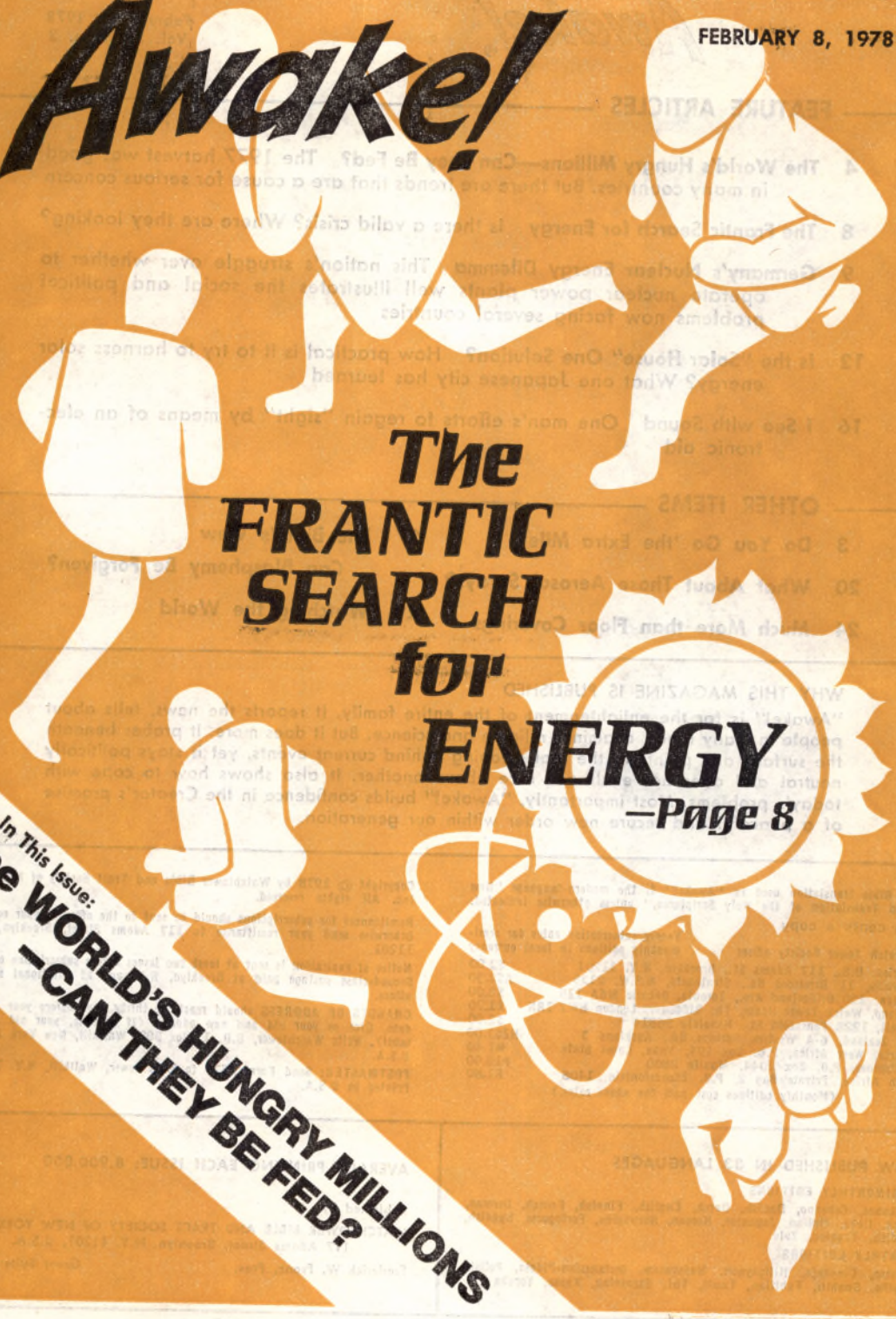
Awake!

FEBRUARY 8, 1978



The FRANTIC SEARCH for ENERGY

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Awake!®

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WHY THIS MAGAZINE IS PUBLISHED

"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.

The Bible translation used in "Awake!" is the modern-language "New World Translation of the Holy Scriptures," unless otherwise indicated.

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WHEN the neighbor's dog drank his baby's milk, a man in Nicaragua demanded compensation. But his neighbor became enraged and a knife fight resulted. The two men cut each other severely—all just because of the loss of a little milk.

This is typical of what can happen when people blow a small thing completely out of proportion. Often this leads to far greater loss to those concerned than if the original demand had been granted, or withdrawn peacefully.

Yes, many very serious problems would never develop if people were more willing to follow the principle of going 'the extra mile.' This is what the Bible encourages: "Do not resist him that is wicked; but whoever slaps you on your right cheek, turn the other also to him. And if a person wants to go to court with you and get possession of your inner garment, let your outer garment also go to him; and if someone under authority impresses you into service for a mile, go with him two miles." (Matt. 5:39-41) Consider how this counsel given by Jesus Christ could prevent difficulties over comparatively minor things.

A slap on the face is insulting and designed to provoke the one slapped. But would it really be to your advantage to retaliate? Rather, would not retaliation mean playing right into the hands of the one who wanted to start a fight? The wise course, then, is to 'turn the other cheek,' to disregard the insult. Generally this would end the whole thing.

You may know people who are bent on getting every personal advantage regardless of the expenditure of time and money. They make issues over trifles and insist that they must be vindicated. Would it be wise to get involved with them in lengthy and costly legal battles? Often it is better to take a loss and thus avoid getting embroiled in a maze of legal problems.

As far as an official or a supervisor is concerned, he may have the authority to request the performance of a particular service. Instead of protesting, the individual asked to do something usually is farther ahead by being willing to do what is required of him and even to do more than that. He thus avoids needlessly incurring the displeasure of those in authority.

Now, in the case of the two men in Nicaragua, likely neither one of them would have been scarred for life had there been a willingness to make compensation or to take a small loss. This is well illustrated in what happened to two women attending a Christian assembly in the same country. One of them accidentally knocked over a bottle of milk that the other woman had bought to feed to her baby. She quickly cleaned everything up and, when the other woman returned to her seat, offered to pay for the spilled milk. But the owner had no interest in compensation, and the two women soon were engaged in pleasant conversation.

Truly, the person who gains is the one who avoids making issues over trifles and really goes beyond what is asked of him to settle matters peaceably. There is real wisdom in being willing to walk that 'extra mile.'

The WORLD'S HUNGRY MILLIONS—

By "Awake!" correspondent in the Philippines

THE problems of the hungry peasants of Asia and Africa were very much on the minds of those attending a group meeting in the Philippines during June of 1977. Starving millions might have been delighted to hear the optimism expressed in some of the speeches.

The conference was the third session of the World Food Council. This Council is described as "the highest political body on food matters in the United Nations." What is its goal? "That within a decade no child will go to bed hungry, that no family will fear for its next day's bread, and that no human being's future and capacities will be stunted by malnutrition."

What motivated us to be at the conference in the role of observer? First, hunger is a scourge for an eighth of the human race, and every compassionate person should be concerned about this. Secondly, the problem to be discussed related to Bible prophecy. Jesus foretold that these days would be marked by "food shortages." (Mark 13:8) The very need for this conference illustrated the fulfillment of his words.

CAN THEY BE FED?

Finally, we were aware that many people look to the United Nations as man's best hope for the future. They feel that only a supranational approach to the world's difficulties can possibly overcome them. So we wanted to see how this organization worked to tackle a specific problem, one so severe that the United States delegate was moved to say: "Unless we, as people and nations working together, can assure an adequate diet for all people, our other economic and political goals become meaningless . . . 'a peaceful world cannot long exist one-third rich and two-thirds hungry.' "

An International Approach

On Monday morning, June 20, 1977, along with delegates from 36 countries, visiting dignitaries, observers and many others, we attended the opening ceremonies of the conference in the air-conditioned luxury of the Manila Conference Center. Looking around the hall, one saw delegates from rich and poor countries, from the East and the West. This was truly an international effort in trying to solve the food problem.

Of course, the Council had no power to pass laws that would be binding on member nations. Rather, what we witnessed was a political institution working to formulate plans that it felt would be effective. Then it would try to influence member governments to follow these plans, using the political weight of the United Nations.

Grounds for Optimism

Striking an optimistic note, the Philippine delegate, who was elected president of the Council, stated: "In a world where it has become fashionable to despair, we today have hope. We are met at a time when harvests have been good, when stocks are abundant. We can exult in the establishment of a billion-dollar Fund for Agricultural Development. More and more of the leaders of the world are accepting the stark fact that hunger and poverty are the main concerns of our age."

Yes, in spite of some droughts, good harvests had resulted in stocks of about 50 million tons in excess of immediate needs. In fact, although the population had greatly increased, it seemed that there was one fifth more food available, on the average, for each person today than there had been back in 1950.

Big Problems

However, there were some grim warnings. On the *average,* the situation looked good. But millions upon millions of starving or malnourished people were not getting their share of available food. This brought to mind the illustration of the man who had his head in the oven and his feet in the refrigerator. His *average* temperature was perfect!

Hence, even with plenty of food available, people can be hungry due to distribution problems between countries and within a particular land. For example, prior to the conference, Doctor Bihar of the World Health Organization observed that some countries with malnutrition problems actually were exporting food. The poor in those lands did not have the money to buy the food, even though it was available.

The Canadian delegate sounded a warning about the surplus, which had been mentioned as a cause for optimism. He explained that farmers were not going to grow more food than the market could absorb. If there was a glut in wheat, for example, prices would plunge. Farmers would be discouraged from planting so much and this could result in shortages. There was a need for an arrangement to protect the farmer against low prices in times of plenty and to safeguard the importing nations from receiving inadequate supplies in years of bad harvests.

In view of what has happened since then, the Canadian delegate's warning was indeed appropriate. A bumper wheat crop in the United States, for example, has led to the proposal that in 1978 farmers take 20 percent of their present wheat-growing land out of production.

