening to the *Pangkat Kawayan,* or, as many people call them, the Singing Bamboos. *Singing Bamboos?* To appreciate the name, please take a closer look at the instruments on the stage. Yes, they are mostly of bamboo. Only a few are made of metal. The music you are enjoying is played on expertly crafted bamboo instruments, and by an orchestra composed of schoolchildren.

The Instruments

These are the wind instruments: the *bumbong,* the *himig bumbong* and the *tulali* or *gahumay*. They are played like the Western trumpet, trombone and flute —but with a difference.

The *bumbong* consists of separate bamboo tubes, each capable of only a single tone. The longer the bamboo, the lower the tone, and the shorter the bamboo, the higher the tone. Hence, only a single tone is played by one tube and several *bumbong* are needed to match the tones on the scale. This calls for perfect synchronization of all *bumbong* during the playing, especially in fast music.

The *himig bumbong* is a much longer tube, with more holes. Five to seven players are assigned to just one instrument, each player to blow just one particular tone. Again, in playing, the timing has to be perfect. For marches and fast music, the *Pangkat Kawayan* has to achieve superb coordination, with several players using only one instrument among them.

The flutes, or *tulali* and *gahumay,* are smaller and shorter tubes, with seven holes to a tube. They are played like the Western flutes.

Then there are the percussion instruments. One is the *gabang,* the Muslim xylophone. It is trapezoidal in shape, with the keyboard made up of flattened pieces of bamboo of different lengths and sizes. The longest lies across the wider end, the keys tapering down in size to the smallest piece on the narrowest end of the instrument.

The *talunggating* is the Philippine marimba, similar to the *gabang* in construction. Both are played in the same way, except that the bulky *talunggating* has several resonators, while the smaller *gabang* has none. In parades the *gabang* is preferred because it is portable.

The hardest instrument to construct, but the easiest to play, is the *tipangklung.* Perhaps you would call it the bamboo piano or harp. Actually, it is a combination of both. The keyboard consists of 36 bamboo keys attached to an equal number of bamboo tubes.

The *bungkaka* is the clapper. In playing it, the split end of the bamboo tube is struck against the palm of the left hand, with the prongs producing the accent and rhythm. The *talunggating* and the *tipangklung* provide the melody.

The *Pangkat Kawayan* also uses the drum, the gong, the triangle and cymbals. But the bamboo instruments dominate the music.

Making the Instruments

The bamboo grows wild in the countryside. Big clumps of it may be seen along riverbanks, roads and mountainsides. The young shoots make fine vegetables, whereas the spiny twigs are ideal for trellises and vines. But the long dark-green hollow stems, tapering skyward some six meters (20 feet) at maturity, have a myriad of other uses—for toothpicks, fans, seats, paper currency, bridges and houses, or for excellent musical instruments that are unique.

True, the graceful bamboo makes its own music when the wind blows. But the music coming out of bamboo instruments made by talented craftsmen, and in the hands of specially trained musicians, truly is beautiful. Yet, not just any bamboo will do!

The species ideal for music making is the carabao bamboo. It hardens well and produces fine sound. But it takes two to three years to grow the right carabao bamboo. Immediately after cutting, the long hollow stems are soaked in salt and water to remove the sugars.

Each musical instrument may be called a labor of love. There are no reference books, manuals, journals or other publications to consult in making the instruments. And there are no foreign experts to offer counsel. Rather, simple, painstaking research and a lot of time and hard work are required for fine craftsmen to make each bamboo instrument.

Precision, too, is demanded. If the bamboo is cut a millimeter shorter or 100th of an inch longer than it should be, or if the tubes are not matured to the proper degree, the tone played on that particular instrument will be off-key. The holes must be bored at the right place with great care, as the bamboo could crack with the use of the wrong fraction of strength.

Many fine bamboos were damaged during the early years of the *Pangkat Kawayan.*

Training the Musicians

If you think that the musicians are graduates of some sophisticated school of music in Asia or Europe, think again. These are fresh-faced Filipino boys and girls, six to 18 years old.

Most of them had no musical background. What they needed to qualify for membership in the *Pangkat Kawayan* was a strong musical inclination and much parental patience and cooperation. First, they were taught to read notes. Later, they learned the mechanics of handling the instruments. The bamboo tubes, arranged according to the musical staff with the corresponding notes, served the children well during their early training.

