How to Prepare for Y2K and Other Crises

BY VANCE FERRELL

THE MOST COMPLETE COVERAGE IN THE SMALLEST AMOUNT OF SPACE

SIMPLE YET EXTREMELY PRACTICAL

PLUS A SECOND SECTION ON THE INHERENT DANGERS IN Y2K

CRISES ARE COMING AND Y2K WILL NOT BE THE BIGGEST

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by Vance Ferrell
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"A prudent man foreseeth the evil, and hideth himself; but the simple pass on, and are punished."

—Proverbs 22:3

"Come, My people, enter thou into thy chambers, and shut thy doors about thee. Hide thyself as it were for a little moment, until the indignation be overpast."

—Isaiah 26:20

"By faith Noah, being warned of God of things not seen as yet, moved with fear, prepared an ark to the saving of His house."

—Hebrews 11:7

"Let them which be in Judea flee into the mountains."

—Matthew 24:16

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Introduction

THE BACKGROUND OF THE PROBLEM

The *Wall Street Journal* calls it the most expensive industrial accident of all time. Others had said it was only a bump on the road of progress, while others maintain it is the end civilization for a decade. Whatever it is, it is going to affect you.

Y2K (the millennium bug, or Year 2000 technology problem) was created in the early days of computers, when memory was scarce and expensive. Programmers took shortcuts whenever possible to save space. Instead of using a four-digit code for year dates, a two-digit entry was used. This practice continued, long after the need of saving space was eliminated. It had become a habit for programmers to use the two-digit method.

The two-digit code was also used in embedded chips, which exist in many devices which control processes. In order to illustrate the broad range of problems which could develop when the century changes, here are some of the devices which use embedded chips:

Aerospace, aviation, alarm systems (process, security, fire, and home), automatic teller machines (ATMs), automobile power train control modules, automobile engine management computers, bank vaults, business machines (postage, fax, etc.), consumer electronics, control systems (manufacturing, cryogenics, electric power), computer motherboards (BIOS chips, RTCas on IBM PCs), clocks (including real time clocks), communications infrastructure (financial data, etc.), elevators, energy infrastructure (oil, gas and electric utilities), global positioning and navigation systems (in satellites, airplanes, and on the ground), food distribution, heating and ventilation systems, air conditioning controls, household appliances, lighting controls, printing presses, process controllers, pumps (including gas station pumps and those in buildings), manufacturing equipment, medical equipment (including pacemakers and implanted pumps), refrigeration controls, scientific appa-

ratus, seawater desalinization, shipping (radar, safety, ballast, and performance monitoring), supervisory control and data acquisition (SCADA) systems, telecommunications (private branch exchanges, custom premises equipment), water treatment facilities, weapons, valves (including plumbing and HVAC).

Shell Oil estimates that a typical offshore oil rig uses approximately 10,000 embedded chips, of which approximately 12% are not Year-200-compliant. Some chips are buried below ground where they are inaccessible.

Perhaps that affords you a hint of the extent of the Y2K problem.

The magnitude of the risk exposure increases when one considers that there are complicated interactions among systems. A breakdown in one can ricochet to many others. For example, it is believed that food shipments may stop because trucks are dispatched by computers.

To add to the problem, each chip maker is trying to solve the Y2K problem his own way, and the system may fail because the fixes may not be compatible with one another. Failures in one system can induce failures in other systems via computer networks. Software non-compliance can cause both compliant and non-compliant embedded systems to fail.

Estimates place the assessment, repair, and testing phases of a Y2K conversion effort for a medium-sized non-nuclear plant at 21 months. It will take 30 to 40 million dollars to locate, repair, and test the 500 or more non-compliant systems out of the tens of thousands in a typical plant.

According to Mark Frautschi, Ph.D., a systems analyst, the only certainty is that systems observed to be functioning normally after January 1, 2000—are not guaranteed to be Year-200-compliant! They may fail years in the future, depending on when their internal clocks were set (their epoch dates). He adds that every power grid has a "hot spare," which goes into action when the system breaks down. But embedded chip disfunction will take that down too—and there will be, what the electrical industry calls, a "system black." There will simply be no electricity; and, with all those faulty chips embedded, how soon will the problem be fixed?

Another expert says the most practical solution for businesses (and families) in America—is to begin the practice of going a week without electricity, running water, etc., and learning to improvise without them! Such advice only points out the seriousness of the

looming 2000 crisis.

DATES TO BEWARE OF

Many experts predict that the Y2K problem is more likely to be a persistent one, over a few years, rather than a single crash at the beginning of the century. January 1, 2000, is not the only date in the near future that may disrupt data-processing systems. All computer programs with fiscal years that start earlier than December 31, 1999, are suspect. Here are other dates that could cause disruptions are the following:

January 1, 1999—This is the one-year look-ahead date into the next century. Many computer programs process data by looking forward one year and counting dates back from that point. If such systems have two-digit date problems that are not corrected in time, they may begin to malfunction or fail at the start of, or during, 1999.

April 7, 1999—This is the 99th day of the 99th year.

August 22, 1999—This is the "GPS Rollover" date. The Global Positioning System is a constellation of 24 low-orbiting satellites that continually signal data that can be used to determine the exact location of any receiver on the surface of the earth. The data are also used by some systems to establish the exact time of day for transaction logging. The clocks on this system report as the number of weeks since the launch of the system in 1980. On August 22, 1999, this counter will overflow and return to 0000 (as would happen on the odometer of a car that traveled 1 million miles). At that point some systems, of equipment, that use the GPS signals will malfunction. Among the vulnerable devices are some cellular telephones, devices that track the location of freight shipments, and some navigational equipment. However, many manufacturers of such devices have built their products to handle the rollover period correctly.

September 9, 1999 (abbreviated as 9/9/99)—A common programming device was to enter 9999 as a signal that a stack of data had reached its end. This signal may sometimes have programmed on date fields, with the result that the date 9/9/99 will have a special and unintended meaning in a program. Although the incidence of 1/1/2000 problems appears to be much greater than that of 9/9/99 problems, systems should be checked for each.

February 29, 2000, the Uncommon Leap Year—The year 2000 is divisible by four and is a leap year. However, years divisible by 100 are not leap years (1900 was not) unless they are divisible by 400 (2400 will by another leap year). Some programmers did not know about the hundred-year rule when they wrote their original codes, and those programs will run fine in 2000. Some programmers knew about the hundred-year rule, but not about the four-hundred-year rule, and their programs are likely to fail.

October 10, 2000—This is the 10-10-00.

December 31, 2000—This isthe 366th day of an uncommon leap year. Some programs operate by counting the days in the year. If the writers of these programs were unaware of the uncommon-leap-year situation, their systems may not fail until December 31, 2000, the (unexpected) 366th day of the year.

AREAS OF SPECIAL CONCERN

The President's Council on Y2K Conversion, established by the White House, as well as a Special Senate Committee investigating the subject, have focused their attention on defining the scope of the Y2K problem. Hearings have been conducted by the U.S. Senate Special Committee on the year 2000 Technology problem. They have concluded that the following eight areas appear likely to cause the most problems:

Utilities and the national power grid
International banking and finance
Health care
Transportation
Telecommunications
Pension and mutual funds
Emergency planning
General business
Government agencies (such as IRS, defense, etc.)

Experts who spoke at the Senate hearings believe that, at the least, there may be localized disruptions. For example, in some areas, electrical power may be unavailable for some time. Manufacturing and production industries may be disrupted. Roads may be closed or gridlocked if traffic signals are disrupted. Electronic credit card transactions may not be processed. Telephone systems may not work.

What should you do in order to be prepared for the end of the millennium and Y2K? In this booklet, we have attempted to provide you with that information. You will here find more information on how to get ready than in any other book of comparable size.

Most of the items mentioned in this book—including stocking up on foodstuffs and equipment and withdrawing money from various accounts, are best completed before October 1999.

FOUR FACTS STAND OUT

First, a crisis is going to occur at the turn of the century. The only question is how long it will last: a few days, a few weeks, or several months.

Second, It is not wrong to prepare, and you should prepare.

Third, unlike nearly every coming crisis, this one primarily (but not fully) focuses on one date: January 1, 1999. We know when the main crisis will begin.

Third, There really is no problem if we are wrong in our estimate, and no crisis occurs. So what if we store up extra water, food and a few other things; we will just use it up later on. No money is lost. So what if we buy an electrical generator. It will surely help us later; Y2K will not be the last crisis in the future!

Fourth, it is wiser to plan for a three-month crisis, than for a three-day crisis.

> "Our confidential sources in the defense industry tell us that one company involved in doing deeply classified government work has a two-day training course for all of its employees, instructing them that they should prepare for a national power blackout—not a brownout—of up to 90 days due to Y2K. They are not predicting that great of an outage, but they are preparing for it!"—*Chuck Missler, K-Ration Intellgience Report, June 23, 1998.*

Cities Preparing

"PORTLAND DRAFTS PLANS FOR DEALING WITH Y2K: The Ambitious Effort Includes Organizing Neighborhoods to Prepare for Disruptions Caused by Computer Problems—Friday, February 19, 1999, By Steve Woodward of the Oregonian staff.

"This is not—repeat, not—a Y2K drill.

"City officials are drafting ambitious plans to organize Portland's 200,000 households into small, self-sufficient units, marshaled by potentially thousands of neighborhood leaders trained to head off problems resulting from the Year 2000 computer problem.

"If approved and executed beginning this spring, the effort would be one of the antion's largest municipal Y2K preparedness efforts.

" 'We're taking this seriously,' Mayor Vera Katz said Thursday. 'The purpos is not to raise a tremendous amount of concern, but to be prepared for an emergency. It doesn't mean it's going to happen.'

"Portland's approach, though mammoth in scale, will try to walk a middle ground betwen doomsayers who preidct social collapse and naysayers who predict a colossal yawn on January 1, 2000.

" 'It's a wonderful opportunityh for us to prepare citizens for any kind of natural disaster,' said Katz, who rallied citizens to action during the 1996 floods.

"The city will approve as much as $150,000 to finance the outrach campaign, including a full-time public information officer, a telephone-and-internet referral network, a city Y2K web site, outreach materials and assistance from the Global action Plan for the Earth, an international environmental organziation that created the community-organized model.

"With little more than 10 months left until the end of the 1900s, Portland citizens have been calling City Hall with fears about the

local power supply, food and water availability, emergency services and other basic necessities.

"Many callers worry that 'significant social breakdown is a distinct possibility,' accoriding to a draft prepareedness document that has been circulating among city officials this month. Katz hears from residents who are unnerved by 'rumors, misinformation and speculation.'

" 'They're very surprised about how many of their friends ar thinking in survivalist mode,' she said.

"The source of fear is the Year 2000 computer problem. Computers that use two-digit dates, such as 99, may malfunction when the year rolls over to 00. They may read the new year as 1900 rather than 2000, resulting in consequences that Y2K pundits argue coudl range from misdated reports to compleet shutdowns of systgems that control modern civilizations' vital functions.

"The predominant view of city officials is that the risk of longlasting, widespread Y2K-related failures is small, but tht the dangers of bad preparation could be big.

"If everyione hoards cash and gasoline, for example, the risk fo indjury from burglary or fire is 'probably significantly greater' than breakdowns fo bank ATMs or electrical failures, acording to the draft preparedness document.

"City officials sought out Global Action Plan after found David Gershon recently unveiled his community-organizing model in testimony before a congressional Y2K committee. Glboal Action, based in Woodstock, NY, has been under city contract in Portland for the past three years to develop 'Eco Teams,' small groups of households that work together to pool resources and reduce waste.

"The Y2K model calls for expansion of the Eco Team concept into groups of roghly 150 households, or about 10 city blocks, each coordinated by a volunteer block leader. The approach can also be adapted for individuals or for groups other than neighbors. Each group will recieve a workbook and literature explaining the Year 2000 computer problem, potential consequences and appropriate ways to prepare for contingencies. Because nobody knows how long any Y2K-related disruptions may last, residents will be coached on how to prepare for failures of basic services that last for 72 hours, two weeks and two months.

" "What we have in Portland is a city that is taking their charge seriously for taking care of their citizens,' said Gershon. Portland

is setting a national precident for how cities can prepare themselves.'

"Other large U.S. municipalities lauded widely for their Y2K preparatoins include San Diego; Montgomery County, MD; and Boulder County, Colo.

"The city's preparedness strategy would tackle the problem formtwo key directions:

"First, the city wants to become a one-stopsource of infmration on every phase of Y2K issue that could have a major impact on residents. That would include not only the status of teh city's own $3 million Y2K rfepair effort, but also the status of other local services, such as utilities, public safety, health care and transportation.