The Crisis of 1972

Looming in the back of most delegates' minds was the specter of 1972—the year of crisis that eventually prompted the creation of the World Food Council. Prior to that year, world food production gradually had been increasing. Although there had been isolated problems, a poor crop in one country could be compensated for by a bountiful harvest somewhere else. In 1972, however, bad weather brought about poor harvests in China, the Soviet Union, southern Asia and the Sahel region of Africa. Suddenly, the world's food supply was 33 million tons short of what was needed. The price of wheat almost tripled. Charter rates for ships rose sharply. In many countries people faced actual starvation, and all suffered from price increases. For the first time, it was clearly seen just how delicate the world food situation had become.

This crisis finally led to the World Food Conference, held at Rome in November of 1974 under the auspices of the United Nations. There, several resolutions were passed, and the World Food Council was established to assist in carrying out the aims of the resolutions and to work at alleviating the global food problem.

Since then, however, progress has been slow. Few fundamental improvements have taken place. A goal for food aid to poorer countries has not been reached. The recommended growth rate of food production in poor nations has not been attained. There has been little progress in solving the problem of malnutrition. International trading policies still seem to work against the poorer countries.

A Trend for Serious Concern

Another grim reality faced the delegates. Forty-three lands were identified as having outstanding problems. These were called "food priority countries." Before World War II, however, many of these nations were producing so much food that they exported their surpluses. Even up until 1950 they were producing enough to feed themselves. But then that situation changed. They could not feed themselves. Why? This was due partly to rapidly increasing populations. Also, these lands shifted investments from agriculture to industry, and many farm workers moved to the cities.

So, food-exporting countries started to import food. At first this was not difficult. The richer nations were experiencing increases in grain production. They would often sell their surpluses to the poorer countries at low prices or make food available in the form of grants. By the late 1960's, these poorer nations were importing between 25 and 30 million tons of grain. In 1975, the figure was over 50 million tons, and it could go as high as 85 or even 100 million tons by 1985! This would present a real problem, for the poorer countries could not afford to buy so much food. Moreover, even if they could

In Future Issues

- **Mercy Killing—What Do Lawyers Say?**
- **Is "Speaking in Tongues" for Today's Christians?**
- **How Well Do You Manage Your Affairs?**

do so, it is doubtful that enough ships would be available to transport it.

Further complicating the problem is the tremendous amount of money being spent on armaments, funds that could be used to feed earth's hungry millions. It is noteworthy that the original resolution of the World Food Conference had called for a reduction in spending on armaments. However, this resolution, too, has seen little action since 1974.

A Plan of Action

After five days of discussions, the World Food Council came up with a comprehensive plan comprised of 22 points. Some of the measures were designed to build up food production in the poorer countries, thus eventually making them self-sufficient and ending the growing problem of importing food. Others handled the immediate problem of food shortages in the "food priority countries" and aimed at making food aid more regular and effective. Difficulties regarding nutrition and trade imbalances also were handled.

Another recommendation was the creation of an international grain reserve. This arrangement would serve to promote world security in food, preventing a catastrophic repetition of the 1972 situation. It would encourage farmers to keep producing food even in times of plenty. Thus, food could be stored during periods of abundance, to be used in times of shortage.

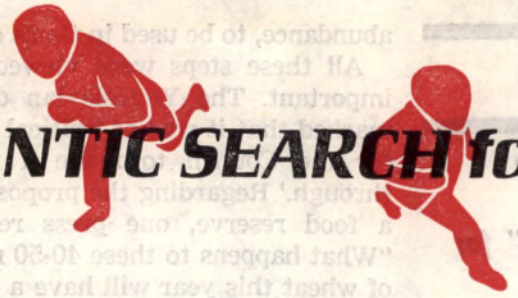
All these steps were viewed as highly important. The Yugoslavian delegate remarked that it was of 'critical importance for the Council to make a real breakthrough.' Regarding the proposal to set up a food reserve, one press release said: "What happens to these 40-50 million tons of wheat this year will have a greater impact upon world food security than *any* other single event within the control of man and within the power of the World Food Council to influence."

The Hungry Will Be Fed

The results of the conference will only be seen in time. It could bring about benefits for countless millions of hungry people. But many obstacles stand in the way. There are, for example, such factors as the possibility of bad harvests, continued population growth, inefficiency in some national governments and slow erosion of arable lands that can be used for agriculture. These are things over which the World Food Council has no control.

As we listened to the experts at the conference, we realized that the people the delegates were trying to help doubtless were completely unaware of these discussions. It was also apparent that the experts here gathered either were unaware of or were failing to consider the permanent solution to the problems discussed at the conference. The Bible identifies Jehovah God as the one making "vegetation [grow] for the service of mankind." And he it is who promises to give "bread to the hungry ones." (Ps. 104:14; 146:7) The very food shortages that the Council discussed are part of the evidence that soon now, by means of his kingdom, Jehovah God will bring about a new system that will not be marked by such problems as food shortages. At that time God 'will open his hand and satisfy the desire of every living thing.'—Ps. 145:16; Matt. 24:3, 7.

The FRANTIC SEARCH for ENERGY



"THE scope is nothing we can even imagine. . . . Almost surely it will bring about tremendous social chaos, in the developed countries more than elsewhere." With these words oceanographer Jacques Cousteau spoke recently of a "drastic energy crisis in the 1980's."

On the other hand, many others can produce charts and statistics indicating that our earth still contains enough oil, coal and other resources to provide energy and provide it in abundance. Obviously, in reading about the "energy crisis" one soon realizes that there is disagreement and confusion.

But Why the Confusion?

Is there a valid crisis? Surely we can find out if we are running out of energy, can't we? A housewife knows when the cupboards are bare. Why is it seemingly impossible to get a simple answer to this question of energy reserves?

Because the problem is not a single problem, but a combination of problems. The proposed solutions likewise are numerous. As one energy expert put it, the causes of the "crisis" are "partly physical, partly political and partly economic."

Further, many solutions depend upon "Ifs." *If* there is growing cooperation among nations, *if* man can develop a way to get energy economically from this or that source, *if* it can be transported and distributed where needed—then we have an answer. Theoretically much is possible; in reality, the choices may be few.

In today's world if a nation has cheap energy it can give greater economic security to its people. Many scientists believe that a whole way of life for hundreds of millions of people is at stake. As one U.S. energy official put it: "There will be no time for experimenting when the oil runs out."

In addition, however, a nation that has energy has political and economic power over other nations. The frantic search for energy has more than one motive.

To understand the complexity, we might consider just one energy source—crude oil. Rich, black oil looked like the solution to man's energy needs on into time indefinite. But not so today. Why not? Because while there is still much oil within the earth, these deposits are not equally distributed. Most of the oil is in the Arabian peninsula and within the Soviet Union. So, a small number of nations can drastically affect the world's economic balance by adjusting the price of oil. Large and powerful nations fear being economically manipulated because of their dependence on oil.

One answer is to develop other energy sources *within their national boundaries.* However, technology must be advanced so as to locate and efficiently use these. When we read the "fine print" of these conflicting views over new sources we discern that, in many cases, the energy potential is there but man does not know at present how to draw it out and economically "put it to work." No one wants to buy power at many times its present cost.

Where Are They Looking?

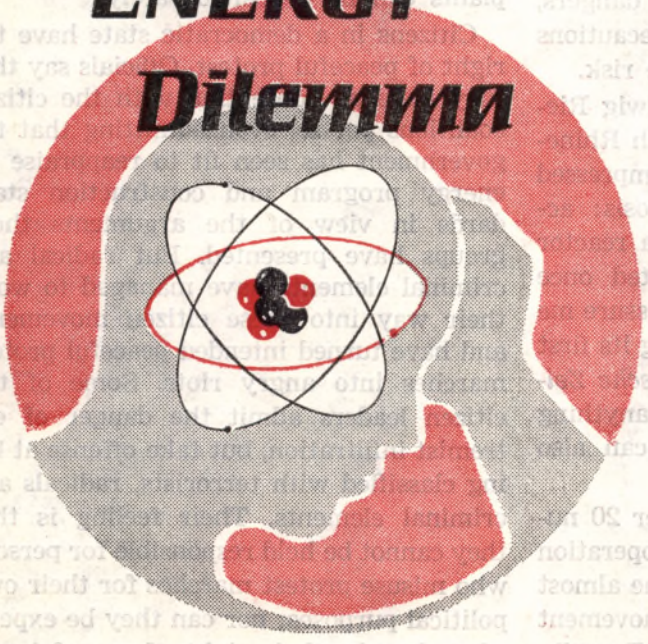
Here are just a few of the experimental or limited energy systems being developed:

- Several countries are investigating geothermal heat, that is, heat from within the earth. (See "Awake!" of January 8, 1978.)
- Nuclear fusion—not the same as present nuclear power plants (which split the atom). It is a fusing of the nuclei of two elements, creating a powerful burst of energy. Problems: Technology is extremely complex; the present cost is high. A projected date for a "commercial reality" is the year 2000.
- A renewed interest in coal, especially in turning coal into a gas or liquid fuel.
- Windmills and devices to "harness" the tides show 'great promise' but need further development to be practical sources.

In addition to the above, there are two other prominent sources for power now being developed by several countries. They are: nuclear power plants (fission) and solar (sun) power.

The problems and possibilities of these will be discussed in the following articles by *Awake!* correspondents in Germany and Japan. Although reflecting local situations, these reports give us a further look at our world's struggle over energy.

Germany's NUCLEAR ENERGY Dilemma



By "Awake!" correspondent in the Federal Republic of Germany

NUCLEAR WAR! Who is not horrified at the very thought of it? The rapid collapse of Hitler's forces in the spring of 1945 may well have been the thing that prevented Germany from getting the dubious distinction of being the first country struck by nuclear war. But now, over 30 years later, this country has been hit by something that leading German newspapers and magazines are likening to an "atomic war" of another kind, a serious one that may have far-reaching consequences.

About the only thing everyone agrees on is what this "war" is all about: the peaceful use of nuclear energy. So it's a "peaceful atomic war," if you will. But with that, agreement ends and dissension begins. Is it

advisable and necessary to build nuclear power plants in the first place? If so, are construction requirements sufficiently high to ensure safety? What about disposing of radioactive waste? Is it wise and desirable to sell nuclear plants to other countries? What are proper methods to prevent possible terrorist misuse of nuclear know-how?