Alertness is necessary on the part of the children, as they have to play the tones clearly, at the right time and in perfect synchronization with the other instruments. Hence, their eyes never leave the conductor, who makes hand signals during the playing.

According to the conductor, the seating arrangement also plays an important role in proper coordination. To the left of the conductor, we see the bass group, the low-pitched *bumbongs;* to his right, the horn section, or the high-pitched *bumbongs.* In front of the podium are the *tipangklung* and the *talunggating.*

In large auditoriums, the bass section is at the left of the podium. The horn section is in the center of the orchestra, while the *tipangklung* and the *talunggating* are at the conductor's right. The cymbals, drums, gong and triangle are at the back.

Now, please do not get the idea that these children are still wide-eyed amateurs. Far from it. They now are seasoned players, professionals. They have played before audiences at the Cultural Center of the Philippines—the major concert hall in the country—as well as before musical intellectuals and high officials here and abroad. They played at the International Trade Fair in Osaka, Japan, in 1970, and again in Peking, China, during a state visit of Mrs. Imelda Marcos, wife of the Philippine president.

Their repertoire is wide. Besides Philippine music, the Singing Bamboos can also play Beethoven, Brahms, Chopin or Strauss. Australians might enjoy listening to *Waltzing Matilda,* while Americans might ask for *When Johnny Comes Marching Home.* If you are a lover of Oriental music, these youngsters can play that too. You may request songs from Indonesia, Japan or China and they would be happy to oblige. Their songs, too, have been recorded for those who prefer music at home.

But now the concert is drawing to a close. What is that tune they are playing? *Lawiswis Kawayan.* That is the song of the Whispering Bamboos. How apt! So close your eyes and listen. And be thankful that the Creator of bamboo has given mankind the gift of music.

The Bible's View

Is It Right to Pray for All Men?

THE apostle Paul exhorted "that supplications, prayers, intercessions, offerings of thanks, be made concerning all sorts of men, concerning kings and all those who are in high station." (1 Tim. 2:1, 2) Yet, there is a limiting factor, for the apostle John did tell fellow believers: "There is a sin that does incur death. It is concerning that sin that I do not tell him to make request." (1 John 5:16) So, it may well be asked, What prayers are rightly offered in behalf of "all sorts of men," and why?

In his letter to Timothy, the apostle Paul set forth the reasons for praying respecting "all sorts of men." First he encouraged praying for rulers "in order that we may go on leading a calm and quiet life with full godly devotion and seriousness." (1 Tim. 2:2) By reason of their authority, men in high governmental station can interfere with a Christian's "leading a calm and quiet life." If these men misunderstand the purpose of genuine Christianity and its message, they may impose legal restrictions on the activities of God's people and authorize severe penalties for engaging in true worship. So it is most appropriate to pray that rulers might be kindly disposed toward Christians so that these might not be persecuted for serving God.

Normally, it might be very difficult to reach men in high governmental positions with the Bible's message. Hence, it has served the purpose of Jehovah God and his Son to have Christians brought before these men for judicial investigation. For example, when calling Paul to be an apostle to the nations, Jesus Christ specifically indicated that he had in mind for this one to give a witness before rulers. We read: "This man is a chosen vessel to me to bear my name to the nations as well as to kings and the sons of Israel." (Acts 9:15) And Paul bore witness to kings by being brought before them to defend himself against false charges raised by opposers. Because the apostle Paul had Roman citizenship, he was able to make his defense before the highest earthly authority, the Roman Caesar.

The indications are that Paul's first defense before Caesar was successful in 'defending and legally establishing the good news.' (Phil. 1:7) Respecting his confinement in Rome at that time, he wrote to the Philippians: "I desire you to know, brothers, that my affairs have turned out for the advancement of the good news rather than otherwise." (Phil. 1:12) Truly, the prayers of fellow believers in behalf of Paul respecting his defense before the Roman Caesar were answered. (Eph. 6:18, 19; Col. 4:2, 3) Appreciating that the advancement of the "good news" is involved, Christians today rightly pray that judges and other men in authority might give favorable consideration to matters affecting true worship.