"Second, the city wants to create a network of knowledgeable citizens who will lead others in preparing their own households and neighborhoods for potential disruptions in goods and services.

"To organize nearly half a million residents, the city would enlist the aid of existing organizations, from the citys 93 neighborhood associations to Boy Scout troops to schools, churches and soc9ial clubs. Oversight of the proces woudl fall tothe city's Office of Neighborhood involvement, which already oversees the neightborhood associations and community programs ranging from crime prevention to refugees to neighborhood mediation.

" 'My focus is on what's good, solid community preparedness,' said Celia Heron, interim director of the Office of Neighborhood Involvement. 'The solution to the Y2K problem and many others is neightborhood involvement.' "—*Portland (Oregon) Oregonian, February 19, 1999.*

— PART 1 —

Preparing for Y2K and similar emergencies

BASIC PREPARATION

Two of the most valuable preparations you can make for the coming crisis are these:

1 - Surrender your life to God, and let Him guide your life. By faith in Christ, as your personal Saviour and through His enabling grace, obey the Ten Commandments and the words of Scripture. Trust Him to care for you and cooperate with Him. Do your part to prepare for what is inevitably coming.

2 - Live in the country. This is a great solver of life's problems. Many of the situations discussed in this book will be minimized if you live in a rural area, have a well and a garden plot, and some trees. Such a setting will also provide you with room around your home for emergency activity and storage.

—Get out of the cities! They will become very dangerous places in which to live, when the crisis breaks. Get a little plot of land in the country, sink a well, clear space for a garden, have trees around you for firewood. Country living is the best kind of living. Breathe fresh air for a change.

Food, water, heating fuel, electricity, and computers will be the Achilles' heel of most Americans in the coming Y2K crisis

The government may enact anti-hoarding laws within the next 6-12 months. So it is good to start preparing right now. Those storing up needed supplies may be blamed as "hoarders" and the cause of the panic and crisis.

You should provide basic supplies to last you for at least 6 weeks. Some people plan to stock up for 3 to 6 months. Some are preparing for a crisis which may last for a year or two.

There are several basics you should stock in your home: water, food, clothing, bedding, first aid supplies, tools, emergency supplies, and special items. You should also have a reliable non-electric heat source and, of course, shelter.

Even more basic: Write down everything—in any possible way—that you use in a day. Note other items which you use, but not every day. Then stockpile those items, so you can weather storms ahead.

WATER

Without water, you will be dead in 5 days. So it is a good place to begin our Y2K preparation list.

If you live in a city or town, you have a real problem. If you live on even a little acreage in the country, where you can sink a well, you can have water!

Get out of the cities—before it is too late and you cannot get out! Government controls could restrict travel from place to place. Beware, trouble is ahead. Y2K or no Y2K, big trouble is coming to the cities.

Where will you get your water when your local electrical power station stops providing it, and your local water utility ceases operations or no longer can treat the water?

You need water to drink, bathe, wash dishes and clothes, and operate the toilet. If you live in the country, you do not need to rely on an inside toilet. Then you only need water for drinking, washing, and bathing.

If you live in the country, you want to make sure you have a well, a stream, or a spring where you can get your water.

If you live in a city or town, you will need to haul in bottled water and store up a lot of it. But, even if you have a well, it would be good to have some extra water stored up.

A normally active person needs to drink at least two quarts of water each day. Hot environments and intense physical activity can double that amount. Children, nursing mothers, and ill people will need more.

Store 1 gallon of water per person per day (2 quarts for drink-

ing, 2 quarts for food preparation and sanitation). Keep at least a three-day supply of water in your home. Better yet, have more than that stockpiled.

Store water in thoroughly washed plastic, gass, fiberglass, or enamel-lined metal containers. Never use a container that has held toxic substnces becaues residue can be retained in the surface pores of the container. If you are not sure if a container is clean enough, only use the water in it for sanitation purposes, such as flushing the toilet.

Gradually stock up on water. Fill a number of gallon jugs. Purchase plastic 5-gallon buckets, clean them thoroughly (!), and then gradually fill a number of them with clean water. Because they are flat on top and bottom, they stack well. Fill them and stack them along a wall.

You may have a distiller, and can bottle water made in it. Another option is to gradually buy filtered or ozonated water (purchase extra bottles every week for months).

I always keep several 5-gallon buckets full of well water on hand. Where we live, storms knock out the electricity every so often. But the crisis ahead will require more than a few buckets.

Avoid using containers that will decompose or break. Do not store plastic bottles where the sun lights on them, lest the UV rays destroy them.

One expert suggests taking a waterbed and filling it with water. But you would need to add purification tablets, if you were going to later drink from it. A waterbed will hold approximately 175 gallons of water.

A relatively 15-foot plastic swimming pool will hold over 5,000 gallons of water. But, because of the various chemicals used to purify them, it is best to use the water only for washing and sanitary purposes.

You can purchase used 55-gallon metal drums (about $10 each), but beware of what was originally stored in them. Check with growers; you might be able to purchase drums which formerly held apple juice ($60 a drum). Legally, they are only supposed to be used once, so are available for you to purchase afterward. Many parts of the country grow apples. You can also buy new water tanks.

Place a washed-out drum at each corner of your house, and let the water from the gutters pour down into them. This water will prove a great help in middle of a dry summer when water is scarce.

Those 55-gallon drums are difficult to move, and difficult to get the water out of—unless you have a pumping device or some kind of spigot on the side. For household use, you would do well to gather lots of 5-gallon jugs. Military are the best, but Wal-Mart and other stores carry commercial containers for campers. These 5-gallon jugs are ideal for hauling water, but 1-gallon jugs are also very useful.

Consider 55-gallon plastic drums made specifically for water storage. Another more permanent solution is an underground, fiberglass storage tank. They can hold thousands of gallons of water but are relatatively expensive compared to the other solutions mentioned above. A 6 x 16-foot tank will hold 3,000 gallons.

Know where you can go to get more water, in an emergency.

If you have a well, purchase a well bucket, rope, and a pulley. Then you can manually haul water out of your well when there is no electricity. (A well bucket is a bucket narrow enough to fit down a drilled, lined well hole.)

An alternate method is to purchase a hand pump. However, many find the bucket works more efficiently. Hand and solar pumps are also available. You should have a hand pump or a solar pump on hand as a backup—just in case.

There are special catalogs where you can purchase special items like well hand-pumps, well buckets, and solar well-pumps. We will list some later. For example, on p. 112 of the latest Lehman's Non-electric Catalog, solar well-pump kits are listed (330-857-5757). Another source for solar pumps is Golden Genesis Company, Scottsdale, Arizona (602-948-8003).

Another alternative is to rig up gutters and downspouts, to drain water from your roof into barrels or a cistern. If you filter the roof-water runoff through an old nylon stocking, cheese cloth, or other thin cloth, this water can be boiled and used. (However, nearly 40 years ago, I found that roof water generally contains asphalt or aluminum, depending on whether it comes from a house roof or the top of a mobile home.) Be careful what kind of water you drink! One source says that painting your roof with white *Cool Seal* will reduce the asphalt in the water runoff from the roof.

Because it may contain asphalt, it is best to only use roof water for washing, bathing, flushing, and watering your garden.

Then there is water purification. This can be a key to long-

term survival, if you are not sure of the water in the creek or well. If you have water purification equipment, a wider range of water sources are available to you. Water filters today can literally purify swamp and sewer water, and should be obtained now while they are still available. Katadyn, Pur, and Sweetwater are a few of the best brand names. Purchase a portable filter unit for each member of your family, and get one or two counter-top drip models if possible.

If you store water, an excellent way to preserve and keep it potable [which means drinkable] is to add one tablespoon of 3% hydrogen peroxide per gallon, keep it tightly closed and in a cool place, and it will store indefinitely.

If you live in an area where it is difficult to store water, or you do not have a well, consider purchasing a large water tank you can place on a trailer or in the bed of a truck.

Military water buffalotrailers are a good solution for those who can afford them. Each one holds at least 400 gallons and some are insulated. You can use it to haul water from a water source to your home. But you must be able to pump and (if necessary, purify) water without electricity.

If you live in a city, the need to flush toilets can be a problem, and you will need water for this purpose also. Without electricity, your municipal sewage system will probably shut down. Portable toilets with chemicals to neutralize waste are available. Do not ignore basic sanitation. Cholera is not something to be desired.

Here is more detailed information on purifying water:

Untreated water could be unsafe because of disease carrying microbes or because of chemical contaminants such as heavy metals, salts, or pesticides. Contaminated water may be present, even though the water smells okay. It might contain microoganisms that cause diseases such as dysentery, typhoid, and hepatitis. You should purify all water of uncertain purity before using it for drinking, food preparation, or personal hygiene.

There are four ways to purify water:

1 - *Boiling:* Bring water to a rolling boil for 3-5 minutes, keeping in mind that some will evaporate. Let it cool before drinking. Boiled water will taste better if you pour it back and forth between two clean containers to restore the oxygen content. This technique will also improve the taste of stored water. Boiling will kill mi-

crobes, but will not remove chemical contaminants.

2. *Disinfection:* Liquid bleach (Chlorox, Purex, etc.) can be used to kill microorganisms in the water. But do not used bleach which are color-safe, scented, or have added cleaners. Add 16 drops of bleach per gallon of water, stir, and let it stand for 30 minutes. If the water does not have a slight odor of bleach, add another 16 drops and let it stand another 15 minutes.

3. *Filtration:* This removes microbes, but not chemicals. There are two kinds:

The inexpensive kinds use paper or charcoal to do the filtering, but they need to be replaced frequently (Pur Explorer and First Need are two such brand names).

The expensive kinds are ceramic filters. They cost nearly $200, but can treat as much as 15,000 gallons of water before needing replacement. Both the UN and Red Cross use the Swiss Katadyn brand. It can uses a 50-psi hand pump to treat up to 1.2 quarts per minute. It is said to be able to purify very dirty water.

4. *Distillation:* Water is boiled and the vapor is condensed and collected. This is the only method which will remove both microbes and chemicals. Tie a cup right-side-up to the central -top handle of a lid. Then put the lid upside down over a pot of water and let it boil. Water will flow down the lid into the cup, producing distilled water.

Solar still uses the heat of the sun to produce distilled water. Very little water is produced each hour, but no fuel is required.

FOOD

In the United States, at any given time there is a three-day supply of food on hand. The lettuce you buy was picked four days ago. When a disaster, such as a hurricane, occurs, there is a rush on grocery stores and the food is gone within three hours.

Increase your food supply to a minimum of 6 weeks, especially canned goods. (Some Y2K-knowledgeable experts warn that you should have as much as a two-years' supply for each family member.) Make sure you have a manual can opener. Especially select foods which no require no refrigeration, preparation, or cooking, and take little or no water to prepare. Such foods would include:

Ready-to-eat canned fruits and vegetables.

Canned juices and soup.

Staples: sugar, salt.

High-energy foods: peanut butter, granola bars, trail mix, honey, molasses.

Vitamin supplements.

Foods for infants, elderly persons, or persons on special diets.

Possibly dried fruit, if you can afford it. (Freeze-dried foods are excellent, but very expensive.)

Some recommend that you plan not to heat food and if so, include a few cans of Sterno.

However, if you are properly prepared, you will have a wood stove and can cook on top of that. More on heating and cooking below.

Food is cheap today. It may not be later. The problem is not the supply of grain in the field. It is the delivery system. First, as we near the end of 1999, there will be an increasing run on rice, beans, etc. This could cause shortages. Second, computers control the shipping of food and other commodities throughout the nation. When the computers go down, the food supply could be cut off for an undisclosed period of time.

It is estimated that one adult needs 1,000 pounds of food per year. The diet should consist of about 50% grains, beans, and rice. Vegetables should be another 50%. In addition, you will need a little vegetable oil, salt, etc.

Bulk foods to stock up on would include corn, rice, wheat, pinto and navy beans, oats, salt, and honey in bulk. If you have wheat, soybeans, and corn,—you have a perfect protein!

Go to a cheap food outlet (such as Sam's Club or Costco) and buy such staples: beans, rice, and corn. Or purchase your wheat and soybeans at a local co-op. (But if you get anything at a co-op, make sure it is not treated seed! Insecticides might have been added.)