Man has been successful in splitting the atom, but he has not succeeded in preventing this knowledge from splitting the unity of his society and that of his governments. "Nuclear Energy Splitting Our Land," warned the February 25, 1977, front-page headlines of the newspaper *Die Zeit*. Could it be that the atom is out for revenge?

To Build or Not to Build?

Proponents of nuclear power plants argue that additional energy sources are vital to guarantee the nation's industrial capacity. They say that no alternative to nuclear power is presently available. While admitting the existence of certain dangers, they stress that necessary precautions have been taken to minimize the risk.

On the other hand, Horst-Ludwig Riemer, Economics Minister of North Rhine-Westphalia, stated: "I am not impressed by the constantly recited prognosis: according to the law of averages, a reactor malfunction can only be expected once every 10,000 years. Nobody can assure me that this might not happen during its first year of operation." The *Süddeutsche Zeitung* agreed: "In principle, if anything can happen sometime, then it can also happen now."

The names of three of the over 20 nuclear power plants either now in operation or under construction have become almost synonymous with the protest movement —Wyhl, Grohnde and Brokdorf. Describing violent clashes between protesters and police at Brokdorf in November of 1976, the *Hamburger Morgenpost* spoke of "wartime action." *Stern* magazine called it "the civil war in Brokdorf," and went on to say: "The atomic war is being fought on green meadows—with conventional weapons. Its radiation does not kill, but the shock waves radiating out from the most brutal floggings to take place since the student unrests of 1968 are also poisonous —poisonous for politicians. Those who persist in following a policy of bludgeoning their critics, instead of listening to them, are turning the democratic state into a police state."

Citizen coalitions, organized to halt additional construction of nuclear power plants, argue that less dangerous alternatives are available to ensure an ample supply of energy. They protest with such catchy slogans as "Better active today than radioactive tomorrow," or "Nuclear energy to be dead sure." They also raise the question of where atomic waste from these plants can be deposited safely.

Citizens in a democratic state have the right of peaceful protest. Officials say that they have no contention with the citizen coalitions per se, even admitting that the government has seen fit to reappraise its energy program and construction standards in view of the arguments these groups have presented. But radical and criminal elements have managed to work their way into these citizen movements and have turned intended peaceful protest marches into angry riots. Some of the citizen leaders admit the danger of extremist infiltration, but take offense at being classified with terrorists, radicals and criminal elements. Their feeling is that they cannot be held responsible for persons who misuse protest marches for their own political purposes; nor can they be expected to forsake their right of peaceful protest merely to prevent such misuse. Be-

sides, they maintain, the police at times have overreacted and employed authoritarian tactics.

Leading politicians disagree on how to solve the problem of protest. *Die Zeit* headlined an article on this subject with the observation: "Cabinet Is Split." So are the courts. Whereas one court ruled to halt further construction on a reactor, less than a month later another court said that work on a second plant could continue. In both cases essentially the same issues were involved. Hence, the question remains, To build or not to build?

To Sell or Not to Sell?

Back in 1975 the Federal Republic of Germany agreed to sell Brazil eight nuclear reactors, a uranium enrichment plant and a nuclear fuel reprocessing plant. This was strongly opposed by the United States. Despite opposition, the German government went ahead with its plans, finalizing them in April of 1977. The result has been tension between two powerful members of NATO, the North Atlantic Treaty Organization. How paradoxical that the use of nuclear power in peacetime should threaten the unity of an organization set up to prevent its possible misuse in wartime!

Curbing the Terrorist Threat

Another factor that has come into the picture is the possible misuse of nuclear energy by terrorists. Germany has had its share of terrorist activity during the past few years. Hence, there is a nagging fear that terrorists might in some way obtain fissionable material with which to construct an atomic bomb. Although admittedly difficult, this is by no means impossible. Just how far should the government be permitted to go in taking preventive measures? Would it be justified in using even illegal and unconstitutional methods?

Pointing up the relevancy of such questions were news reports in March of 1977 that Klaus Traube, a German nuclear scientist, had been the victim of illegal government wiretapping. He was suspected of having terrorist connections, and out of fear that through him nuclear know-how might fall into the hands of terrorists, the government broke its own laws restricting wiretapping.

This revelation set off a chain reaction that brought still another disturbing fact to light. The government admitted that during 1975 and 1976 private conversations between the now convicted ringleaders of the Baader-Meinhof terrorist group and their lawyers had likewise been illegally recorded. Out of fear that her conversations would be recorded, Ulrike Meinhof, who committed suicide during the course of the two-year-long trial, had at times refused to talk to her lawyers, insisting upon communicating in writing instead. Although this event had no direct connection with the nuclear problem, the fear of terrorist misuse of nuclear know-how is what had brought it out into the open. It doubtless also widened the "credibility gap" between the government and its citizens, making a meeting of minds on the subject of nuclear energy more difficult to achieve.

Casualties

Casualties in wartime generally are counted in the thousands or millions of killed, injured and missing, and a war with no deaths would be a minor one indeed. While no deaths can as yet be directly attributed to Germany's "peaceful nuclear war," there exists the possibility of future fatalities. At Grohnde, 20,000 nuclear power opponents and 4,000 policemen battled with clubs, chains, iron bars, Molotov cocktails, tear gas and water cannons, leaving upward of 300 persons seriously injured. Such confrontations could easily bring about a number of deaths. Also, if some malfunction were to release radioactive

material, as protesters fear, there could be many casualties.

In a sense, even the government has become a casualty. Increased friction has tended to weaken democratic processes inside the nation as well as its international alliances outside. The judicial victories won by citizen coalitions and the publicity they received have done much to increase the power of such coalitions and to broaden their base of operation. A temporary halting of construction work at Grohnde, for example, was ordered less than three months after the riots there. This has given rise to the fear that citizen coalitions might become so strong as to interfere with the proper functioning of government. Were that to happen, chaos would reign.

No wonder the average citizen is worried! He is concerned about possible loss of freedom and government breakdown. On the other hand, he is worried about nuclear proliferation, radioactive pollution and terrorist misuse of nuclear power.

This dilemma is but one of many facing people today in various parts of the earth. Obviously, new answers are needed. Is solar energy one of them?

Is the "Solar House" One Solution?

By "Awake!" correspondent in Japan

THE bright-red disk on a white background that serves as the national emblem of Japan is also a silent reminder of the time when the sun was worshiped throughout this land as the goddess Amaterasu Omikami. In recent times, Japanese attention once again has been directed heavenward, but this time in search of a reasonably priced source of energy.

Actually, for many years solar water heaters have dotted the roofs of tens of thousands of Japanese homes. However, it was not until the oil problems of 1973 and accompanying threats of energy rationing that serious attention was given to the use of solar energy on a scale larger than for private homes.

Along these lines, a notable step was taken at Numazu City, Japan, which has a population of more than 203,000 and is located between the foot of Mount Fuji and the sea. Officials and engineers there decided to decrease the city's consumption of oil and electricity by using energy from

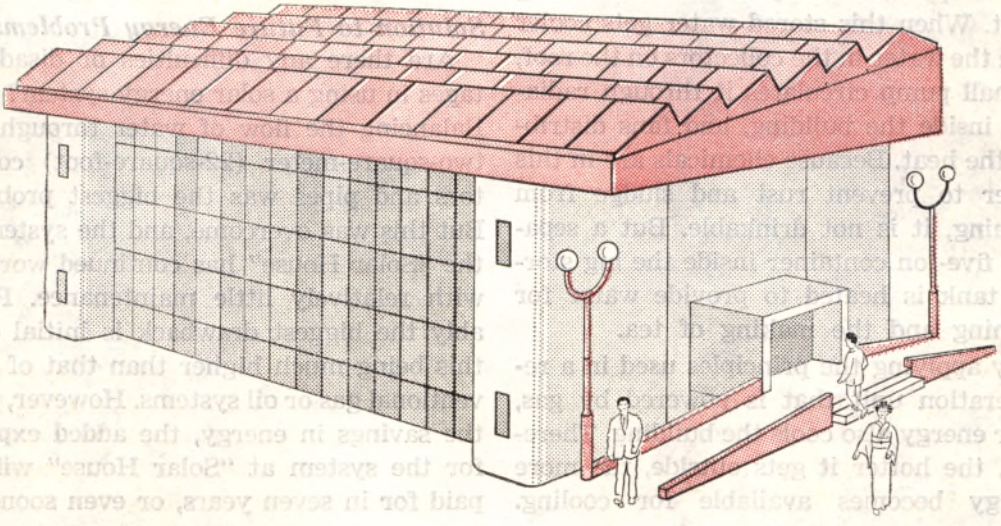
the sun. The first practical result was the construction of the new Kanaoka Hall and City Office Annex, appropriately called *Taiyo no Ie,* that is, "House of the Sun" or "Solar House." During its first year, this building saved Numazu City $5,000 just by using the sunshine that fell on the roof. Would you like to know more of the details that make this 'sun house' a success?

Tapping the Sun's Energy

It is said that the earth receives 20,000 times as much energy from the sun as humans use. So the potential of this energy source is obvious. The two main hindrances to using solar energy are: (1) it is not continuous (the earth's rotation and cloud cover causing interruptions), and (2) the low intensity necessitates large collector areas to harness the energy.

The many different systems being considered to harness the sun's energy range from simple reflector cookers that can boil a liter (about 1 quart) of water in 20 minutes to photovoltaic cells (usually made of silicon) that convert the solar energy directly into electricity. In southern France, a large solar furnace using 3,500 small mirrors focused on a central point produces temperatures as high as 2,980 degrees Celsius (5,396 degrees Fahrenheit). Some scientists advocate placing collectors in orbit and sending the energy (in the form of microwaves) to large receivers on earth. Others feel that the electrical needs of the United States can be met by placing solar energy collectors in a vast area of desert land and then using that energy to produce steam for turning turbines.