Continuing the discussion about praying "concerning all sorts of men," Paul wrote: "This is fine and acceptable in the sight of our Savior, God, whose will is that all sorts of men should be saved and come to an accurate knowledge of truth. For there is one God, and one mediator between

God and men, a man, Christ Jesus, who gave himself a corresponding ransom for all."—1 Tim. 2:3-6.

According to these words, it is right to pray "concerning all sorts of men" because Christ died for all. (1 Tim. 2:1) The atoning benefits of his sacrifice are available to persons of all races, nationalities, tribes and stations in life. There is the same God and the same mediator for all who come into a covenant relationship with God. The Almighty, as the apostle Paul pointed out to the Athenians, "is telling mankind that they should all everywhere repent." (Acts 17:30) Hence, we should never lose sight of the fact that Jehovah God does not want to destroy anyone but desires that individuals come to repentance. Our eagerness to share the "good news" with others and our prayers for fellow humans demonstrate that we appreciate this fact. So, when God's servants are brought before rulers it is also proper to pray that these men might be given a witness.

In view of the fact that Jehovah God wants as many persons as possible to be saved, Christians should certainly pray for fellow believers who may have slipped into sin and stand in danger of jeopardizing their salvation. The apostle John wrote in this regard: "If anyone catches sight of his brother sinning a sin that does not incur death [second death, from which no recovery is possible], he will ask, and he [God] will give life to him [saving him from the second death to which he would have been exposed had he continued in a state of unrepentance], yes, to those not sinning so as to incur death."—1 John 5:16.

However, there are times when a Christian would not pray for one who has ceased walking in the way of the truth. The apostle John continued: "There is a sin that does incur death. It is concerning that sin that I do not tell him to make request." (1 John 5:16) What is the sin that does incur eternal death, for which no forgiveness is possible?

This is the Scriptural answer: "Whoever speaks against the holy spirit, it will not be forgiven him, no, not in this system of things nor in that to come." (Matt. 12:32) "It is impossible as regards those who have once for all been enlightened, and who have tasted the heavenly free gift, and who have become partakers of holy spirit, and who have tasted the fine word of God and powers of the coming system of things, but who have fallen away, to revive them again to repentance, because they impale the Son of God afresh for themselves and expose him to public shame."—Heb. 6:4-6.

Such persons reject the sole basis on which their sin can be forgiven and so their transgression stays standing against them. Hence, they must pay the penalty for their unforgivable sin—second death. The Scriptures tell us: "If we practice sin willfully after having received the accurate knowledge of the truth, there is no longer any sacrifice for sins left, but there is a certain fearful expectation of judgment and there is a fiery jealousy that is going to consume those in opposition." (Heb. 10:26, 27) It would be wrong to pray for such persons, as they have knowingly and willfully rejected the only basis on which appeal could be made for them to Jehovah God. They have, as the Bible says, 'trampled upon the Son of God.' —Heb. 10:29.

So it would be wrong to pray for individuals who have deliberately and knowingly rejected God's provision to have their sins atoned for. Otherwise, in harmony with the Holy Scriptures, God's devoted servants should continue to pray "concerning all sorts of men," including erring members in the Christian congregation, that these might repent. Jehovah wants all to avail themselves of his provisions for salvation.—2 Pet. 3:9.

Watching the World

A Look Under Antarctica's Ice

◈ The Ross Ice Shelf, about the size of Spain, has long intrigued scientists. "There is hardly any place in the Earth's biosphere which rivals the isolation and uniqueness of the Ross Ice Shelf—not even the abyssal trenches or underground caverns," says scientist John Clough. Ice is 1,380 feet (420 meters) thick in this remote area. To penetrate this ice, scientists recently brought to Antarctica a drill that generates a supersonic jet of hot gas. Using this, they drilled a hole through the ice into the "lost world" of the sea below. What is it like at the bottom of the ice-covered sea? To find out, scientists lowered a television camera and a light through the hole to the sunless sea floor, about 660 feet (200 meters) below the ice shelf. The camera revealed that the sea bottom was apparently paved with sediment-covered small angular stones. Was there any sign of life? Yes, two crustacean-like sea creatures passed in view of the camera. There were other indications of life, such as tracks and burrows on the sea floor. "That indicates a rich bottom dwelling community of organisms," said Dr. Duwayne Anderson, chief scientist for polar programs of the National Science Foundation.