Wheat in the field is only $2.50 a bushel (60 lbs.), or 4 cents a pound. At that rate, it would only cost $1.50 to fill one of your buckets with good wheat! Wheat at the co-op costs more, but still far less than the flour at the grocery store. When you go to the co-op, make sure you get triple-cleaned wheat. Lacking the bits of sand, it is less likely to wear out your high-speed grinder as quickly.

If you do not know where to start, here is a basic suggestion: Estimate how much wheat, corn, and beans you would use in a week, if you did not have any other source of carbohydrates and

proteins. Then go out and purchase a year's supply of whole wheat, corn, and beans. If you buy 50 lb. sacks, this will only cost a couple hundred dollars or so. Be sure and specify that you want food-grade product; otherwise you could get seed wheat, etc., which has a poisonous coating to repel insects.

Purchase garbage cans (tinned steel or plastic) with tight-fitting lids. Store your dry staples in them.

Also useful are 5-gallon buckets, especially those with screw-on lids. M&M Industries makes a good one. A case of 6 (with lids), shipped, is about $40, depending on address mailed to (316 Corporate Place, Chattanooga, TN 37419 / 800-331-5305). An excellent source for 5-gallon buckets (but without the screw-on lids), are the fast-food restaurants. Buy their empty buckets for 50 cents or $1 each; take them home and wash them out well. These can be used for food or water. You can estimate that about 35 pounds of grain or beans will fill each bucket.

Have a manual grain grinder so you can make flour when you need it from your staples.

Learn to make good bread. Grind your wheat, soybeans, and corn in your grinder (use a high-speed electric grinder before the crisis; a hand grinder during it). Mix them together in these proportions: $40% wheat, $40% corn, and 20% soybeans. Add some yeast, knead it, let it rise, then bake. You will have all the major amino acids in that bread. (However, you will have to learn to like the taste; it is a little different.)

Over a period of time, you will be stocking up on the various foodstuffs. But then, during storage, insects will want to claim their share.

As soon as you get your latest order of dry staples (wheat, beans, corn, etc.), put it in your freezer for 3 days. This will help kill a majority of the bugs that were included in the shipment. But that will not eliminate them all.

Next, the experts advise that you mix a cupful of diatomaceous earth (DE) into each bucketful of wheat. This primarily consists of calcium. Yet it is a special kind, which big bugs and post-larval bugs choke on. DE is said to be harmless to people, if the silica content is 1% or less. It kills bugs by dehydrating them. DE costs about 90 cents to a dollar per pound, plus shipping. Your co-op may sell it. (Nitron Industries is an organic gardening company,

which sells DE for about $24 for 20 lbs. P.O. Box 1447, Fayetteville, AR 72702 / 501-587-1777.)

Unfortunately, not only the bugs but the very air is hazardous to your stored foods. As you may know, it is the air in the jar (the oxygen and humidity in that air) which, along with warmth, works to destroy the food value of the contents of each jar. There is now a gadget which removes the air from the jar so you can seal it! Normally, one has to boil the jar and contents in order to create a "vacuum pack." But foods you do not want to boil can be sealed with a Pump-n-Seal.

Pump-n-Seal is used to seal both jars and good-quality zipper locking plastic freezer bags. Recommended jarred foods include soups, salads, berries, beans, cooking oils, chips, nuts, etc. It can be used on nut mixes, cooking oils, and other oil foods. It helps prevent freezer burn and preserve freshness in frozen foods. Of course, it would also be excellent, not only for food, but for storing garden seeds in jars.

Pump-n-Seal, Pioneering Concepts, Inc., P.O. Box 2346, Naperville, IL 60567 (630-553-2340; fax 630-553-2380)

For long shelf-life food reserves, call Intenrational Collectors Associates (800-525-9556).

Get to know farmers who will sell or barter their produce to you. More on bartering later in this book.

FOOD FROM THE GARDEN

If you do not know much about gardening, begin practicing! Plant a garden this summer! Do not wait for a crisis to begin learning how to raise your own food. Buy non-hybrid garden seed, and plant some this summer. Learn how to save some of the seed for the next year.

This fall, stock up on non-hybrid seed for next year. Non-hybrid (reproducible seeds) are available from Pinetree Garden Seeds, Box 300, New Gloucester, ME 04260; also from R.H. Schumway, Box 1, Graniteville, SC 29829.

After the growing season, buy small packets of garden seeds (then available at lowest cost) and store them for barter or future gardens.

Keep your food storage program very private, known only to your immediate family or closest friends. You can and should share

with whom you like, but not because hungry, unprepared neighbors or marauders forcibly beat your door down and seize your reserves.

You can always grow a variety of foodstuffs in the summer months, but you also need food for winter.

Hubbard squash (a winter squash) and kale are two of the best. Grow the squash this summer and harvest it this fall. Spread it out on newspapers in a cool, dry place—and it will last through the winter and provide you with excellent starchy food. Hubbard is one of the best-keeping of the winter squashes. (If you did not know it, pumpkins very quickly spoil.)

Then there is kale. Collards do better in the heat of the summer, and for use in the summer and early fall. But, in many parts of the nation, kale can overwinter in the ground! Order a sizeable amount of kale and plant it in late summer (where I live, in eastern Tennessee, August 1-15 is the date to plant it.) It will provide fresh cooking greens throughout the winter and early spring! All through the winter you can go out and harvest some leaves. It will not grow during the winter, but it will not die—unless a severe freeze occurs.

You will want to have seed on hand for the summer after the turn of the century. Asgrow (Kalamazoo, Michigan) is a large company which sells vacuum-packed cans of seeds. Buy a few cans and you will have lots of seeds for summer and fall planting in the year 2000. But remember: as soon as you open the can, outside moisture will began degrading the quality of the seed.

If you only have a lawn around your home, tear up part of it—and plant a summer and fall garden. But be sure and check the pH. Do a soil test and find out if you need to add some lime to sweeten the soil. Most vegetables like a soil which is generally more alkaline than most in the eastern states. (Out west, the soil is less acid.)

If you do not have a soil test kit, you can collect a few samples from various areas of your proposed garden plot—and mail it to your state agriculture station, or to a state college. For $10 or so, they will test the soil for you and send you a report in a few weeks. Phone your local ag agent and he will explain what to do. You will find him listed in your phone book under "(County name) Extension Service."

If you have access to rotted manure, put some on your garden

plot to help build it up. But you must begin preparing your garden now; do not wait until later. If you can only haul in fresh manure, get it this spring and let it set for six months. If you know how to compost, all the better. Crops grow far better in soil which has been properly fertilized. But do not use chemical fertilizers! They only injure your soil and kill the earthworms and microzyma.

If you garden, you will need canning jars and related supplies; and a hand grinder for corn, wheat, and other grains. That was discussed in the preceding section on food.

HEATING FUEL

One or more heat sources are also needed, not only to warm you and cook your food, but also to keep the pipes from freezing.

You must have an alternative to electricity! Purchase a non-electric heating source. The simplest is a stand-alone, non-vented propane heater.

If you are relying on propane, make sure your tank is full. Consider having a second tank installed for awhile.

If you have a source of firewood, install a woodstove! A good wood stove can heat 2,000 sq. ft. of living space. There are places out west where firewood is difficult to find, but there is usually plenty of it in the eastern states.

Be sure and use insulated pipe, where it runs through the wall. Make sure the chimney has a liner in it. Woodstoves can cause chimney fires, so you must take special precautions with them, which would not be necessary with propane. Wood heat can produce a lot of rather sudden heat in the chimney. In addition, wood smoke tends to build up a creosote which occasionally can start a chimney fire.

What kind of woodstove should you get? The better-made (and more expensive) are lined with firebrick, or something similar, and will last a long time. They are tighter, and will hold wood heat through the night. In this way, if you select a large log in the evening, and bank down the stove, you will not have to wake up to an alarm clock in the middle of the night to refill the stove! Make sure the stove top is flat, so you can cook on it. The stove should be large enough to heat your home.

If you cannot afford such an expensive stove, you can buy a cheap, thin-wall model at the hardware store. Although it will not

last for many years, it will get you through Y2K. Such a stove generally will have to be refilled halfway through the night (unless you want to let it go out and then start a fire in a cold house the next morning.)

Used, goodstoves are most often available in the spring. That is the best time to buy a good one at a lower price.

If the wood stove does not have an integral blower fan—to push out the hot air,—place a fan behind or above the stove. This applies to any other kind of house-heating source. (Of course, when there is no electricity, you will not be able to use that fan.) It is possible to purchase stove fans which run from the heat and move the heated air.

If you have always wished to have a fireplace, you might want to build it this year and stock plenty of wood for it by winter time. (However, woodstoves provide far more heat than fireplaces.) If you have a fireplace, you can increase the heating efficiency with an insert. You can go from 15% to 80-90% efficiency by purchasing and installing one.

If you live in the city, the experts recommend that you keep the firewood in your garage, out of sight. Otherwise it might be stolen at night. (That is what happened in Watertown, NY, earlier this year, during a three-week power blackout during an icestorm.) If you live in the country, you will need a shed or tarp to keep the wood dry.

Stoves, firewood, and a number of other things mentioned in this book, should be purchased before October 1999. Do not forget to purchase and store 1 or 2 complete sets of interior chimney pipe (elbows, joints, etc.)

Purchase 1 or 2 good wood-splitting mauls, axes, hatchets, and some extra handles.

You might want to get a crosscut saw and Swede saw. A chainsaw (and supplies: oil, gas, tools, spare chains, and sharpener) is a must if you are going to cut your own wood.

Cast-iron cooking utensils are great for a woodstove.

Those who live in apartments can get a small camper's cooking stove, or a small wood or propane stove. However, camping-type stoves and heaters should only be used ot of doors in a well-ventilated area. If you do purchase an alternative heating device, make sure it is approved for use indoors and is listed with the

Underwriters Laboratories (UL). It is best not to heat the house with the oven or top burners of a propane cookstove. This is because of the fumes emitted. (However, in an emergency, use them anyway.)

There are numerous camping cookstoves available. Be sure to have extra fuel and matches for the stove, and only use it outdoors. A dozen or two large cans of sterno for cooking could be useful.

In case the power fails, plan to use alternative cooking devices in accordance with manufacturer's instructions. Do not use open flames or charcoal grills indoors.

You will need a reliable non-electric way to heat your home and cook your food. Propane is very handy. (LP [liquid propane] gas is another name for propane.) You cannot store electricity, but you can store propane. The author is installing a second 500-gallon propane tank in his yard. He will make sure that both of them are filled by mid-December 1999. A friend at the propane company quietly told him to make sure it was installed not later than summer 1999—to avoid the rush.

For those who are interested, solar heat is available—if you live in an area which has lots of cloudless days. One source of solar equipment is Kent Morgan, 8534 E. 37th Place, Suite 200, Indianapolis, IN 46226 (317-465-8496). More on solar energy in the next section.

ALTERNATE ELECTRICITY SOURCES

If you live in an area where you can legally and functionally have one, a generator can be very useful. (Another reason why you want to live in the country; they are not appreciated in urban areas because they are noisy). Frankly, none of us appreciate their noise; yet, in an emergency, they will be very much appreciated.

Generators designed for camping or recreational vehicle usage (1,000 - 5,000 watts) have insufficient capacity to handle the load requirements of even a small home. Only a few pieces of equipment can be operated at a time.

An adequately sized, high-quality generator (16,000 - 20,000 watts), on the other hand, will be quite expensive to purchase ($6,000-$8,000), and will require large amonts of fuel whenever it is running.

(One expert recommends that, if you wish to use a backup generator for an extended period, you need to install a group of deep-cycle marine or industrial batteries, an electronic controller, and a converter which converts direct current (DC) to alternating current (AC). If you choose this system, you will need to get an expert to design and install it for you.)

If you plan to use a portable generator, connect what you want to power directly to the generator. do not connect the generator to your home's electrical system. Reason: If the power company suddenly turned the electricity on, it could burn up your generator!

A couple weeks ago, we had a direct line to a generator wired into our office. Another was installed in the print shop. When the crisis comes, we turn the generators on. When not in use, the generators are on wheels and are stored in a sheltered place, such as a garage.

Select those appliances you wish to be on a special wiring circuit to the generator. Ideally, this would include the following:

Washing machine.
Dryer (or omit).
Freezer.
Refrigerator.
Certain kitchen outlets for table-top appliances (blenders, etc.).
Certain lights, preferably those in the kitchen.

Keep in mind the following principle:

Electric heating devices (dryers, water heaters, cook stoves, heaters) use a lot of power! Larger motors do also. Motors require extra power when they first start. Therefore, do not operate electric heating devices from your generator. Only operate one or two larger appliances at a time.