Yes, there may be many ways of harnessing the sun's energy, although much more research needs to be done before most of these methods can be put to use on any large scale. However, the system at "House of the Sun" already is in operation, saving money and resources by using the pollution-free energy of the sun. It has been so successful that Kyohiko Watenabe, assistant head of the Home Building and Repairs Department of the



Environmental Bureau in Numazu, feels that within three years similar systems will be required on all new government buildings.

Instead of waiting until a total solar energy system was perfected, Numazu City officials decided to use what already had been developed. The system is simple, but operates at 30 percent efficiency. It collects enough energy each sunny day to heat or cool the two-story building with 716 square meters (7,707 square feet) of floor space, and to provide hot water for washing and for making tea. When it is rainy or cloudy, an auxiliary boiler may have to run one day in three. Nevertheless, getting two thirds of the heating energy from the sun in a country that has to import 98 percent of its oil certainly is a noteworthy step. How does this "House of the Sun" harness the energy of its namesake?

Two hundred and twenty-four collectors are lined up on the roof, all of them lying at a 25-degree angle to catch the direct rays of the sun. Each collector has a glass cover to let the light pass through. Water circulates through small black tubes inside, where it is heated. This heated water flows into a 20-ton storage tank, where the temperature may reach the boiling point. When this stored water gets cooler than the water in the collectors on the roof, a small pump circulates it through radiators inside the building, and fans distribute the heat. Because chemicals are in this water to prevent rust and sludge from forming, it is not drinkable. But a separate five-ton container inside the big storage tank is heated to provide water for washing and the making of tea.

By applying the principles used in a refrigeration unit that is powered by gas, solar energy also cools the building. Therefore, the hotter it gets outside, the more energy becomes available for cooling. Walking into the "Solar House" on a very hot summer day and finding that the inside temperature is 25 degrees Celsius (77 degrees Fahrenheit) is convincing proof that there are practical ways of utilizing solar energy.

"Solar House" in Numazu is a practical example of utilizing an abundant source of energy, one that is especially usable between 35 degrees north and 35 degrees south latitude. Numazu officials were so convinced that they had taken a step in the right direction that a solar heating and cooling system was installed in a new nursing home in the Ashitaka Mountain area of the city.

The floor space of this new home is twice that of "Solar House," and so its solar energy system's capacity is more than double that of the "House of the Sun." Five hundred and twenty-two collectors on the roof provide energy for heating and cooling the home, as well as furnishing hot water for tea and bathing. Because an extra 100 square meters (1,076 square feet) of collector area was provided for possible future expansion, the efficiency of this unit is 37 percent and energy can be stored for later use.

Solution to Future Energy Problems?

Are there any difficulties or disadvantages in using a solar energy system? Yes. Balancing the flow of water through the two-square-meter (22-square-foot) collectors and pipes was the biggest problem. But this was overcome, and the system at the "Solar House" has continued working with relatively little maintenance. Probably the biggest drawback is initial cost, this being much higher than that of conventional gas or oil systems. However, with the savings in energy, the added expense for the system at "Solar House" will be paid for in seven years, or even sooner if

the price of oil continues to rise. The nursing home at Ashitaka cost an extra ¥18,500,000 (US$61,667) to build, but it is estimated that this expense will be recovered in 4.2 years of operation. Why is this so? Because energy expenses for heating and cooling are ¥750,000 (US$2,500) a year at Ashitaka, but in a comparable facility also housing 50 persons and using conventional systems, the yearly cost is ¥5,200,000 (US$17,333).

So what impression has the "House of the Sun" made on us? First, it has taught us to look at solar energy realistically. This is not a total energy system. Electricity is required for the lights and office machines, as well as the pumps and fans connected with the solar system. Also, if it rains or is cloudy, the auxiliary boiler must be used. (This is not an independent system, but merely heats the water in the solar energy system.) On the other hand, when the sun is shining, which is about two thirds of the daylight hours, the energy that otherwise would be reflected back into the atmosphere or absorbed by the roof is being put to work through a virtually nonpolluting system.

Secondly, the fact that a city was willing to break away from the normally accepted means of heating and cooling impresses us with the need to evaluate the way the earth's resources are being used. Many people fear that at the present rate, the fossil fuels will be used up in a relatively short time. However, due to the convenience of burning such fuels, people are slow to adopt new methods that may require adjustments in their energy consumption or a greater initial investment, even though these may have better long-range prospects.

Thirdly, reliance on solar energy helps to build appreciation for simpler things and those that we may have taken for granted. Interestingly, the city engineer who showed us around the "Solar House" said that until these buildings were constructed, he never really had appreciated what it means to have the sun come up every morning. Just think about that for a moment. If the sun were not shining, the temperature everywhere on earth would be minus 240 degrees Celsius (–400 degrees Fahrenheit).

Even without rooftop collectors, solar energy affects our lives in many ways. By means of light from the sun, plants change carbon dioxide from the air and hydrogen from water in the soil into carbohydrates that become our food. Wind is an indirect form of solar energy, for the heating and cooling of land masses and the atmosphere cause the breezes to blow. Every day, heat from the sun evaporates from the earth the vast amount of water that later falls as rain or snow. When that water is collected into rivers and reservoirs, man can tap the sun's stored energy by means of waterwheels and hydroelectric generating systems.

Every year the earth receives 700 quadrillion kilowatt-hours of energy from the sun. Yet that fantastic amount is but a minute fraction of the sun's total output because it shines outward in all directions. To what extent man in the future will be able to harness this virtually unlimited supply of energy remains to be seen. But that he can—if he chooses to do so—put solar energy to practical use becomes evident when we consider modern buildings such as the "House of the Sun."

I SEE WITH SOUND

FOR over 30 years I have lived in a world of darkness. I am one of over 30,000 persons in Canada afflicted with blindness. Yet today, with both my eyes removed and light completely cut off, I love to tell my friends: "I can see now! I can see with sound!" Let me explain how my condition came about.

World War II was reaching its climax. The Allied armies had pushed across France into the Netherlands, and the battle of Antwerp was at its height. At 19 years of age, I had just been transferred from driver-mechanic with a Canadian artillery regiment to the infantry. November 1, 1944, was my first day in front-line action. After only five minutes, it proved to be my last. My unit was advancing along a dike toward Antwerp when, suddenly, a mortar bomb exploded in my face.

After regaining consciousness and despite being severely wounded, somehow I made it back to our own lines, where I collapsed unconscious. Seventeen days later I awoke in a hospital in England almost totally blind. What sight there was in my left eye produced only blurred images. My right eye was so badly damaged that it had to be removed. After three months in the hospital, I was released. Soon, what vision there was in my left eye disappeared, and a world of blackness became my lot.

In June 1945, with the European war concluded, I was shipped back to Canada to begin building a new life without sight. It was also necessary to learn to talk again because the explosion had shattered the lower part of my face. The doctors were able to rebuild my features by plastic surgery, for which I was very grateful.

It was strange to have to learn to get about by means of the God-given sense of touch. Truly amazing is the way that the fingertips become extra sensitive as the wonderful mechanism of the body endeavors to make up for the loss of vision. It did not take too long for me to learn to move around by just feeling for objects and also by using a long cane. Not until 1974 was I able to obtain a Seeing Eye dog. This dog, Leland, has been a faithful companion ever since.

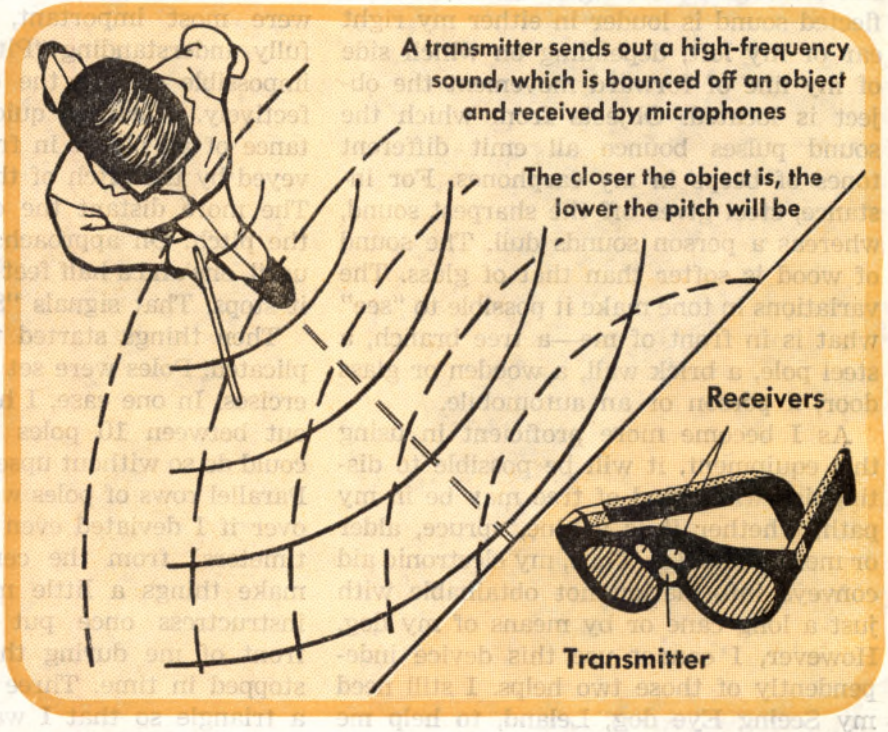
A Change in Outlook

Back in 1954 a message was brought to me that changed, not only my thinking, but my whole way of life. Two very kind people called at my door and, from God's Word, the Bible, they began to teach me about a marvelous future for mankind. I learned that Jehovah God's kingdom in the hands of his Son, Christ Jesus, will forever

remove from this earth all the pain, suffering and sorrow caused by war, violence and oppression during the past 6,000 years.

Under Kingdom rule, not only will 'the ears of the deaf be unstopped and the tongue of the speechless one cry out in gladness,' but 'the very eyes of the blind ones will be opened'! (Isa. 35:5, 6) What a prospect! The best part of this is that, according to God's promise, it will begin to be realized within this generation. —Matt. 24:7-14, 32-35; Luke 21:28.