Success with an Artificial Heart

◈ An international team of surgeons at Switzerland's Zurich Hospital recently reported the first successful use of a "total artificial heart." It was used externally for a time. After a heart operation, a woman patient suffered a "very severe heart failure." The artificial heart was connected by tubes to the woman's natural heart in order to pump blood until the natural heart could return to normal. The surgeons had been prepared to leave the artificial heart connected for a week or longer, but it needed to be used only two days. The doctors stated that the woman would have died had not the artificial heart been used. "This was the first time," said Professor Marco Turina who performed the surgery, "that a total artificial heart successfully supplied both ventricles."

"Teeth Cannot Lie"

◈ An arsonist in Southport, England, ransacked an office, removed an apple from a desk drawer, took a single bite out of it and left. The fire that he set destroyed most of the building but left the office unburned and the apple as evidence. Police rushed the apple to the Liverpool home of John Furness, a leading authority on bite marks. Five days later they arrested the arsonist. The court held that bite marks are as valid for evidence as fingerprints and sentenced the man to three years in prison. "No two people's teeth wear in the same way," explains Furness. "Just as each blacksmith will use his hammer in a slightly different way, and a criminal will use his jemmy [a jimmy or crowbar] in a particular way, so no two people chew in the same way. Their teeth take on unique characteristics. People can lie through their teeth, but their teeth cannot lie."

Tallest Woman Stops Growing

◈ Twenty-two-year-old Sandy Allen of Shelbyville, Indiana, has been listed in the *Guinness Book of World Records* since 1974—as the world's tallest woman. She is now 7 feet 7¼ inches (2.32 meters) tall, but she thinks her growth has stopped at last. She recently had surgery to remove a tumor of her pituitary gland. Explains Miss Allen: "This tumor caused my pituitary to put out excess growth hormone. The doctors say it may have been with me my entire life and caused my height." The operation also removed part of the brain centers controlling taste and smell. Though she has regained much of her sense of smell, her sense of taste is poor. "It may be just as well," she added. "It's helping [me to] lose some weight. I'm down to 408 pounds [185 kilograms], more than 50 pounds [23 kilograms] less than in May. I think I don't eat as much because food doesn't taste as good."

Women and Lung Cancer

◈ Surveys reveal that increasing numbers of women are smoking with predictable results. For example, the Connecticut Cancer Epidemiology Unit recently reported that from 1945 to 1949 lung cancer in men was nearly five times as great as in women in Con-

necticut. The figure decreased to less than two to one by 1974. Then a new development in 1975—for the first time more women than men between the ages of 35 and 44 developed lung cancer!

Students Smoking Less?

◈ Among college students, at least, there may be fewer smokers. A Princeton University survey indicated that only about 7 percent of its undergraduates are smoking. Nine years ago, the figure was 45 percent. Harvard's freshman class had only 27 smokers out of 1,624 students. Why are smokers among college students apparently fewer than among high school students? "Students in a place like this are used to evaluating information and acting on it," said Princeton's director of health services. "They're aware of the long-term dangers of smoking, and even if they started smoking in high school, they've usually quit by the time they get here."

Garlic Without Odor

◈ Japan is marketing a new kind of garlic—an odorless strain. It took 66-year-old Toshio Nakagawa, a former rice farmer, 19 years to develop it. Each year he would take the least smelly garlics and replant them to propagate, until, finally, he came up with an odorless crop. Garlic experts told him that his crop would soon revert to the smelly strain. So he had to wait through six more crops and it was still as odorless as ever. Now the Mitsubishi Corporation will market the new strain, which may sell for about twice the price of smelly garlic.

Arson Epidemic

◈ The United States, says Senator John Glenn, is in an arson epidemic that is "virtually unchecked and unnoticed." At a hearing to alert the public to the danger, he stated that arson has increased over 400 percent over the past decade and that "an estimated 1,000 people, including 45 fire fighters, die each year in arson fires and 10,000 people are injured annually. Annual damage estimates are as high as $15 billion. Insurance losses exceed $3 billion." At the hearing one authority on arson testified that, in some places, arson is responsible for 50 to 55 percent of fire insurance premiums.