Depending on the size of your generator, you might (might not) be able to operate the freezer, refrigerator, radio (for the latest news), and kitchen lights at the same time. But do not start the motor items (freezer and refrigerator) at the same time! Pull the plug on one before starting the generator.

You may wish to purchase a 5,000 watt model. However, some folk have been successful buying two 1,200 watt models. They can be used in different places.

But even the 5,000 watt generators will only operate a few things

at a time. Check it out in advance and find what you can do. Have the special wiring circuit installed and tested before the crisis comes. Know ahead of time what you can, and cannot do with your generator. Then operate the generator several hours each day. During that time, the food is being chilled again and you are rushing around the kitchen while listening to the news, to find out what the government and the cities are doing.

At the end of this book is a voltage reference guide—so you can know in advance what a generator can handle. In this way, you will be able to make a wiser choice when selecting the size of generator to purchase!

If you have a generator which can operate several hours each day to keep your home freezer cold, this will greatly help. However, you can never know what may happen. It is terrible to lose a freezer full of food! If in doubt as to what is ahead, eat all the food in your freezer by the end of the year. (The only way you can know you can make it is to install a generator, and test it on your refrigerator and freezer a few hours a day, for several days, and see if it can handle the load and keep the food cold as it should be.)

Keep the generator in a well-ventilated area (because it has gasoline in it), either outside or in a garage, keeping a door ajar. Do not put a generator in your basement or anywhere inside your home.

Plan ahead: Arrange to operate the generator so that it is not so loud when running. To lessen the noise, either have some insulation board partially around it, or place it in a hole in the ground, ensuring that surface water will not flow into it.

If possible, the generator should have a multi-fuel capacity (able to operate on either propane or diesel). Buy one between 8 Kwh to 12 Kwh, if possible.

Generators can use gasoline, diesel fuel, natural gas, or propane. Either of the last two options is recommended for safety and greater ease of fuel storage.

Honda generators are the best gasoline generators on the market. They run longer on a gallon of gasoline , are quieter, and easier to start than the cheap models with a Briggs and Straton engine. Honda engines are also easier to work on.

Then there is the matter of fuel tanks. Check with a local agriculture supply house or with local farmers and ranchers. They may have used tanks no longer in use which they will be glad to dispose of at low cost, if you will haul it off.

Diesel fuel is more stable than gasoline, stores better and longer, and is less explosive. Be sure you place any fuel storage tanks in a safe area, away from your home and any machinery that may spark or ignite the fuel. Gasoline or diesel tanks (300 or 500 gallon size), the kind you see standing on stands in farmers' and ranchers' yards in the country, can be bought from agriculture supply houses in small towns and refilled monthly.

Regarding fuel in tanks, keep in mind that there may be disruptions in delivery and the possibility of rationing, should shortages develop.

If you are going to store gasoline over 4 months, treat it all with Sta-bil. Sta-bil is a compound which keeps the gas in stabilized form for months.

If you put Sta-bil in the gas tank of the generator and run it for a few minutes, you can shut it off and not worry about the gas that is in the carburetor gumming up and make future starting difficult. The gas can remain in your machine for a whole year and still crank up easily.

Solar grids can also be used to produce electricity. Solar cooking and solar lanterns are available. Kits are available.

A solar energy system, though initially more expensive, is ultimately simpler, safer, easier to maintain and requires no fuel (except sunlight). If you are considering this, consult an expert on whether you should use either a generator/battery/converter system or a solar system.

Wind generators can also be used as an alternate electrical energy source. But you need to live in the midwest or on a mountaintop, where there is a lot of wind.

For more information on energy back-up systems, send $10 to Year 2000 Survival Newsletter, P.O. Box 84910, Phoenix, AZ 85071 (800-528-0559). for the special issue on back-up energy systems.

An emergency generator, or power source of some kind, is important. Keep in mind that, without electricity, you cannot pump water out of a 300-foot well (although you can get it out with a well bucket).

Consider converting all or part of your appliances (dryers, water heater, cookstove, freezer, and/or refrigerator) to either propane or natural gas. Buy or lease the largest gas tank and keep it topped off monthly.

Before concluding this section, before you spend money on solar power or wind generator systems, know that it will work where you live!

Solar power is great in states such as New Mexico and Arizona. But it is far less efficient in the eastern part of the country, especially east of a north-south line running through Chicago. Too cloudy.

Wind generators are outstanding if you live in very windy areas, but less so elsewhere. From Texas north to the Dakotas is windy country. Mountain ridges where the wind can blow in from the west or north are good. The first ridge next to the Pacific Ocean and the tops of mountains are also good. It has been said that if most of North Dakota were covered with wind generators, there would still be room for the same number of cattle—yet a sizeable portion of America could be electrified from it.

ALTERNATE LIGHTING

Buy several dozen candles, and at least a dozen boxes of strike-anywhere matches. Butane lighters are also good.

Purchase some kerosene lamps and several gallons of kerosene. If you suspect the crisis may last for some time, you may want 5-10 gallons. Also get spare wicks.

Aladdin lamps are best, but cost up to $65 and require special Aladdin oil. Like Coleman lamps, they require special fuel and provide a white light. Such lamps burn cleaner and, in the evening, are much brighter to read by.

Kerosene lamps can be purchased at Wal-Mart or at surplus stores, generally for under $25 each.

Purchase several flashlights, a dozen or more rechargeable batteries, and a 12-volt battery charger. Or, if you will have no alternate electrical energy source to recharge batteries, purchase a quantity of alkaline batteries (they store better and outlast regular batteries). Do not forget replacement flashlight bulbs.

CLOTHING AND BEDDING

Basically, you should have extra blankets, coats, hats, and gloves to keep warm. Buy warm winter clothing, long underwear, etc., and lots of it. You want enough to last several years. When you can dress warm, you are better prepared for whatever may happen.

You need durable work clothing, shoes, and boots. A lot of our

clothing is imported from China, and the shipping industry is not Y2K-compliant.

Warm shirts
Durable pants or dresses
Sturdy shoes or work boots
Rain gear
Blankets or sleeping bags
Pull-down thick caps, or wool hats
Leather work gloves
Thermal underwear
Protective clothing (coveralls, overalls, etc.)
Sunglasses

Ladies should make sure they own some comfortable, durable walking shoes.

Bedding is also important:

You should have several warm, wool army blankets for each member of the family, and a dozen more for other friends or relatives who may arrive. Warm sleeping bags, which can withstand temperatures down to zero, are very useful.

Make sure you have several hot water bottles, to help keep you warm in bed. You cannot be sure how the heating situation may turn out.

PREPARING THE HOUSE

In addition to other points mentioned in this book, here are a few more:

Y2K will begin in the dead of winter. Prepare your house for the coming crisis. Install storm windows to help hold the heat in. Or purchase a roll of clear, plastic sheeting. Have it ready and, if you need to next winter, tack it up over leaky windows to keep the cold out.

Locate those passageway areas where you should drive nails, and put up blankets to help keep the heat in certain quarters. Figure out which rooms you can close off and not heat.

If you have a fireplace, place a plyboard over it to close it off. (Otherwise air from the living room will keep going up the fireplace chimney.) Install a good woodstove.

HOUSEHOLD ITEMS

List the items you regularly use in your home over a week's time. These are the things you need to have extra on hand!

Liquid soap
Detergent
Toilet paper
Matches and disposable butane lighters

A little thought will suggest many other household items you will need.

Sam's Club has a 50-page catalog of all its standard products. Ask the manager for a copy. From it, make a list of what you need! If you are able to do so, you can place an order and then borrow a pickup and get it.

Here are some sample prices at Sam's:

Laundry detergent: 40-lb. bucket - $10.

Toilet paper: Case (60 rolls, 500 sheets, double-ply) - $25.

Disposable lighters: 50 - $10.

You will need trash bags, paper towels, razors, etc.

Also keep in mind light bulbs, duct tape (several rolls), stamps, and envelopes.

If soap may become scarce, laundry disks are helpful. They can do hundreds of loads with little or no soap.

Do not forget canning equipment, jars, etc. Keep this ratio in mind: For each 100 jars, you need 100 rings and 300 lids.

Purchase a hand-powered mill for grinding flour or meal.

SANITATION

Here is a list of sanitation items you will want to keep on hand:

Toilet paper, towelettes
Soap, liquid detergent
Feminine supplies
Personal hygiene items
Plastic garbage bags, ties
Plastic bucket with lid
Disinfectant
Household chlorine bleach
Baking soda (for odors)
Agricultural lime (for sanitation purposes)

SPECIAL ITEMS

There will be family members who have special needs which should be considered.

For the infant:

Formula
Diapers
Bottles

For adults:

Heart and blood pressure mdication
Insulin
Prescription drugs
Denture needs
Contact lenses and supplies
Extra eye glasses
Books
A sewing kit with polyester thread

MEDICAL SUPPLIES

Do you need a regular supply of medical products? If so, store them up gradually ahead of time, so you will have a 3-4 months' supply at the turn of the century. This would include both prescription and non-prescription medications which you regularly use.

Begin purchasing any special medications in 90-day quantities and renew your prescriptions early.

FIRST AID KIT

Assemble a first-aid kit for your home and one for each car. The experts advise that you include all of the following:

Sterile adhesive bandages in assorted sizes
2-inch sterile gauze pads (4-6)
4- to 9-inch sterile gauze pads (4-6)
Hypoallergenic adhesive tape
Triangular bandages (3)
2-inch sterile roller bandages (3 rolls)
3-inch sterile roller bandages (3 rolls)
Scissors
Tweezers
Needle
Moistened towelettes
Antiseptic

Thermometer
Tongue blades (2)
Tube of petroleium jelly or other lubricant
Assorted sizes of safety pins
Cleansing agent/soap
Latex gloves (2 pair)
Sunscreen
Activated charcoal

Herbal remedies (preferably in tincture form which retain their potency the longest) should also be included in your medical chest. Have extra cayenne pepper powder on hand. It can be used to stop bleeeding, arrest a heart attack, and do many other things. Slippery elm powder is excellent for the stomach, dysentery, and as a food supplement. Also keep white willow bark, genger, Barley Green, rice bran, and Hawthorne berry syrup on hand. Store up extra vitamins.

Echinacea, astragalus, Dr. Christopher's Anti-Plague Formula, and Vitamin C are useful. Taking all four every hour helps neutralize an emerging cold or flu.

There are many herbal supply houses. One source of pure, high-strength herbs is American Botanical Pharmacy, P.O. Box 3027, Santa Monica, CA 90408 (310-453-1987).

Essential oils have the longest shelf life of all plants. Their anti-microbial, anti-viral, anti-bacterial, anti-fungal properties are very powerful. For a personalized family health kit, call Essential Oils Healthline (602-430-7700 or, toll free, 877-571-7137).

HOUSEHOLD EQUIPMENT

Buy extra batteries of all sizes for radios, clocks and other battery operated products. Hand-pumped flashlights do not require batteries and are useful.

For reliable fire starters, obtain a large supply of long-burning candles, matches, and butane lighters.

Certain household equipment should be checked on, including your smoke alarms. If they are hard-wired into your home's electrical system (most newer ones are), check to see if they have battery backups. Each fall, replace all batteries in smoke alarms as a general fire safety precaution.

Check on other equipment. Know what will still operate when the electricity goes off. Keep extra batteries on hand.

A wash tub and hand wringer would be handy to have. But if you have a generator, you can turn it on at certain hours and cool the refrigerator and freezer while you wash clothes and hear the latest news on the radio.

It was mentioned earlier that, in view of what is ahead, a gas (propane or natural gas) washer, dryer, water heater, cookstove, freezer, and refrigerator are better than the electric-operated kind.

Cast iron cookware that can be used on stoves or open fires are useful.

ALTERNATIVE COMMUNICATIONS

Purchase a shortwave-world band radio receiver so you can keep up with what is happening in the world. This is vital in case of riots in the cities and subsequent government takeover because of the severity of the crisis. The radio equipment should have an optional battery pack. Or listen to an electric one at those times you operate your generator to cool the refrigerator and freezer, etc. Sony has an excellent shortwave model that can receive world-wide, yet is small enough to fit into the palm of your hand. Grundig is another good brand.

Some survival experts recommend that you also get small, hand-held two-way shortwave radios (transceivers) for each member of your family (15 years old and up). Each one will transmit 10-15 miles. However, a general-class amateur license or technician-class amateur liceses is required. An alternate method is small, hand-held walkie-talkies, which can communicate on citizen band about half a mile. Transceivers on amateur radio frequencies can reach out to 10 miles.