Even while awaiting that wonderful new system, I knew it was necessary for me to make the best of my present circumstances. Hence, when it was brought to my attention that a New Zealander had designed a device now being used with success by many sightless persons, I decided to investigate its possibilities. Thus I became the first blind person in Canada to receive training in the use of an electronic aid for the sightless. This device literally helps me to "see with sound."



What Is It?

If you were to see me walking down the street wearing my device, you would conclude that I was simply wearing a slightly oversized pair of eyeglasses. The three small screened openings you would see are the transmitting and receiving sensors. While the central lower sensor transmits, the two upper ones are receivers. As the transmitting sensor bounces high-frequency sound pulses off objects in my path, the echo is picked up by the receivers and is interpreted as "beeps" in the earphones contained in the glasses' thicker-than-normal sidearms that hook over my ears. One sidearm plugs into a control unit/power pack attached to my belt. This hand-sized control box contains not only the rechargeable batteries but all the electronic equipment necessary for efficient operation of the glasses. For every four hours of use the batteries must be recharged for 14 hours. Along with the battery charger, all this equipment fits into a compact carrying case having a shoulder strap for the times when it is not in use.

How Does It Work?

Undoubtedly, you have learned about one of the marvels of Jehovah's creation, the

bat. This creature is endowed with a system of sound emission and hearing par excellence. Regarding its echolocation system, one writer said: "Scientists estimate that, ounce for ounce and watt for watt, the bat's sonar is a billion times more sensitive and efficient than any radar or sonar device contrived by man."

My electronic aid operates on the same sonar or echolocation principle. The transmitting sensor of my device radiates high-frequency sound pulses into about 20 feet (6 meters) of my surroundings. The receivers are deflected slightly, one to the left and one to the right. Hence, the reflected sound is louder in either my right ear or my left, depending on which side of my line of forward movement the object is located. Objects from which the sound pulses bounce all emit different tones of beeps in my earphones. For instance, steel gives off the sharpest sound, whereas a person sounds dull. The sound of wood is softer than that of glass. The variations in tone make it possible to "see" what is in front of me—a tree branch, a steel pole, a brick wall, a wooden or glass door, a person or an automobile.

As I become more proficient in using this equipment, it will be possible to distinguish what kind of tree may be in my path, whether it is a pine, spruce, alder or merely a hedge. Thus, my electronic aid conveys information not obtainable with just a long cane or by means of my dog. However, I cannot use this device independently of those two helps. I still need my Seeing Eye dog, Leland, to help me to detect holes and drop-offs or when I descend stairs. Nevertheless, combining the use of my dog and my electronic aid certainly has extended my mobility, resulting in more confident and safer travel.

Training and Instruction

Because we humans lack the bat's instinctive abilities, the sightless person using an electronic aid needs much training in order to interpret its "language" correctly. Toronto was the site for my four-week training period. My instructress was one of approximately 100 persons who have been trained during the past three years to conduct such courses in Australia, Britain, the United States and Canada. So far, 400 visually handicapped people, including children, have been taught to "see with sound."

A blind person needs to know how far away he is from objects that he might encounter. So the first drills given me were called "Pitch-Distance exercises." These were most important, because without fully understanding "Pitch-Distance" it is impossible to use the electronic aid effectively. I learned quickly how the distance of an object in front of me is conveyed by the pitch of the reflected sound. The more distant the object, the higher the pitch. On approach it becomes lower until, one and a half feet (.46 meter) away, it stops. That signals "STOP" for me.

Then things started to get more complicated. Poles were set up for various exercises. In one case, I had to walk in and out between 10 poles in a row until I could do so without upsetting any of them. Parallel rows of poles were easily knocked over if I deviated even an inch (2.5 centimeters) from the center line. Just to make things a little more complex, the instructress once put a pole right in front of me during this exercise, but I stopped in time. Three poles were set in a triangle so that I was exactly 15 feet (4.6 meters) from each of them. The challenge here was for me to walk to each pole, touch it with my hand, and then return to my original position. One blunder—I missed one pole by 18 inches (.46 meter)!

More advanced training took me out onto Toronto's busy streets. My instructress, walking behind me, wore a device

allowing her to hear the identical sounds that registered in my electronic aid. Now I became aware of the real value of my training with the poles. The reflected beeps came from much more solid objects such as telephone and light poles, as well as mailboxes, parked motor vehicles and pedestrians. Besides having to avoid them, each had to be identified. Patiently, my instructress guided me through this kaleidoscope of sounds, and I began to "see" things more clearly.

Eventually I learned to distinguish store fronts and their entryways. It became possible to count the store entrances on a block. To test my skill, I was told to go to a bank that was a certain number of entrances from the end of a block. Bravely, I started off and turned in at what I thought was the bank. I walked confidently up to what seemed to be the counter and —CRASH!—400 dollars' worth of lamps in a furniture store went tumbling to the floor! Fortunately, the damage was fully covered by insurance. Since then, as you can well imagine, I have been much more cautious.

One of the most difficult parts of my training involved a tour through a large department store. This was really a coordination test for me with my electronic aid and Leland. It was like being set down in a veritable maze. I had to learn about the location and width of counters and aisles, as well as to tell the instructress on which side people were passing me. I climbed the stairs to the second floor, where she deliberately tried to make me lose my sense of direction. Finally, the time came to return to the street level, locate our original entryway and go through it quickly enough that Leland's tail would not be caught in the revolving door! To conclude that day's training, we sat in a subway station and my instructress had me count the number of people getting on and off the trains. Strenuous exercises, indeed! However, they really proved the value of the electronic aid and built up my confidence in moving about with it. All of this has also brought home to me how keen the sense of hearing is to be able to sort out sounds the way in which it does!

Of course, nothing can equal the God-given gift of sight that enables mankind to behold all the color and beauty with which the loving Creator has surrounded us. Nevertheless, I have been thrilled with the new avenues of "vision" that have opened up for me through my electronic aid. When I first heard about it, real excitement was aroused. The question came to my mind: Could it possibly help me to be a better proclaimer of God's wonderful Kingdom message for this time? That question has been fully answered by all the training I received in downtown and residential areas of Toronto. It is now much easier to perform my sacred service to Jehovah by going from house to house with the marvelous "good news of the kingdom." (Matt. 24:14) That has been my foremost reason for learning to "see with sound."—*Contributed.*

The Permanent Cure for Blindness

■ "Jesus said to them: 'Go your way and report to John what you are hearing and seeing: The blind are seeing again, and the lame are walking about, the lepers are being cleansed and the deaf are hearing, and the dead are being raised up, and the poor are having the good news declared to them; and happy is he that finds no cause for stumbling in me.' "—Matt. 11:4-6.

WHAT ABOUT THOSE AEROSOL SPRAYS?

By "Awake!" correspondent in Australia

HAVE you ever wondered how so much shaving foam comes out of those small aerosol cans? They seem almost bottomless! But did you know that actually there is no foam at all inside the container?

How is that possible? Well, we will see in a moment. But for now let us say that there is much more involved in a common "spray can" than meets the eye.

These convenient and useful aerosol devices are based on quite a sophisticated technology. A key to their success is the gas or "propellant" used to push the product out of the container. This is important because it must satisfy a number of special requirements all at the same time.

A Suitable Propellant

Mere compressed air or most gases just will not do the job properly. The ideal propellant must be nonpoisonous and nonflammable. It must not affect the quality, smell or taste of the product. Neither should it corrode the aerosol's mechanism. It has to be versatile enough to allow for the exact amount of wetness or dryness desired, also allowing for fineness of spray. It must be able to provide a wide range of pressures to suit the density of various products. And it must maintain the necessary pressure right to the last drop.

Obviously, there are few substances known that fulfill all these requirements. Gases called hydrocarbons, such as propane and butane, satisfy most of them, but they are also somewhat odorous and highly flammable. So, after much experimentation, fluorocarbon gases were found to meet the requirements best.

Under relatively low pressure, these gases become a liquid that mixes readily with many products without affecting their qualities. And a variety of fluorocarbon types can be used singly or in a mixture to provide the properties and pressures needed for individual applications.

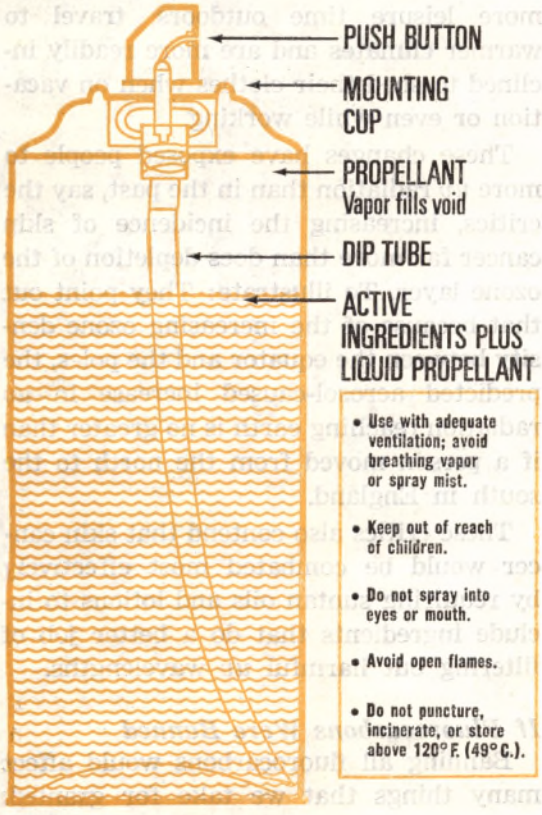
One illustration of fluorocarbon versatility is shaving foam. As noted earlier, there is no foam as such inside the can, but, rather, a pressurized mixture of liquid fluorocarbon propellant and the fluid product. As this liquid mixture reaches the nozzle and is suddenly relieved of pressure, the propellant instantly vaporizes, forming thousands of tiny bubbles within the product that you see as foam.

So, with the press of a button, you can now dry-clean your dog, spray on a bandage, make instant hors d'oeuvres or even attempt to ward off a shark attack. In

fact, more than 300 different types of products are now said to be packed as aerosols, and it is claimed that almost any product can be "aerosolized" if desired.