Department-Store Thefts Soar

◈ The National Retail Merchants Association, representing 30,000 department stores throughout the world, has compiled its latest statistics for shoplifting and employee stealing. The report shows that these thefts have doubled over the past 10 years—from $800,000,000 to $1,600,000,000 today. This is over 2 percent of the stores' yearly sales. Employee stealing accounts for about 60 percent of the loss.

Fashion Show for Homosexuals

◈ Chicago, Illinois, was the scene recently of a fashion show for homosexuals, sponsored by the Bonwit Teller fur salon in that city. About 400 persons paid the $2 admission price for the show at a homosexual nightclub, a few blocks north of the city's Loop. The show featured elegant men's and women's fur coats ranging in price from $1,500 to $75,000. Ten male models, including two female impersonators, displayed the fur coats amid an atmosphere of throbbing disco music. It was said that the proceeds of the show will go to help to build a "gay men and lesbian women center" in Chicago.

"Debugging" the Computer

◈ Computers on Japan's high speed "bullet" train running between Tokyo and Fukuoka are being "debugged." Recently, the computer recorded a speed of 130 miles (210 kilometers) an hour when the train was standing still in Nagoya station. The cause? A cockroach slipped into the speed measurement circuit. Management has ordered high-powered insecticide to "debug" the computer.

Life-Span in Greece

◈ Greece's National Statistics Service has disclosed that, on the average, Greeks live from 70 to 73 years. According to the report in the Athens *Daily Post*, the average Greek man lives 70.1 years and the average woman, 73.6 years. Back in 1897 the average life-span in Greece was only 36.7 years.

Dangers of Vasectomy and VD

◈ Dr. John Peter Blandez, professor of urology at London Hospital, England, warned about the dangers of vasectomy at a recent Urology Congress in Porto Alegre, Brazil. Besides being irreversible in most cases, vasectomy may produce profound mental anguish in a man and may even lead to madness, he stated.

The Urology Congress also disclosed that venereal diseases are on the increase in Brazil. Sérgio Aguinaga, president of the Brazilian Urology Society, called the situation "alarming," one requiring government attention. He also pointed out that it is no longer only the prostitutes who are prone to pick up venereal diseases, but any young girl can do so, due to widely accepted promiscuity.

Vanity

◈ In Japan a Tokyo group recently wrote letters to farmers flattering them and telling them that they were recipients of a gold medal and a citation. The farmers were asked to send 15,000 yen (about $50) to cover the postage to receive their awards. According to police reports, "quite a few" fell for it, and now have "fewer" yen in their pockets. Meanwhile, the police are looking for the group. As the Bible says: "Valuable things

resulting from vanity become fewer."—Prov. 13:11.

Top Ad Agencies

◈ Which ad agency does the most business? Japan's Dentsu Advertising. In 1976 the firm placed about $1,189,000,000 worth of ads. This put it ahead of the second-place American firm, J. Walter Thompson, by some $150,000,000. United States agencies took the next 13 places. In the list of the 10 top non-American agencies, Japan held eight spots, France one and Brazil one.

Advertising for Spies

◈ Major newspapers in Australia recently carried advertisements to recruit intelligence agents for the government, at a salary of $220 a week. The ad said: "Officers can expect to undertake duties directly related to the Australian Security Intelligence Organization's statutory responsibilities in regard to espionage, sabotage, and subversion including terrorism."

Deadly Weapons on TV

◈ How often do hand-held deadly weapons appear on TV's action programs? The U.S. Conference of Mayors, after a study of 73 hours of prime time action shows, recently reported that guns, knives and other deadly weapons appeared on TV an average of nine times an hour. The show "Hawaii Five-O" had the most appearances of weapons of any program surveyed —20.3 times per show.

Skateboard Injuries

◈ The Consumer Product Safety Commission recently reported that injuries from riding skateboards in the United States have jumped to more than 100,000 a year. At least 28 youths were killed riding skateboards. "Since all the victims killed by *falls* from skateboards struck their heads," said the Commission, "the use of helmets should reduce the risk of death."

Fewer Nuns and Priests in Brazil

◈ Each year more Roman Catholic priests and nuns are leaving religious orders in Brazil. The 1975-1976 *Anuário Católico do Brasil* reports that there were 13,292 priests between 1970 and 1971. In 1976 this number decreased to 12,065. Of the existing 339 Catholic institutions for women, 39 are threatened with extinction. Of these, some have only one, or at the most, five members left.