A scanner can be used to tell you what is happening locally, but local the local radio news may substitute. Here are some ham and radio equipment sources: Ham Radio Outlet (800-854-6046); Amateur Electronic Supply (800-558-0411); Texas Towers (800-272-3467); Radio Shack sells transceivers for citizens band. Radios which operate on solar or hand crank power are also available.

You might want to buy an inexpensive used CB (civilian band) radio home station and car CB for inexpensive local emergency communications.

ELECTRONIC EQUIPMENT

Check with manufacturers of any essential computer-controlled

electronic equipment in your home or business, to see if that equipment may be affected. This would include fire and security alarm systems, programmable thermostats, appliances, consumer electronics, garage -door openers, electronic locks, and any other electronic equipment in which an embedded chip may control its operation.

Sell your old pre-1997 computer and purchase a new one with new softwear and Windows 98 (It has a bios fix for many PC problems.) You can check your computers with Ymark2000 program.

The following items would be very helpful during emergency conditions:

Solar battery charger ($15).

Solar powered am/fm/sw radio ($20).

Quartz battery-powered clock ($10).

Battery tester ($5).

PERSONAL COMPUTERS

It is an unfortunate fact that a majority of personal computers are non-Y2K compliant. As recently as last year, the BIOS (basic input output/system) in most PCs were still being programmed to roll over to January 1, 1980! If your system is based on an Intel Pentium-90 chip, it probably will not function correctly after the century changes! Because this is a BIOS problem, it matters not what brand of personal computer you have. It has been estimated that 75 percent of PCs are non-compliant.

And there are other problems. Current computer hardware can be at fault:

> "Noncompliance in hardware devices and PC BIOSs can cause equipment to fail or misinterpret 21st century dates as 20th century ones. Some PC BIOSs will work after January 1, 2000, but cannot roll over on their own past December 31, 1999. Others require a BIOS fix in order to recognize any dates in the next century."—*PC Magazine, October 6, 1998.*

Or the problem can be in current software:

> "Year 2000 compliance in off-the-shelf software, custom applications, and data files is much trickier to pinpoint. Problems can be as basic as a 2-digit year field mask or as complex as a lengthy calculation on a date value buried in a code snippet. Worse, a date problem can arise in a seemingly compliant application due to [a 2-digit] data entry."—*Ibid.*

PC problems occur in four areas: the two-digit code in commercial PC software, the BIOS chips that control PC hardware functions, the habit of entering two-digit dates in spreadsheets and databases (when four-digit entries could be used), and the embedded code in the hardware and software.

For a quick check on what your computer will do on January 1, 2000, simply change the date on your PC to December 31, 1999, and the time to 11:55 p.m. Ten minutes later, the computer should have a correct date of January 1, 2000, and the time to 12:05 p.m. If it does, your computer is Y2K compatible. But that does not mean that all your software is. Test software in the same manner. Contact companies and obtain certified *Y2K-compatible* equipment and software. For legal reasons, they are not likely to declare it "Y2K-compatible" unless it really is.

If you would like extensive guidance for checking out your own computer equipment and software, consult the October 6, 1998, issue of *PC Magazine*. Do not expect a lot of help from software firms and vendors. They have been told by their lawyers not to say much. They generally refuse to provide compliance data or say the software (even though made in 1997) is too old to fix and therefore not compliant. So, if they say something is "Y2K-compliant," it probably is.

Surely, we are nearing the end. Crises seem to be mounting on all sides. But the faithful will remain in the hollow of God's hand.

TOOLS AND SUPPLIES

Some of the following items reflect the fact that you may need to relocate:

Mess kits—paper cups, plates and plastic utinsils
Emergency preparedness manual
Battery operated radio and extra batteries
Flashlight and extra batteries
Cash or traveler's checks, change
Non-electric can opener, utility knife
Fire extinguisher (small canister, ABC type)
Tube tent
Pliers
Tape
Compass

Matches in a waterproof container
Aluminum foil
Plastic storage containers
Signal flare
Paper, pencils
Needles, thread
Shut-off wrench, to turn off household gas and water
Whistle
Plastic Sheeting
Map of the area (for locating shelters)

We earlier mentioned the need for a chain saw and supplies, axes, mauls, hatchets.

Do not forget adequate garden tools.

SURVIVAL KIT

This what the U.S. Armed Forces tells its men to include in their survival kit:

Lightweight, roll-up raincoat.
A broad-brimmed, lightweight hat (in hot climates).
A knitted cap, to cover head and ears, and extra gloves or mittens (in cold climates).
A change of underwear and socks.
Roll-up 4-foot seine (poles can be fashioned-form available sticks or other wood found near a stream). [A seine is a fishing net, especially a long one that hangs vertically in the water and is supported by floats on its upper edge and kept taut by weights on the bottom edge.]
Waterproof, stike-anywhere matches.
Waterproof, batteryless flashlight.
Candle stub (beside light, candle wax is useful for plugging, patching, and starting fires).
Fire starter.
Toilet paper.
Insect repellent (in plastic squeeze bottle).
Sunscreen lotion or cream.
Sunglasses.
Signal mirror.
Two smoke signals.
Two flares.
Compass.

Appropriate topographic maps.
Halazone tablets for purifying water.
Two dozen assorted fishhooks.
50 feet of 50-lb. test monofilament line.
Brass swivels and 25 feet of light wire for rigging snares.
Swiss Army-type pocket knife.
Needle and thread.
25 feet of parachute cord or other heavy-duty nylon line.
Short file or whetstone.
Ax or hatchet.
A strong saw—easily stored, yet sturdy enough to take down trees many inches in diameter.
Plastic pack of bouillon cubes and chocolate packs to mix with water.
1 square yard of aluminum foil.
Antiseptic cream.
Small pad and pencil.

TRANSPORTATION

Keep your automobile's gas tank full in the last weeks before the turn of the year. As soon as the electricity goes out, it will be impossible to pump gas at gasoline stations.

Consider contacting a fuel company and having them set a gasoline tank on your property. They will be glad to do this since they will be selling you the gasoline. But do not wait; get the tank installed early!

Disadvantages of a tank installation are these: (1) You may pay a little more per gallon for gasoline. (2) The inside of the tank can gradually acquire water in the bottom of the tank from condensation (yet the outlet is generally a little higher than the tank bottom). In other words, gasoline in one of those home tanks can be a little dirty. The larger the tank the cleaner it is. (3) You will not have the brand of gasoline you normally prefer (if you care about such matters.)

However, in a crisis, the advantages far outweigh the disadvantages! That tank, filled, will hold from 50 to 150 gallons, and would provide you with enough gasoline to run your car for quite some time. And that could be worth a lot to you!

Acquire alternate transportation in the event that the system goes down for a long time and fuel becomes scarce or unavailable.

This might include bicycles, mountain bikers, motor scooters, trail bikes, ATV quadrunners, or motorcycles. Some of these use fuel, but in smaller amounts.

IMPORTANT DOCUMENTS

There will be important family documents which you should keep in a waterproof, portable container. Make sure the following the following includes addresses and phone numbers.

Will, insurance policies, contracts, deeds, stocks and bonds.

Passports, social security cards, immunization records.

Bank account numbers, credit card account numbers and companies.

Inventory of valuable household goods, important telephone numbers, family records (birth, marriage, death certificates).

PERSONAL FINANCES

There is the possibility that you may have difficulty withdrawing money from your bank at certain times in late 1999 and early 2000, not necessarily because the banks have Y2K problems (they were supposed to be all fixed by April 1999)—but because so many people will panic and withdraw their savings. Therefore, you may find it wise to withdraw enough to tide you through the first months of 2000. Have all your cash in small denominations.

If the banking system shut down for a month, what would happen to you, to your employer, your employment, your retirement fund, and your pension?

When the banks reopened, would more bank runs shut them down again?

This is why you would do well to slowly begin removing funds from the bank. Keep the cash in a safe place. Withdraw money from your bank in small amounts, well in advance of the end of 1999. In this way, you will avoid long lines at the bank near the end. You should also be aware that computer-controlled electronic tansactions involving ATM cards, credit cards, and the like cannot be processed in certain emergencies.

If you wish to remove very large amounts from your bank account, go to a bank officer and tell him what you are doing. You can mention that the Federal Reserve understands the problem and is printing an additional $50 billion to facilitate such demand.

Tell him that you understand that you must fill out a form in order to arrange for such a larg withdrawal. Be very courteous, but know that it is your money and you have a legal right to withdraw the money. You are breaking no laws by doing so. Smaller bills will be more useful in a time of crisis. A growing number of businesses today will not accept $50 and $100 bills. Several hundred dollars in rolled change could also be useful.

If you live in the country, it is rather easy to store money in jars in the ground outside your home. (Plastic lids cannot be detected by metal detectors.) If you live in the city, you may wish to purchase a safe. A safe is only safe when it contains certain substances which will turn to water if a fire occurs. That will limit the amount of heat buildup possible inside the safe. Then wait a week after the fire is past, before opening the safe. (Otherwise, the papers will burst into flame as soon as you open it.)

Tell no one except your spouse or a close family member about your stored savings.

Frankly, the welfare of the nation is better off if everyone only withdraws a small amount from the bank. But the amount you should withdraw will be an individual decision.

In December 1999, pay all 30-day acocunts by the latter part of the month! Do not wait until January to pay them! If you pay in cash, get receipts. If you pay by check, you would do well to get receipts also.

Have paper records of all types of financial data.

Then there is the stock market. Get out of it! Trouble is coming. There are several reasons why we can expect a depression when the turn of the century comes. Experts advise that you sell all your bonds (including munis [municipal bonds]), and equity mutual funds.

Keep in mind that, if the government shuts down the stock market in a panic, you probably will not get your money back. This would also be true of every electronic promise to pay, including bank accounts. If it is a digital promise, it is a risky promise.

Here is another suggestion: End your automatic deposit of paychecks; have them given to you instead. End automatic utility payments, and instead pay them by check (not cash, so you can prove your payment). Cash your checks at the grocery store or bank, and no longer at automatic teller machines. Carry $60 in

rolled quarters and dimes in your car.

PAYING THE IRS

At the present time, all money electronically transferred to the IRS goes there via a standard 2-digit year field. Yet the IRS has announced that only a 4-digit will be allowable in 1999. There may be problems in the spring of 1999 when, using non-compliant equipment, people try to do that,

POSSIBILITY OF RELOCATION

Be prepared to relocate to a shelter for warmth and protection during a prolonged power outage.

Keep items you would most likely need during an evacuation in an easy-to-carry container. Be prepared to leave. Depending on the situation and the mode of transportation, this might be a large, covered garbage can, a camping backpack, or a duffle bag.

Store this kit in a convenient place known to all family members. Or give one to each member. Keep a smaller version of this Disaster Supply Kit in the trunk of your car. Keep items in air-tight plastic bags.

Be sure to take blankets, sleeping bags, etc., with you.

Plan first, second, and third choice places (homes, relatives, business) where you will go to reunite your family. Select two out-of-state relatives you will call if your family members are separated in a crisis. Have a secret hiding place at each location where you have food and supples and/or can leave a message if you must leave the location. Each family member should carry a copy of this information. Even your small children will have this, so adults can notify you if they become lost.

Give each family member a message beeper. Then have a few practice “emergencies.” Teach each one how to turn off the household gas and electricity, and put out fires with salt, baking soda, water. Hold practice sessions. We put out a dangerous trailer fire by throwing wet towels over the beginning fire.

OTHER PREPARATIONS TO MAKE

Develop a sense of urgency, and pursue that strategy with a vengeance.

Make sure your computers are backed up properly! Have the information on them stored so you can later retrieve it.

Have a battery-operated radio for information about what is happening, where shelters are located. Knowing what is happening locally and in the nation in a crisis would be information you should have. Are riots taking place? Are the banks still open? Is the economy collapsing?

If possible, change your stored drinking water every 6 months, so it stays fresh. Rotate your stored food every 6 months.

Re-think your family needs at least once a year. Replace batteries, update clothes, etc. Ask your physician or pharmacist about storing prescription medications.

Contact your local emergency management of civil defense office and your local American Red Cross chapter. Find out which disasters are most likely to happen in your community. Ask how you would be warned. Find out how to prepare for each.

Meet with your family and discuss the types of disasters that could occur. Explain how to prepare and respond. Discuss what to do if advised to evacuate. Practice what you have discussed.