The versatility of fluorocarbons is such that over half of all aerosols came to use them as a propellant, while the remainder used primarily hydrocarbons and a few used other compressed gases. The fact that flammable hydrocarbons are the propellant in a high percentage of aerosols is often the reason for warnings on the containers: "USE ONLY WHERE THERE IS PROPER VENTILATION!" "DO NOT USE NEAR FLAME!"

It should be noted that these and other warnings such as "KEEP AWAY FROM HEAT!" "DO NOT STORE IN DIRECT SUNLIGHT!" "DO NOT PUNCTURE OR INCINERATE CAN!" may or may not have to do with the type of propellant. It is possible for any aerosol to explode if left near a fire or inside a car in hot sunlight. Aside from gas pressure, this could be due to the nature of the product or to other solutions that are mixed with it to give the desired texture.



While there is no uniform world aerosol safety legislation, most containers are tested at high heat and pressure, assuring relative safety. In fact, at normal room temperature, there may be less pressure inside an aerosol can than in many soft-drink containers!

Yet, with all their virtues, the popularity of fluorocarbon gases as propellants has been marred in recent years by a still-controversial scientific issue.

Aerosols and Ozone

A potential danger is said to exist each time you press an aerosol button. The culprit is not the device itself or the product in it, but the fluorocarbon propellants that make many aerosols work so well. The accumulation of these gases released over the past 30 years or so is said to be affecting the "ozone layer" high in the atmosphere.

Ozone is a highly active form of oxygen that is created in our atmosphere by the action of ultraviolet (*uv*) radiation on atmospheric oxygen. Ozone appears in appreciable amounts at altitudes roughly between 6 and 30 miles (10 and 50 kilometers) above the earth, with maximum concentrations between 12 and 15 miles (20 and 25 kilometers). This radiation-created layer itself acts as a shield against most of the sun's harmful *uv* radiation. Increases in such radiation are charged with causing more skin cancer.

The vast amounts of fluorocarbon gas released over the years are said to be rising slowly until they finally penetrate the ozone layer. Once above the protection of this layer, the sun's *uv* radiation can break down fluorocarbons, releasing chlorine

atoms and chlorine oxide. In turn, these elements destroy small amounts of ozone by converting it catalytically into plain oxygen. The amount of protective ozone is thus thought to be undergoing gradual depletion.

Other potential effects of this ozone depletion are also under study. The ozone layer converts *uv* radiation into heat, thus directly or indirectly influencing earth's temperature and weather patterns. Hence, it is thought that any variations in the ozone layer could affect many things on earth. Crop yields, plant growth, forests, oceans, fish and animal life are all potentially subject to any changes.

Further complicating research into this matter is the fact that ozone levels can vary as much as 25 percent just between day and night. These levels also seem to follow an 11-year cycle that may be affected by sunspot activity. And though most ozone is produced near the sun-drenched equator, the gas gradually moves toward the poles. So ozone density and thickness at the poles is somewhat greater than it is in the expanse between.

With so many interdependent factors involved, scientists say that it will take five to 10 years before their preliminary findings can be confirmed, rejected or adjusted with any degree of certainty. However, it is estimated by some that if fluorocarbons continue to be released at only the present rate, the ozone level could eventually be reduced by about 7 percent, though there is a large margin for error either way.

In the meantime, because the gas rises so slowly, scientists estimate that even if fluorocarbon use were completely stopped right now, the gas already in the atmosphere would continue to rise and affect the ozone layer for another 10 years! Even then, they estimate that it would take the ozone about 65 years more just to recover half of the maximum loss, and over a century to return to normal!

Some Counterarguments

Most researchers agree that fluorocarbons do have some adverse effect on the ozone layer, and that this, in turn, affects the incidence of skin cancer. But not everyone agrees that ozone depletion is the major skin-cancer hazard. Since World War I, the disease has increased far more rapidly than population growth, and some scientists believe that ozone depletion has played only a small role, if any, in this increase.

They point to the fact that skin cancer has even increased during times when the ozone level also increased. They say that growth of the disease is more likely a result of changing life-styles. People spend more leisure time outdoors, travel to warmer climates and are more readily inclined to shed their clothes when on vacation or even while working.

These changes have exposed people to more *uv* radiation than in the past, say the critics, increasing the incidence of skin cancer far more than does depletion of the ozone layer. To illustrate: They point out that because of the increasing ozone density between the equator and the poles, the predicted aerosol-caused increase in *uv* radiation reaching earth is no greater than if a person moved from the north to the south in England.

These critics also contend that skin cancer would be combated most effectively by requiring suntan oils and lotions to include ingredients that do a better job of filtering out harmful *uv* wavelengths.

If Fluorocarbons Were Banned

Banning all fluorocarbons would affect many things that we take for granted.

These gases are the refrigerant used for almost all cooling purposes throughout the world. Other gases would not work well in present systems.

Fluorocarbons are also the blowing agent used in manufacturing many familiar foam plastic products such as lightweight packaging, carpet backing, flooring, man-made leather and upholstery, flotation material, drinking cups, ice chests, thermal insulation and many other things. No satisfactory substitute has yet been found. Either the fire risk with other gases is too high and/or the product is inferior.

Elimination of fluorocarbons would affect the food, trucking, textile, electronic, automotive, optical, paint, printing, photography and steel industries, to name a few. Even hospitals and pharmaceutical suppliers would feel the loss.

However, aerosol use of fluorocarbons accounts for about three quarters of the total, and only a quarter is divided mainly between refrigeration and plastics. So the emphasis now is primarily on reducing nonessential use of aerosols. Many experts strongly recommend selective regulation of fluorocarbons rather than an outright ban. The state of Oregon has been selective by banning fluorocarbon aerosols as of March 1, 1977.

Are There Alternatives?

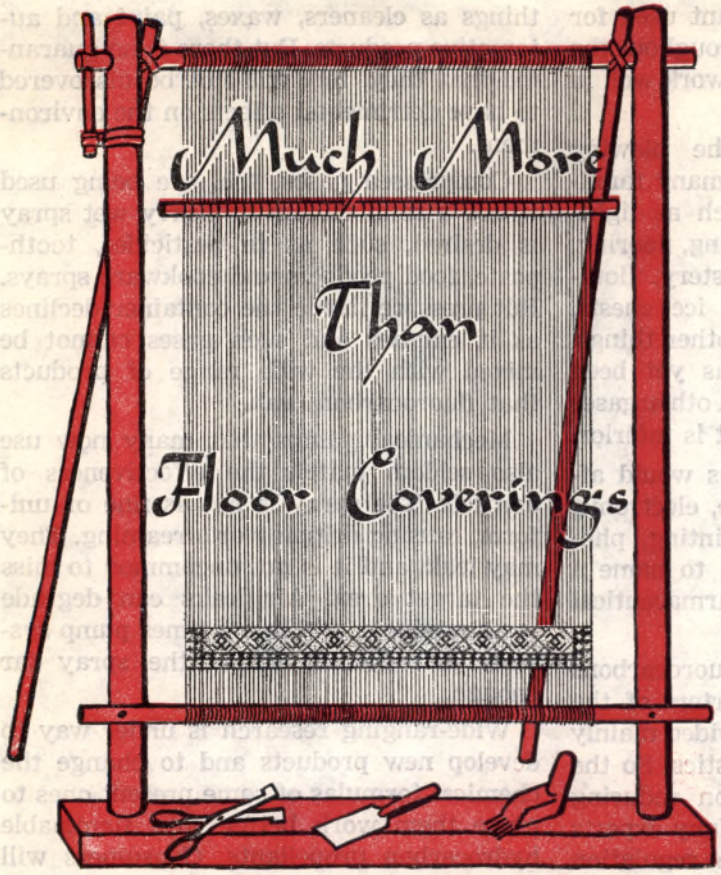
As noted before, hydrocarbons have some features required of the ideal propellant, but they are highly flammable and odorous. Some are also toxic to humans and do not always allow for a uniform spray to the last drop. They are already used extensively, where possible, for such things as cleaners, waxes, paint and automotive products. But there is no guarantee that they, too, will not be discovered to have detrimental effects on the environment.

Compressed gases, too, are being used where a solid stream or heavy wet spray is desired, such as in pesticides, toothpaste, food products and cookware sprays. But pressure inside the container declines as it empties and such gases cannot be mixed with the wide range of products that fluorocarbons can.

Mechanical pumps that many now use also seldom match the effectiveness of aerosols. The spray is not as fine or uniform, causing dripping or streaming. They may leak, and it is not uncommon to miss the target area. Air leaks can degrade some products, and many times pump systems just do not throw the spray far enough.

Wide-ranging research is under way to develop new products and to change the chemical formulas of some present ones to make them work better with flammable hydrocarbon propellants. Consumers will have to decide whether this changeover harms the quality of future products. But no doubt such items will be more expensive than those used now.

Practically every aerosol product is available in some more or less effective substitute form today. With some items you may decide to forgo the advantages of aerosol application, while with others your decision may be to continue using this convenient addition to our modern way of life. However, for the moment, in most places the choice is yours.



By "Awake!" correspondent in Turkey

SOME view them as dusty necessities around the home. Keeping them clean is hard work. When they wear out, replacements can be costly.

Others consider them highly prized possessions. Many are on display in famous museums throughout the world. In the confined and shuttered houses of Persia and Anatolia, they may be the only furnishings.

What are we talking about? Handwoven Oriental rugs, or carpets. These works of art are more than just floor coverings. For centuries they have represented the art and wealth of Oriental peoples.

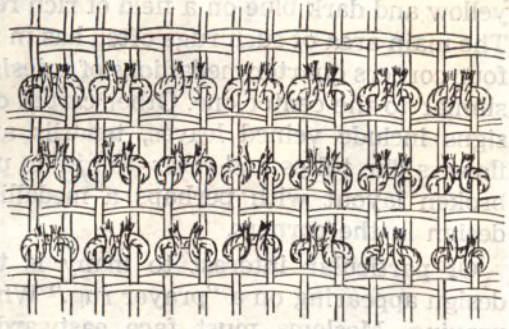
The origin of carpet weaving seems to be lost in the mists of antiquity. Assyrian stone carvings from the eighth century before the Common Era depict carpets with four-leafed motifs and other designs. Excavation in southern Siberia of royal graves from the fifth to the third century B.C.E. has turned up the oldest known example of a handwoven and knotted carpet.