Plan how your family will stay in contact, if separated by disaster. Pick two meeting places: (1) a location a safe distance from your home, in case of fire, and (2) a place outside your neighborhood, in case you cannot return home. Choose an out-of-state friend as a "check-in-contact" for everyone to call.

Also do this: Post emergency telephone numbers by every phone. Show responsible family members how and when to shut off water, gas, and electicity at the main switches. Install a smoke detector on each level of your home, espeically near bedrooms. Test them monthly and change the batteries twice a year.

Meet with certain neighbors: Plan how you could work together after a disaster. Know their skills (medical, technical). Consider how you could help neighbors who have special needs, such as elderly or disable persons. Make plans for child care in case parents cannot get home.

Remember to practice and maintain your plan.

STILL MORE THINGS TO CONSIDER

Request copies of all your medical records ahead of time.

Save canceled checks (so you can prove you made your pay-

ments).

Do not purchase a home at the end of 1999 or just afterward.

Avoid flying at the turn of the year or for a little while thereafter.

Do not make any phone calls on New Year's Eve. A phone call started just before the end of December 31, 1999, and carried over past midnight, could be billed as 52 million minutes long (60 minutes x 24 hours x 365 days x 99 years).

Try to get out of debt (except for your home mortgage).

If you want to remove cash from banks, do not wait until the end of the year—when everyone else will be doing it! If a run on the banks is made, laws could be quickly passed to shut down the banks.

Pay January 2000 bills early (and be sure you obtain a receipt).

If you have an unused RV or travel trailer in your driveway with a propane stove, fill up the propane tank and hang onto the camper rig.

HOME PROTECTION

In time of local or national crisis, you will need the guardianship of angels. Plead with God for help and protection.

One expert recommend that everyone have a shotgun and rifle for personal protection and hunting wild game in time of crisis, as well as a supply of pepper spray. Another survival expert suggests purchasing 6 wasp and hornet sprays (cheaper than tear gas and as powerful). But the Lord is the best protection you can have.

Some may wish to install dead bolts on outside doors and windows.

SPECIAL CATALOGS

An outstanding catalog is Lehman's Non-Electric Catalog ($3.00). Order a copy today. P.O. Box 321, Kidron, Ohio 44636 (330-857-5757) (Lehmans.com). —All kinds of things are in this catalog! The variety is fabulous. It includes grain mills, cast iron cookware, canning and juicing equipment, heating and cook stoves, refrigerators (propane and diesel), solar power, toilets, washing machines, water pumps and buckets, ram pumps, water heaters, tools, wagons, buggies, and gardening and farming tools and equipment.

Here are more catalogs:

Natural Lifestyle. (800-752-2775) (natural-lifestyle.com).

Campmor, P.O. Box 700-A, Saddle River, New Jersey 07458-0700 (800-226-7667). Camping gear especially.

Richters Herb Catalog, Goodwood, Ontario L0C 1A0 (905-640-6677; fax 905-640-6641) (richters.com).

BARTER ITEMS

Here is something to consider while there is still time to do it. You might wish to acquire some barter items. These are things you can later trade with the neighbors for garden food, etc.

There are five criteria which make a product useful for barter: (1) Not easily made at home. (2) High consumer demand. (3) Durable in storage. (4) Divisible in small quantities. (5) Its authenticity is easily recognizable.

You may not stock up on all of the following, but having a few would be good:

Liquid detergent, laundry detergent, rubbing alcohol, bleach, toothbrushes, razor blades, toilet paper, aluminum foil, writing paper, typing paper, pens, pencils, erasers, shoelaces, string, cord, rope, fishing line, insect repellent, water repellent, paint, varnish, matches, watches, tape, light bulbs, sewing supplies (such as needles, thread, zippers, buttons) aspirin, vitamins, seeds, grain, sugar, burn ointments, safety pins, manual can opener, knives, canning jars, lids, rings, socks, underwear, winter clothes, coats, blankets, quarts of multi-viscosity motor oil, anti-freeze, wire, glues, bolts, screws, and/or nails.

AND MORE THINGS TO CONSIDER

Every time you shop, purchase double or triple amounts. Stock up. You may be able to help others when the crisis comes. Remember Joseph in Egypt. He helped his family when they had their "Y2K" crisis.

Find alternate methods of doing things.

Eliminate non-essentials from your life. Eliminate all those time wasters and money wasters and extra belongings you do not need. Get rid of your television set.

Simplify your lifestyle. Learn to say no to things or activities which do not make you self-sufficient.

Begin treating things as though they were not replaceable. Figure out how to do without. Buy things that will last. Obtain equipment which does not need electricity.

Always have more than one way to do something.

Organize your life. If you live in a disordered manner, it will cause you grief later on.

Eliminate distractions from your life. Be God-centered. He should be first, last, and best in all your plans and activities.

Believe that, with God's help, you can do it; then go ahead and tackle the job. Toughen up. Learn to get in and work, and carry it through to success.

Do not be spread too thin in your daily life. Take time with God and with others. Only certain things in life really matter.

Train your family to be guarded. Teach your children to not give information to a stranger. Be prepared for trouble ahead.

Get rid of things you do not use or need.

What items do you use daily that must be replaced by a third party? Could you make them in a pinch? If you could not, do you have spares?

Your first big mistake would be failure to prepare. Your second big mistake would be to rely on those preparations. Seek God for the help you need! He alone can guide and care for you through the coming crisis—and all the others.

Begin immediately. Start preparing!

Begin incrementally. Start preparing little by little. Every week add to your preparation.

Work with others. Some are better on water, others on electricity. Working together, you will accomplish more.

APPENDIX 1: PREPARATION TIME LINE

This is a very brief sprinkling of points discussed in the preceding pages, but it will help you see the forest from the trees:

It is Spring 1999. Rededicate your life to God. You only have a little time left. Death comes quickly to all of us.

If you have not moved out of the city yet, look for a place in the country to move to.

Select your garden area. Collect soil samples and send them off for testing.

Haul in manure so it can rot, later to be used on the garden.

Apply the recommended amount of lime, to make the soil a little more alkaline. Rely on the manure, leaf mold, etc., to supply the nitrogen, phosphorus, and potash.

Order some of the catalogs listed here; ask friends about other

sources. We have listed only a few.

Go through this book and underline in black everything you need to stock up on. Start doing so.

Go through the book again and underline in red all the equipment you could get. Circle those items you want to order. Start doing so.

Review all your financial assets. Begin getting out of stocks and bonds. Gradually, week by week, withdraw more savings from the bank. Pay your debts.

Get rid of all your excess baggage.

Begin installation of the various equipment you are getting. Test it out.

Install the special electrical circuit, for your generator backup electrical system.

Following a family pre-announcement, turn off the electricity for one day that you and others in your family will be at home all day. Proceed with a variety of regular duties. Try include washing some clothes and drying them. What could you not do? Did you need to? What other preparations yet need to be made?

If you have small ones, decide whether you will stock up on boxes of diapers or will return to the old-fashioned method. Try it for a day and you will know what will work best for you.

Turn off the water another day. Better yet, turn it off the same day you turn off the electricity. —Because that is what is likely to happen later.

Turn off the propane on another day, and see how well you do.

Go back to the drawing board, and list other things to be done.

Set to work doing them.

By this time, it should be late spring. Plant your garden, and learn from your mistakes. What went wrong? How could you have done better?

It is now late summer, and time to plant your kale. Plant a lot of it, enough for your family and nearby friends.

Harvest the last of your crops, including the Hubbard squash. Spread it out, one layer high, on newspapers in a room which will stay dry and cool, but will not freeze. You can harvest and cook it throughout the winter as a fresh, starchy food.

September is now nearing its end, and you have ordered nearly all your equipment and supplies. You will try to obtain more, but may have a much more difficult time doing so.

By this time, you have sold your stocks and bonds, and pulled

all the money out of the bank which you intended to remove. Before the end of the year, serious runs on the bank will occur.

By this time, you have obtained copies of all your legal, medical, and personal records. Those papers are all organized in large envelopes in one place, preferably a box of some kind.

By this time, you have your equipment and fuel storage facilities, and they are full of fuel. From this point onward, there are several more things to be done:

Finalize on obtaining receipts for every purchase, etc., and obtaining the latest copies of your financial records (bank statements, credit card account status, home mortgage papers, etc.).

At some point in the last two months of the year, vaccum and clean your house thoroughly. Also thoroughly clean around your home. You may not easily be able to do so later for quite some time. If there are extra things to be washed or dry-cleaned, do it now.

Listen to the hourly news on the radio. If you have shortwave or web, you also use it to keep in contact with what is taking place elsewhere in America and overseas.

Gas up the car frequently, keeping it full.

At the end of the year (Friday, December 31, 1999 to Monday, January 3, 2000), you go nowhere! Instead, stay home, pray for God's blessing on those who need it, and be aware of what is happening in the world.

The new year begins.

In Part One of this book I have listed everything I can think of which might help you in the days ahead. Your heavenly Father will provide you with even better wisdom as to what needs to be done, as you seek Him in prayer.

APPENDIX 2: VOLTAGE REFERENCE GUIDE

Actual running watts may vary. Refer to your owner's manual for actual wattage. On the left, below, is listed the appliance or machine, and on the right is the *running watts*. (That is not the *starting watts*! Allow 3 times the listed watts for starting devices which have motors.)

Air Conditioner (12,000 BTU)	1700
Battery Charger (20 amp)	500

Belt Sander (3-in.)	1000
Chain Saw	1200
Circular Saw (6½ in.)	600-1000
Coffee Maker	1000
Compressor (1 HP)	2000
Compressor (¾ HP)	1800
Compressor (½ HP)	1400
Curling Iron	700
Deep Freeze	500
Disc Sander (9 in.)	1200
Edge Trimmer	500
Electric Nail Gun	1200
Electric Range (I element)	1500
Electric Skillet	1250
Furnace Fan (1/3 UP)	1200
Hair Dryer	1200
Hand Drill (1 in.)	1100
Hedge Trimmer	450
Lawn Mower	12000
Light Bulb	100
Microwave Oven	700-1000
Milk Cooler	1100
Oil Burner on Furnace	300
Oil Fired Space Heater (140,000 BTU)	400
Oil Fired Space Heater (85,00 BTU)	225
Paint Sprayer, Airless (1/3 HP)	600
Paint Sprayer, Airless (hand-held)	150
Radio	50-250
Refrigerator	600
Slow Cooker	200
Submersible Pump (1½ HP)	2800
Submersible Pump (1 HP)	2000
Saw Pump	600
Table Saw (10")	1750-2000
Television	200-500
Weed Trimmer	500

Allow 3 times the listed watts for starting these devises.

— PART 2 —

A closer look at Y2K and how dangerous it might be

FACTS YOU SHOULD BE AWARE OF

There are facts you should be aware of—and those facts are astounding.

Considering the entire situation, the four most serious problems will be these:

1 - An electric power grid failure. This appears to be inevitable, and when it goes down, it will result in a crisis in transportation, food supply, shipping for businesses and commerce, water supplies, and dozens of other areas.

2 - Lack of government preparedness. There will be no retirement checks, defense system, and dozens of other areas of government operation.

3 - The collapse of the U.S. stock market. The 1929 fall resulted in economic hovac for the entire world.

3 - Extreme lack of preparedness by foreign governments and businesses. This alone could produce a worldwide depression. It could also lead to war.

4 - The very real danger of riots and a consequent U.S. government takeover.

Maybe you do not want to read any further.

— INTRODUCTION —

Friday evening, December 31, 1999, will be the night to be dreaded. Many businessmen will go to bed with a heavy heart, some with thoughts of financial terror.

At 12 midnight on January 1, 2000, large numbers of the world's main frame computers will either begin feeding out gibberish or will shut down entirely.

You and I have heard about this "Y2K" problem for several years now. I have recently checked into it—and it really does exist. Perhaps some of the problems will be fixed in time, but it is now certain that a sizeable number will not.

Here is how one individual describes the situation:

"**We've got a problem. It may be the biggest problem that the modern world has ever faced.** I think it is . . Tens of millions—possibly hundreds of millions—of pre-programmed computer chips will begin to shut down the systems they automatically control. This will create a nightmare for every area of life, every region of the industrialized world.

"**It's called the year 2000 problem. It's also called the millennium bug, Y2K, and millennium time bomb.**"—*Gary North, "The Year 2000 Problem: The Year the Earth Stands Still," in "Y2K" Links and Forums.*

"Y2K" is short for "Year 2000." The Y2K problem seems too fantastic to seem true, so this report will primarily consist of quotations from authorities who are experts in their fields.