The Weaving Process

How are Oriental rugs produced? Carpet weaving is done on a rectangular loom. Strands of yarn stretched from one end of the loom to the other are called "warp" threads. Drawn across these are "weft" threads, which go alternately over and under the warp threads.

But there is another important element in Oriental rugs, one that is responsible for their variety of colors and designs. To produce these the weaver takes short pieces of colored wool and fastens them with a special knot around pairs of warp threads. This process may be performed by one individual, or by two or more working side by side.

In the East two kinds of knot have come into use: the Gördes, or Ghiordes (geeOR'des), and the Sine, or Sehna (SEN'na). When using the Gördes knot, the weaver takes a short length of colored wool, loops its left end around the left side of a pair of warp threads, and its right



Gördes or Turkish knot

Sine or Persian knot

end around the right one. The two ends are then drawn up between the two warp threads. The Sine knot goes under one warp thread and has a single loop around the next one. This knot results in an end sticking up between each warp thread.

According to the book *Oriental Rugs in Colour,* an average female weaver can tie 800 to 1,000 knots an hour, a knot every three to four seconds. "A good craftswoman," notes the same publication, "can tie 6,000 to 10,000 knots a day, according to the density of the knots and the nature of the material. A workshop hand [regularly employed in making Oriental rugs] commonly turns out rather more, up to 14,000 knots a day."

When an entire row of these specially knotted threads is completed from side to side, two or three weft threads are

Handwoven Turkish carpet

drawn across and pressed down upon the knots with a kind of large comb. This tightens and compresses the knotted pieces, leaving their ends projecting upward. Later the projecting woolen tufts are clipped to the same length, giving an even surface.

Intricate Designs

Oriental rugs feature many intricate designs. In 1905 carpets from the period of Seljuk domination of Turkey (eleventh century of the Common Era) were found in the Alaedin mosque at Konya, Central Anatolia. They have background colors of dark blue or red. In lighter shades of the same colors are designs in the form of oft repeated geometric patterns. These include octagons with hooked corners, eight-pointed stars, and even more complicated designs.

Some carpets have the field, or main area, divided into small squares or hexagons, in which there are bird or animal figures. There are specimens of Oriental rugs containing action scenes of animals attacking one another. Some of the rugs are quite large. One measures 15 square meters (161 square feet), with each square meter having about 84,000 Gördes knots. Especially interesting are the borders of these carpets, often adorned with bold Kufic lettering, a simplified form of the Arabic alphabet.

Later came "Ottoman" carpets, coinciding with Ottoman rule throughout the Central Anatolian plains of Turkey. Some are called "Holbein" rugs because they appear in the paintings of the sixteenth-century German painter Hans Holbein. These rugs have a very high knot count, with as many as 100,000 to 150,000 knots per square meter (1.2 square yards).

Other examples of this Oriental art are the Uşak carpets. The *Encyclopædia Britannica* (1976 Macropædia) describes them as having central star medallions in gold, yellow and dark blue on a field of rich red. The main area of such rugs often has in its four corners quarter medallions of a design similar to the center one. Other carpet designs include veined leaves, tendrils and flowers like tulips and roses—all in an unbroken layout with perhaps a medallion design in the corners.

Of particular interest to many is the design appearing on a "prayer rug." When praying, Moslems must face eastward—toward their holy city, Mecca. The design of prayer rugs, therefore, includes something like an arrowhead. When the rug is laid down, this arrow must point toward Mecca.

Caring for an Oriental Rug

How should a person care for one of these specially designed carpets? The best method is plain, old-fashioned beating. It should be done lightly from the back, knocking dust and grit away from the knots. To accomplish this, one should have a properly made rug beater. Gentle beating also tightens the knots and restores the surface. If a carpet is cumbersome and difficult to handle, second to beating comes a thorough vacuum cleaning.

Besides these methods, one may keep an Oriental rug clean by washing it with mild, pure soap. Drying should take place in a light, airy location, but not in direct, hot sunlight. And be sure to spread the carpet out flat when drying it. Otherwise it may dry in an odd shape and develop creases. Some recommend laying a carpet face down in snow and then gently beating it. Supposedly, this benefits the colors and fibers.

Oriental carpets represent a long tradition of fine craftsmanship. Those who know something about their history and makeup well realize that they are much more than floor coverings.

The Bible's View

Can Blasphemy Be Forgiven?

JESUS CHRIST on one occasion told certain Pharisees: "Every sort of sin and blasphemy [abusive speech; slander; impious word] will be forgiven men, but the blasphemy against the spirit will not be forgiven. For example, whoever speaks a word against the Son of man, it will be forgiven him; but whoever speaks against the holy spirit, it will not be forgiven him." (Matt. 12:31, 32; *An American Translation; The New English Bible; Weymouth*) This gives rise to such questions as: Why may blasphemy against the Son of God and his Father be forgiven? How might a person blaspheme them and yet not also be reviling God's spirit? What does it mean to blaspheme the holy spirit?

The Bible provides a specific example of one who blasphemed God and Christ but did not become guilty of unforgivable sin. This one was Saul, or the apostle Paul, prior to his conversion. Paul wrote to Timothy: "Formerly I was a blasphemer [abusive speaker] and a persecutor and an insolent man." —1 Tim. 1:13; compare *An American Translation; The New English Bible.*

Before his conversion, Paul regarded disciples of Jesus Christ as apostates deserving of death. He felt that the Mosaic law approved of his course, for that law stated regarding an apostate: "You must not accede to his wish or listen to him, nor should your eye feel sorry for him, nor must you feel compassion, nor cover him protectively; but you should kill him without fail." (Deut. 13:8, 9) Convinced that he was right, Paul continued to act against Christ's disciples in a high-handed, arrogant manner and so revealed himself to be an "insolent man." As a persecutor of Christians, he was one like those of whom Jesus said to his disciples: "Everyone that kills you will imagine he has rendered a sacred service to God." (John 16:2) Paul was guilty of blaspheming or speaking abusively of the Son of God. His hatred for Christ's disciples demonstrated that he viewed Jesus as an impostor and thus he reproached the Christ. By speaking abusively of the Son, Paul was also guilty of blaspheming the Father whom Jesus represented. —John 7:29; Matt. 27:39; Mark 15:29; Luke 23:39; Jude 8, *The Kingdom Interlinear Translation of the Greek Scriptures.*

After his conversion, the apostle Paul came to appreciate how perilously close he had come to committing the unforgivable sin. In his letter to Timothy, he acknowledged the great mercy that had been shown him and also indicated why he could be forgiven. We read: "I was shown mercy, because I was ignorant and acted with a lack of faith." (1 Tim. 1:13) Note that Paul, before his conversion, did not knowingly fight against God and Christ. He was ignorant, blind to the truth about the Son of God, and so without faith in Jesus Christ. Therefore, the appeal of the dying Stephen, whose murder Paul approved, was also in Paul's behalf: "Jehovah, do not charge this sin against them." (Acts 7:60) At heart, Paul really wanted to do what was right, as is evident from his zeal for Jewish tradition and his strict adherence to the teaching of the Pharisees.—Phil. 3:5, 6.

Hence, when Jesus Christ himself imparted understanding to him, the persecutor Saul did not hesitate to change his course. Soon he found himself among the hated, persecuted, abusively spoken-of disciples of the Son of God.—Acts 9:3-25; 18:5, 6.

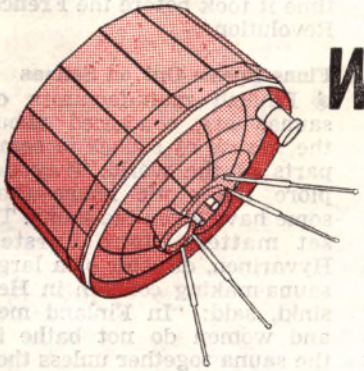
The case of Paul can serve as an encouragement to all who, in ignorance, may have proved themselves to be fighters against God and Christ. Their blasphemy or abusive speech can be forgiven them if they repent. The apostle Paul himself made a strong point of this, saying: "Faithful and deserving of full acceptance is the saying that Christ Jesus came into the world to save sinners. Of these I am foremost. Nevertheless, the reason why I was shown mercy was that by means of me as the foremost case Christ Jesus might demonstrate all his long-suffering for a sample of those who are going to rest their faith on him for everlasting life."—1 Tim. 1: 15, 16.

How, then, is it that one can be guilty of the unforgivable sin? Persons who with full knowledge deliberately oppose God and Christ, hide the truth and propagate falsehoods make themselves guilty of sinning against God's spirit—a sin that cannot be forgiven. This is what certain Pharisees did in the days of Jesus' earthly ministry. They were eyewitnesses of the miracles and powerful works of God's spirit operating through Jesus Christ. But they refused to glorify Jehovah God. For selfish reasons, they attributed to Satan the work of God through Christ. In this way they sinned against God's spirit.—Matt. 12: 24-32.

Other incidents reported in the Bible also illustrate that certain religious leaders deliberately placed themselves in opposition to the operation of the holy spirit. After Jesus resurrected Lazarus from the dead, they were determined to have Jesus put to death. (John 11:47-53) But that was not all. The Scriptures tell us: "The chief priests now took counsel to kill Lazarus also, because on account of him many of the Jews were going there and putting faith in Jesus."—John 12:10, 11.

Later, when soldier guards stationed at the tomb brought back a report that Jesus had been raised from the dead, the chief priests were determined to hide the facts. What did they do? The Bible answers: "After these had gathered together with the older men and taken counsel, they gave a sufficient number of silver pieces to the soldiers and said: 'Say, "His disciples came in the night and stole him while we were sleeping." And if this gets to the governor's ears, we will persuade him and will set you free from worry.' "—Matt. 28:11-14.