As this is written, there is in hand **a 17-page report by one of the leading financial houses in New York City: *J.P. Morgan Securities, Inc.*** It is devastating. Listen to this; it was written in the summer 1997:

"**We believe the Year 2000 problem will be the single most significant event in the information technology services industry over the next few years and will likely have a lasting effect on the industry into the next millennium** . .

"Awareness has grown significantly, but action [to solve the problem] has been slow. Refusing to believe that cost estimates for complying with Year 2000 requirements can really be so huge, **many corporate executives seem to be in a state of denial.** But guess what? **The true costs will almost certainly be even higher than current estimates, and that's not even the worst news!**

"It is becoming clear that the cost of satisfying Year 2000 re-

quirements will be significantly larger than anyone thought, with some companies spending hundreds of millions of dollars. These expenses will be a major influence on shaping corporate budgets (and not just technology budgets) for the next several years.

"Cost is not the largest problem, however—**time and people are the scarcest resources.** Compliance will represent a reasonably close call for everyone, but corporate and governmental entities not yet currently mobilized and actively working on the problem are already in deep trouble.

"We expect triage will be the key during most of 1997, as corporate executives organize resources to address their top-priority problems and seek expedient methods of addressing less critical ones. Options include replacing, repairing, or retiring (including outsourcing) systems and businesses that are noncompliant.

"**Governments worldwide and international corporations appear to be even further behind than U.S. companies.** Despite an aggressive schedule laid out by the Office of Management and Budget, **the U.S. Federal Government has made little progress in actually addressing the problem.**

"Meanwhile, **the European Community** is proceeding on its merry way in moving to a single currency (the *euro*), **seemingly unaware** of the additional formidable systems challenges."—*William D. Rabin and Terrence P. Tierney, J.P. Morgan Securities, Inc. Equity Research Department, "Industry Analysis: The Year 2000 Problem," May 15, 1997, New York.*

Yes, the Y2K crisis is real and, as this is written, it is less than a year and a half away. Consider this: Chase Manhattan Bank said in a routine filing that **it planned to spend $250 million on the problem over the next three years, to fix its 200 million lines of code (200 million for that one company alone!).** That business organization is not alone: AMR (parent of American Airlines), Hughes electronics, and a number of other leading firms have announced they plan to each spend over $100 million to fix the problem in their companies. **But the experts consistently predict that these estimates are far less than what the actual costs will be.**

Visa and Mastercard have asked member banks to hold off issuing cards that expire in 2000 or beyond because some of the transaction processing systems cannot handle them. **Both groups have threatened to fine banks that are not Year 2000 compliant. The situation is expected to get worse.**

Coopers and Lybrand estimates that **an average-sized company with 8,000 uncorrected programs—or 12 million**

lines of code—would have to change the data reference in one out of every 50 lines. To greatly add to the problem, they declare that virtually every line of code will have to be tested.

Dr. Edward Yardeni, a financial consultant to the top firms in America, has prepared a 21-page report which we have. He is chief economist at Deutsche Morgan Grenfell. His report was written this month (June 10, 1998). Here is the opening paragraph:

"**The Year 2000 Problem (Y2K) is a very serious threat to the U.S. economy. Indeed, it is bound to disrupt the entire global economy. If the disruptions are significant and widespread, then a global recession is possible. Currently, I believe there is a 60% chance of such a worldwide recession**, which could last at least 12 months starting in January 2000 and could be at least as severe as the 1973-1974 global recession. That downturn was caused by the OPEC oil crisis, which is a useful analogy for thinking about the potential economic consequences of Y2K. Just as oil is a vital resource for our global economy, so is information. If the supply information is disrupted, many economic activities will be impaired, if not entirely halted."—*Dr. Edward Yardeni, Year 2000 Recession? Monograph.*

Yardeni then goes on to explain in some detail how he gradually moved his 1997 estimate of a 30% likelihood of recession—up to 60% in mid-1998, after studying various business and government reports. He concludes his careful assessment with these words:

"OMB [the U.S. Office of Management and Budget] released its fourth progress report on March 10, 1998, for the three-month period ended February 15, 1998. **After studying it very carefully, I concluded that there is an increasing chance that vital government services will be delayed, disrupted, impaired, and curtailed in 2000. This precarious situation implies that foreign governments, as well as many business organizations around the world may fail to meet the deadline too.**

"Therefore, I raised the odds of a severe global recession to 60% on March 16, 1998 . .

"The recession could begin before January 1, 2000, perhaps during the second half of 1999, if the public becomes alarmed and takes precautions. If stock prices fall sharply in 1999, in anticipation of a recession in 2000, the resulting loss in confidence could cause consumers to retrench in 1999 [stop making unnecessary purchases, as well as sell their stock] and trigger a recession sooner as well. **It could start in 1999 if bankers cause a credit crunch by**

refusing to lend to companies that are most at risk of failing in 2000. If these companies are not bailed out by their key vendors or customers, they might start failing next year."—*Ibid.*

As source for the concluding two sentences in the above paragraph, Yardeni cites an article in a leading banking journal *(Jay Golter and Paloma Hawry, "What Every Loan Officer Needs to Know about the Year 2000 Computer, But Doesn't Know How to Ask," in FDIC Banking Review, March 1998).*

If such experts as these believe that an economic crisis is looming, who are we to question it? Read this:

"Edward Goldberg, executive vice president of operations, services and technology for Merrill Lynch, warned in mid-April 1998, that his company "just won't do business" with any other broker or vendor that doesn't pass industrywide Y2K testing that began during the summer of 1998. His comment, reported by Reuters (April 15, 1998), suggests that **Y2K-compliant companies may start to join together in Y2K fortresses and shut out businesses that are not expected to be ready for the century date change. Such a fortressing trend could very well cause a recession in 1999 if the Y2K barbarians are left to die outside the fortress wall.**"—*Ibid.*

On June 19, 1998, Dick Millers, an economist, wrote this:

"I base this curve on deJager's prediction that **companies must start Y2K remediation by 1997-11-07 [November 7, 1997] at the latest to have any hope of fixing their critical systems.** If they started a year earlier than that, they could fix both the critical and noncritical ones. I presume that even noncritical systems are there for business reasons and that, if they are not fixed, it will have a negative effect on earnings. **Since January 1997 is the last possible moment to start and fix everything, there is trouble ahead** . .

"The costs of fixing and testing old software may well exceed the costs of replacements, **if only time was available**. Further, if the Y2K effort [by an organization] is doomed to fail anyhow, then last minute spending just helps deceive investors and creditors into false optimism longer, and may push the time of liquidation sales into a buyer's market period."—*Dick Mills, "Schedule of Y2K Remediation: a Statistical Approach."*

Gary North says it this way:

"**Everything is tied together by computers. If the computers go down or can no longer be trusted, everything falls apart.** And it matters not a whit to the computers whether we accept this fact or not. They do what they've been programmed to do. **They've been programmed to recognize 2000 as 1900.** (**Uncorrected PC archi-**

tecture DOS and Windows-based desktop computers will revert back either to 1980 or 1984. They can be corrected briefly; but, as soon as a PC is turned off, the correction dies. It will reboot to 1980 or 1984.)"—*Gary North, "The Year 2000 Problem."*

The current Microsoft Windows operating systems will function correctly when the century changes. However, **many, programs written for Windows are Y2K defective. Your accounting package may be no good in a year and a half.**

Can the Y2K problem really be so bad? Here is a simplified explanation, by **Jay Golter and Paloma Hawry. Golter is a financial analyst in the Federal Deposit Insurance Corporation's Division of Research and Statistics. Hawry is a manager at the Actoras Consulting Group in Schaumburg, IL.** The article in *FDIC Banking Review,* quoted earlier, was later expanded into a 27-page analysis, a copy of which I have. Consider this:

"Early computer programmers worked around a variety of constraints imposed by the emerging technology. Two of the biggest constraints were the usable memory of the machines and the costs of storing data.

"One technique used to circumvent these limitations was to represent dates with an implied century. For example, a date field holding the value "01/01/56" meant "January 1, 1956" not "1856" or "2056." Use of this convention reduced the amount of storage required and improved processing speeds. For the few applications in which valid dates could span a century (for example, birth dates for the general population in which some people are 1 year old and others may be 101 years old), the specific date fields would be expanded accordingly . . **The technique of representing years with two digits was also used when the microchips that are embedded in many kinds of machinery and equipment were hard-coded.** Other programming shortcuts, as well, were applied to dates in ways that can create problems by the end of the century."—*Jay Golter and Paloma Hawry, "Circles of Risk."*

Here is the picture, from another standpoint:

"The bug at the center of the Year 2000 mess is fairly simple. **In what's proving to be a ludicrously shortsighted shortcut, many system programmers set aside only two digits to denote the year in dates**, as in 06/15/98 rather than 06/15/1998. Trouble is, when the computer's clock strikes 2000, the math can get screwy. Date-based equations like 98 - [minus] 97 = 1 become 00 - 97 = -97. That can prompt some computers to do the wrong thing and stop others from doing anything at all."—*Time, June 15, 1998.*

These dates were used for the beginning, intermediary and terminal dates, as well as time span periods—for government, businesses, and all kinds of equipment. Here is but one example of what can happen:

"**A system that orders replacements for a particular part every five years might record that a part was last installed on June 1, 1992.** On June 1, 1997, the system would calculate that "97/06/01" - "92/06/01" represented five years and that the part needed replacing. In the year 2000 however, the system might conclude that the part was -97 years old ("00/01/01" - "97/06/01" equals -97 years). **How the computer would then proceed would depend on how the programming instructions had been written.** Some systems might recognize the calculated age as invalid, and generate a report listing such occurrences for further investigation. Other systems might leave the replacement parts unordered, since they would never have reached a calculated age of five years. In the second case, the part would eventually wear out and fail. **Depending on the function of the part and the machinery it belonged to, this failure could result in the production of defective merchandise, significant downtime while the defective part was identified and a replacement was ordered and installed, or, in the worst case, serious injury or loss of life** if the part was essential to the safe operation of the equipment."—*Golter and Hawry, Circles of Risk.*

We might wonder how foolish those people were back there, that they did this. Did they not realize a terrible crisis would occur at the end of the century as a result of their dating abbreviation? All they left out was "19"; yet, what a terrible problem the civilized world now faces because of it. **Golter and Hawry tell us that, 20 and 30 years ago, the programmers and their managers knew that changes would have to be made—but they assumed later programmers would do so. Instead, everyone remained in the "omit 19" rut—into the 1990s!**

"To the extent that the eventual consequences of using date shortcuts were contemplated during the 1960s and the 1970s, it was believed that the underlying programs would be replaced well before the century changed and that if they were not, there would be plenty of time to correct the problem. Unfortunately, this attitude endured long enough so that **some software written even as late as the 1990s contains the same date problems, and some equipment being sold today will malfunction in the next couple of years.** But with the century now drawing to a close, the time left in which to correct this problem is rapidly shrinking."—*Time, June 15, 1998.*

Well, what is involved in solving the problem; that is, getting the computer programs operating correctly? One alternative is slow, painstaking work modifying every program; the other is to discard the faulty programs and start over again. **But throwing out the bad programs would mean disaster on an even greater scale. So much information, of every possible kind, is already stored—and keyed to the older, faulty programs.**

So what does the slow, painstaking correctional route involve? Hard work, over a number of years, by a small army of expensive programmers. **The problem here is that many firms did not start soon enough to clean up their programs; every line has to be checked and tested. The testing part alone is time consuming; and, last but not least, there are not enough programmers available to do the job!**

> "In most cases, modifying any part of a program that has date problems is not especially difficult. **What is difficult and what makes Year 2000 remediation programs especially challenging and time-consuming is the need to (1) find all of the places where date problems might lead a program to miscalculate or terminate; (2) coordinate the repair of each part of the overall system so that no one repair interferes with the operations of the other parts of the system; (3) test the repair by using data that accurately mimics the other parts of the system**, and (4) complete the project without granting any time extensions."—*Time, June 15, 1998.*

The cost of doing this will be fabulous!

> "Scanning for date logic, modifying code, and, especially, testing the revisions as units and as parts of an integrated system, as needed to bring a large scale system into date compliance is time-consuming and therefore expensive. **The estimate used by many firms to budget for the conversion project has been $1.00 per line of code. But, as the shortage of programmers qualified to work on the problem intensifies, remediation costs will rise.**"—*Ibid.*

Multiply one dollar per line of code by all the lines of code which need to be corrected. It is estimated that there are not millions, but billions of lines of code which need checking, correction, and testing!