So, the Scriptures make it clear that sin against the spirit involves acting knowingly and deliberately against the undeniable evidence of the holy spirit's operation, as did the chief priests and certain Pharisees in the days of Jesus' earthly ministry. However, anyone who may in ignorance blaspheme or speak abusively of God and Christ can be forgiven, provided that he is genuinely repentant. Nonetheless, since it is possible for a person to blaspheme against God's spirit, this emphasizes the importance of keeping as far away from sinful speech as possible. (Jas. 3:2-10) We should strive to imitate the example of the apostle Paul after his conversion. He said: "I pummel my body and lead it as a slave, that, after I have preached to others, I myself should not become disapproved somehow."—1 Cor. 9:27.



Watching the World

Artificial "Blood"

◈ Swedish research points to success in making synthetic "blood" to replace natural blood in cases of emergency. Compounds containing granules made of carbon and fluorine are said to be especially promising because they "absorb and transport oxygen and carbon dioxide much like human blood," according to *The Journal of the American Medical Association*. So far, this particular "blood substitute" research has progressed from rats to baboons. There have been similar experiments elsewhere.

Tobacco Smoke Tar

◈ Recently, studies at Heidelberg, Federal Republic of Germany, have confirmed that the respiratory system's tiny hairs are clogged by tobacco smoke tar. Since these hairs clear foreign and harmful bodies from air passages, the clogging of them is highly detrimental. Under such circumstances, lung cancer could "possibly be attributed to the fact that [cancer-producing] substances in smoke have free access to the lung vesicles," say the researchers, according to the Belgian journal *To the Point International*.

Polygamists Not Excluded

◈ Recently, the National Synod of the Church of Christ in Zaïre decided to grant membership to polygamists. However, according to *The Christian Century*, this federation (which does not include the country's Kimbanguist and Roman Catholic churches) resolved that polygamists may not be given ecclesiastical duties.

Where It Is Cheaper

◈ In a list of 57 cities, Business International placed Tokyo first in 1977 as having the highest cost of living. Next in line were Stockholm, Oslo, Zurich, Vienna, Geneva, Copenhagen, Helsinki, Brussels, Frankfurt and Paris, with New York city in 17th place. But in which of the major cities is it cheaper to live? Citing "relatively cheap cities," *Parade* magazine lists Rome, Dublin, Lisbon, Beirut, Rio de Janeiro, Manila, Bangkok, Madrid, Johannesburg, Bogotá, Mexico City and Cairo. The least expensive city is Buenos Aires, Argentina.

Rotating Radial Tires

◈ Howard D. McDonald of the Goodyear Tire & Rubber Company says that radial tires (unlike their bias or bias-belted counterparts) develop a life-long "set." So, if you rotate radials by moving them from one side of your car to the other, vibration or a rough ride may result. McDonald recommends front-to-back rotation every 6,000 to 8,000 miles (9,600 to 12,800 kilometers), while keeping the radials on the same side of the vehicle. And what about the spare tire? If included in the rotation, place it on the right side, where tires suffer the most abuse from curbs and the like. Of course, the opposite would apply in countries where vehicles are driven on the other side of the road.

Addicted to Work?

◈ Gerhard Mentzel, a German neurologist, contends that work addiction is as serious as alcoholism. Early symptoms are said to include such things as stomach aches and headaches, circulatory problems, loss of concentration, and unreasonable fears. Among other things, Mentzel says that confirmed workaholics remain awake nights thinking about their work, and they have a compulsive urge to stay on the job for some time after normal office hours.

Dinnerware Danger

◈ According to the U.S. Food and Drug Administration (FDA), there is no health peril associated with normal use of ceramic dinnerware having heavy metals in its glazes and decals. "But," states the *FDA Drug Bulletin*, "leaching of heavy metals (cadmium, lead) may occur when acidic foods (carbonated beverages such as cola drinks; cider; foods containing vinegar; fruit juice, cooked fruits, and other fruit products; sauerkraut; tomatoes; wines, etc) are stored in dinnerware." So, under conditions of normal use, one may not need to worry about the danger of toxicity in the case of such decorated earthenware or fine and bone china. "However," cautions the *Bulletin*, "homemade articles and other suspect items should be tested before they are used."

Keen Hearing

◈ Many animals have a keener sense of hearing than do humans. For example, the high frequency of an ultrasonic whistle can be heard by dogs, but not by people. Cornell University scientists say that birds may be able to hear sounds at far greater distances than we once thought, perhaps hundreds of miles. Experiments have shown that homing pigeons can hear infrasound. These are sound waves that have a frequency too low for humans to hear, but which may travel thousands of miles through the atmosphere. It was thought that these sounds perhaps aid birds to migrate, helping them to identify surface features such as ocean breakers crashing over shorelines, or winds whistling through mountain peaks.

Philip of Macedon's Tomb?

◈ Recently, at the village of Vergina, near Salonika, Greece, a tomb was uncovered that some consider to be that of Macedonian King Philip II, father of Alexander the Great. However, certain archaeologists doubt this identification. According to the discoverer, Prof. Manolis Andronikos, five ivory heads found in the tomb furnished deciding evidence. Prof. Andronikos believes that the small heads represent Philip, his father and mother, Olympias (his first wife) and their son Alexander. Among other finds at the site were two gold ossuaries, or boxes, bearing the bursting star symbol of the Macedonian royal family, as well as a golden diadem worn by kings of Macedon.

Family Disputes

◈ In a recent survey, the magazine *Schoener Wohnen* (*Better Living*) found that in the Federal Republic of Germany the majority of family disputes relate to just how loud the stereo or television set is to be played. Thirty-two percent of the families polled cited arguments about which television program is to be watched.

For Your Fireplace

◈ According to the Maine Bureau of Forestry, the types of wood having the best fireplace heating qualities are beech, black locust, hickory, red oak and sugar maple. All but sugar maple are hard to start burning, however. For ease of kindling, as well as desirable fragrance, one might select white pine or cedar, but cedar has the disadvantage of giving off numerous sparks. Cherry and apple are noted for fine fragrances and few sparks, although they are hard to kindle.

Suez Canal Traffic

◈ Two years after its reopening, the Suez Canal's traffic has risen to a daily average of 55 ships, nearly the number using it prior to the 1967 Middle East war, when the waterway was closed. But Suez Canal Authority chairman Mashour Ahmed Mashour reportedly adds that the shipping volume has almost doubled, inasmuch as present vessels are bigger and can transport more goods. Not as many oil tankers now use the canal, however, as it can accommodate laden ships weighing only 60,000 tons and having a draft of 38 feet (11.5 meters). Hence, about half the world's oil tankers are too large to pass through the canal. Presently, though, a deepening and widening project is in progress that would, by 1980, enable the waterway to take loaded vessels of 150,000 tons and having a 53-foot (16-meter) draft.

Faster in 1789?

◈ Britain's House of Lords recently heard a complaint about the mail service from London to Paris. Lord Boyd-Carpenter claimed that a letter now takes 12 or 13 days to deliver. He added: "This is twice the time it took before the French Revolution."

Finns Speak Out on Saunas

◈ Finnish manufacturers of saunas are concerned about the misuse of saunas in some parts of the world. They deplore the erotic image that some have given the sauna. To set matters right, Torsten Hyvarinen, director of a large sauna-making concern in Helsinki, said: "In Finland men and women do not bathe in the sauna together unless they are members of the same family, and in many families older boys and girls bathe separately." Though Finland has fewer than five million people, it has almost a million saunas.

"Lasering" Glaucoma

◈ Soviet medical scientist Michael M. Krasnov, head of Moscow's State Institute for Eye Diseases, claims almost 100 percent success for his laser treatment of one type of glaucoma (closed-angle), and about 65 percent success with the other major type (open-angle). He uses a very high-energy ruby laser of extremely short duration to make the eye puncture that reduces internal fluid pressure. Otherwise, surgery may be required. "On average, patients need repeated treatments at intervals of about six months," reports *Medical World News*. But most patients "prefer a five-minute treatment a couple of times a year to surgery." American scientists still rate the procedure as experimental.

"One Pig per Mu"

◈ To grow crops for her more than 800 million people, "China's agriculture uses mainly organic or farm manure," according to *China Reconstructs*. "Pig manure is the biggest source of farm manure in China," says the journal. The three tons of manure produced by a pig each year can produce "five to ten tons of

high quality fertilizer," when mixed with weeds and earth. Together with small amounts of chemical fertilizer, this is "enough for one *mu* (0.06 hectare [.15 acre]) of land." The magazine notes that "the target of 'one pig per person' or 'one pig per *mu*' is common."

Resourceful Greek

◈ A young Greek student who got nearly perfect answers in the entrance exams for the Athens Polytechnic School had a lot of help. "Young Andreas had tied on his two feet a transmitter and a receiver," reports the *Athens Daily Post*, "and was in continuous contact with his two friends in [a] car" parked outside. After hearing the problems broadcast, his friends would look in textbooks for the answers and dictate them to him. The suspicious professor noted that the student failed to write anything during the first half of the exams, yet wrote during the second half while holding his left ear.

More Grain—More Hungry

◈ Grain stocks throughout the world generally have improved due to good harvests in a number of countries. However, *To the Point International* observes: "Starvation still worsens. Full grain stores are doing little to alleviate the malnutrition of the estimated 450 million people who live beyond the reach of food handouts." The explanation for "the gloom in the midst of plenty" is the lack of any world system for distributing the grain evenly. So those who have the money get the grain.

British Enterprise

◈ The director of a small English company learned that Mecca's usual supply of Moslem prayer mats from Beirut was cut off by Lebanon's civil war. "I copied an illustration from a book at the local library," he says. "A couple of days later half a dozen samples were on their way to Mecca. The orders rolled in and soon the firm had sold 74,000 of them." His company received this year's "Incredible Exporter of the Year Award."

Flying Chickens

◈ Chickens are seldom considered to be birds of flight. Yet what flight there is in them has been developed by some enterprising chicken owners. At a chicken-flying meet on the island of Rota, northern Marianas, one bird set a new world distance record of 339.15 feet (103.37 meters). This broke the previous record of 293.9 feet (89.58 meters) set in Ohio, U.S.A.