But, even if all that were done—because there was enough time, money, and programmers to do it,—Golter and Paloma Hawry declare that problems would still result. As but one example, they cite the fact that **much of the modern equipment in the home, office, factory, or on the train, airplane, etc., contains "imbedded" computer chips. The equipment will**

not operate properly without them, yet it may be too difficult to replace the chips in all that equipment! In many cases, the chips are imbedded too solidly to be changed.

But, not only must there be enough time, money, and programmers to do the job,—there must also be the incentive. **Oddly enough, many firms have been remarkably slow to start doing anything about the problem. The top-level managers, who have to make such expensive decisions, know they will retire soon—and they want to keep their stockholders happy with the profits coming in** while they are in charge. (They are rewarded handsomely with big salaries for doing so.)

> "Our first response when we hear this news is denial. Most people stay in denial, including the business managers whose companies are totally vulnerable to computer failure. This is why the problem will not be fixed. Everyone in authority will deny that time has run out to get this fixed, right up until December 31, 1999. They are paid to deny this."—*Gary North, "The Year 2000 Problem."*

North is somewhat extravagant in his gloom and doom pronouncements, yet there is truth in his analysis. **Because of this "peace in our time" attitude, many firms started trying to solve the problem just a little too late. As a result, to one extent or another, they may be caught in the January 2000 business crisis.**

> "There are grim reports that corporate America isn't taking the Y2K task seriously enough, a danger that will be highlighted this week at Senate subcommittee hearings. **The Senators will be told that an examination of recent Securities and Exchange Commission filings found that 60% of the U.S.'s biggest companies had not completed the first step of assessing whether their systems are ready for the new century—much less begun fixing the problems.** "That's a disturbing percentage at this late date," says Steven Hock, president of Triaxsys Research, which studied the SEC filings."—*Time, June 15, 1998.*

— CIRCLES OF RISK —

The 27-page *"Circles of Risk,"* by Golter and Hawry, is one of the most exhaustive analyses of the problem and how it will affect the nation and the world. **Let us briefly summarize these six ever-widening circles:**

The first circle consists of core information systems. This

would be the software which runs the computers. Functions likely to be automated (and thus subject to Y2K problems) would include payroll and benefit administration, inventory management, accounting, accounts payable and receivable processing, scheduling of staff, production, deliveries, or repair.

To date, most of the Y2K correctional work has been in this field. As mentioned earlier, each line of code must be checked, modified when necessary, tested, and replaced as needed. Every important component of the systems must be checked.

But the firm may also be relying on the giant computers, called "mainframes" (which they either own or lease space on).

> "In some cases, the hardware on which important applications run will itself be unable to process data after the 20th century. For example, IBM has announced that it will not provide upgrades to system 360 mainframes (1970 technology). Some of these platforms may still be in operation at firms that were unsuccessful in converting to newer equipment. **Replacing a mainframe platform is rarely an easy proposition because some of the software running on the old system may be incompatible with the new system**, requiring that new application software be purchased or created. "—*Golter and Hawry, "Circles of Risk."*

There are very serious problems involved in upgrading older mainframes, because updating the computer language in them will involve very serious hurdles which are too technical to discuss here.

Many COTS (commercial off the shelf software), which is now for sale in computer stores, contains the same "omit 19" as did all the older programming! Beware! You may have a problem in your own computer! Year 2000 patches or upgrades for many COTS applications have not yet been released. The difficulty of testing and installing will increase with the number of modifications that the in-house staff has developed.

The second circle of risk involves networks, workstations, and PCs. This includes e-mail and functions which enable files to be electronically shared in-house.

The third circle consists of third-party data exchanges, in which businesses exchange a lot of information with other offices or firms elsewhere. Examples of this would include filing reports with the IRS, ordering or receiving credit reports, ACH transactions, and cash management reports.

A significant problem here involves programs in someone else's computer, which you "data exchange" to, which are not "compliant"; that is, have not been updated to function correctly after the year 2000 begins. Their lack of updating can cause you serious problems.

"Even if only a small percentage fail, the resulting disruptions are bound to cause some trouble, and worse if the minority of non-compliant Y2K systems have an adverse Domino Effect on compliant ones . .

"**In other words, the sum total of all interdependent computer systems must all be compliant.** *The network is the computer.* A problem is one system could trigger a Domino effect, which poses a great risk to all who fail to test whether their local compliant system is compatible with their global network. **The networks that must function perfectly—at the risk of partial or even total failure include: (1) electrical power systems, (2) telecommunications, (3) transportation, (4) manufacturing, (5) retail and wholesale distribution, (6) finance and banking, (7) government services and administration (including taxation), (8) military defense, and (9) international trade.**"—*Dr. Edward Yardini, "Year 2000 Recession?"*

The fourth circle of risk involves plant facilities and equipment. As mentioned earlier, this would include pieces of equipment, including telephone switchboards, security systems, etc. Some manufacturing processes rely on **control systems that receive time-stamped data from sensors, which analyze elapsed time and send a message to do something at a certain time. This type of computer procedure is used in millions of units in the Western world. In much of it, the "19" is missing.**

"**To determine in advance which machinery will be impaired, an organization has to know how the machinery was designed**, and what the specifications of the embedded microprocessors are. **However, many organizations are having great difficulty uncovering this important information.**"—*Ibid.*

The potential problems here involve not only industry, transportation, communication, and government, but also various types of health care.

"The potential failure of embedded microprocessors could expose some organizations to even greater risks than those they face if data-processing systems malfunction. For example, **much of the equipment used in a hospital, including patient monitors, automatic drug-dosing devices, MRI and CAT scan equipment may rely on embedded technology. Failure of equipment could result**

in serious injury or death. But hospitals are not the only firms that may face great risks from the failures of equipment. For example, in Bhopal, India, in December 1994, an estimated 6,000 people died when a valve in a Union Carbide Chemical factory malfunctioned. **Many plants that use or produce similarly dangerous chemicals rely on "smart technology" to monitor and control the process, and some of these may be vulnerable to Year 2000 malfunctions.**"—*Golter and Hawry, "Circles of Risk."*

There are billions of microchip systems embedded in all kinds of appliances, equipment, security systems, processing and manufacturing plants, medical devices, and numerous other vital applications. It will be interesting to see what happens in a year and a half.

The fifth circle of risk involves business partners. Many business firms closely interact with others. In addition, many organizations are dependent on third parties which provide services, such as maintenance, telecommunications, electricity, water, etc. A flaw in the computers of one would seriously injure the others. All the computers must work right at the change of the millennium or everyone involved will suffer. **"Just-in-time inventory" systems rely heavily on ordering and receiving a few parts to build or ship out a product. The Y2K problem will seriously affect such operations.**

The sixth circle of risk involves general economic repercussions to the nation and the world.

Capers Jones, in his study, *"The Global Economic Impact of the Year 2000 Software Problem,"* estimated that 1% of large firms will go bankrupt as a result of the crisis. Regarding mid-size firms, we are told:

"There are about 30,000 companies in the mid-size range [which have 1,000 to 10,000 employees] in the United States, and a 5% to 7% business failure rate would mean that **from 1,500 to about 2,100 companies might close or file for bankruptcy as a result of the year 2000 problem.** This is a significant problem and it is an open question as to whether the impact of the year 2000 problem is severe enough to trigger a recession."—*Ibid.*

In addition, **we should not forget government services, such as traffic lights, subway systems, etc.** But we will save comment on local, state, and federal government preparedness till later in this report.

Yardeni advises that **those firms in recent years which have**

merged to form still larger corporations could be especially hard-hit by Y2K. There are so many problems attendant in merging large companies, that the new entity is far less likely to have made the changes needed for December 31, 1999.

— CASE STUDIES —

WATERTOWN, NEW YORK

Case study: Watertown, New York.

Charles E. St. James described what happened to his family, in a letter to Don McAlvany:

"On Janaury 7, 1998, Watertown, New York experienced a devastating ice storm. We lost our power on January 8, at approximately 8:30 a.m. With our home being all electiric, this meant no heat, water or lights. Initially, we thought we would only be without power for a couple days, but days turned into weeks—three weeks to be exact.

"Fortunately, we had a wood stove, so were were able to keep plenty warm and do all our cooking on top of the stove. As for drinking water, we had filled a few 2 liter bottles of water the night before, but this would only last a couple of days. Our neighbors had a pool, which rovided us with water to flush the toilet and bathe, but only after chiseling thorugh about 6 inches of ice on the surface of the pool.

"Candles and oil lamps provided our light. Our only link to the outside wrold was a protable radio for those homes which had batteries! Our phone lines were also downand little did we know at the time that they would be down for about a month. Families weren't able to get through to see if their relatives were all right, which caused a lot of anxiety.

"Our refrigerator only kept the food cool for a few days, and then we had to become resourceful and find ways to try to save whatever food we had. We gathered ice from the outdoors and put it in coolers.

"No travel was allowed during the first few days, becuae three were too manypower lines and trees down, which made it just too dangerous. Unitl the driving ban was lifted, we had to make do with what supplies we had on hand. Neightbors looked in on ech

other and shared whatever they had. We had plenty of wood, as we had bought for the whole season, but our neighbors wer coming to us for wood, which depleted our household supply. If this crisis had gone on long enough, we whould have been without wood for heat also.

"As the days turned into weeks, supplies were getting low. Once the driving ban was lifted we were able to venture into the city and seek out stores which were open. Those that were, only allowed a few people in at a time with a flashlight. This was no easy task, as the lines were long and stores were also running low on batteries, candles, kerosene, etc. For they were unable to get shipments in.

" Trucks from other states were bringing in supplies by then there was the problem of price gouging! Money was also running low in many households because banks were not open and there were no ATMs.

"People were unable to go to work so therefore lost wages. We personally own our buiness and were not able to open. When we did, most of customers were staying with families out of the area and therefore, we lost a lot of our business. A 5 o'clock (p.m.) curfew was also put into effect so that the work crew could work on restoring the power as well as to prevent looting. Anyone found walking on the streets or driving their cars were ticketed.

"Many people who were not as fortunate as we were to own a woodstove or other source of heat were forced to leave their homes and go into shelters. This caused a lot of anxiety because most people don't want to have to leave their homes if at all possible.

"After a week of having no power, we resorted to a generator (which is what a lot of people were doing), but the supply just couldn't meet the demand [and] so it took awhile to find one. Many people had theirs stolen from their yard as they had to be installed outside because of fumes, so those of us who had generators had to take caution to safe guard them. Lesson: The unprepared will plunder and steal from the unprepared in a crisis. So, as much as possible, keep your preparations very private, except with family and close friends!

"One would think that during times like this, more people would turn to the Lord in prayer. Many did, however, most people felt they were in control and thought praying to the Lord was foolishness. One lesson we learned was to be prepared for such disasters!"—*Charles E. St. James, quoted in Don McAlvany, News-*

letter.

OTHER EXAMPLES

The above story is about a local crisis, but where would those people have gone—if the crisis had been nationwide?

A power failure threw downtown Auckland into a four-month crisis. It is New Zealand's largest city.

Then there is the 1992 riot in Los Angeles. Aside from being killed, the main problem was food. Most familieds did not have enough food to get through a weekend. Grocery stores were looted, closed, or burned. The same with fast-foods and restaurants.

Keep in mind Indonesia, where rioting caused by the financial crisis, triggered a run on grocery stores—which had their shelves stripped. Many were then burned.

Where there is a breakdown of supplies, the very fragile, just-in-time food delivery system goes down quickly.

U.S. AIR DEFENSE CRISES

WHEN COMPUTERS GIVE WRONG SIGNALS

It can be dangerous when computer chips fail at the turn of the millennium. It could start a war.

In 1980, **a computer-chip failure** at Norad—the U.S. command post in Colorado for assessing nuclear attacks—generated a false alarm of an all-out Soviet missile attack.

As recently as 1995, an American research rocket sent up off the coast of Norway to study the aurora borealis **triggered Russian computer chips**—and so alarmed the Russians that, for the first time in their history, they activated the nuclear suitcase that accompanies the president. See Brian Hall, *"Overkill Is Not Dead," The New York Times, March 15, 1998.* The article suggests that, despite the end of the Cold War, the United States and Russia still have missiles aimed at each other, and can instantly retarget those that do not have a current forwarding address.

— U.S. SENATE HEARINGS —

THE U.S. SENATE HEARINGS

On June 12, 1998, the *U.S. Senate Committee on the Y2K Problem* began the first of its hearings on threats to the electrical power grid and other areas of the economy. Because they considered a power grid failure to be the most dangerous, they began consideration of that topic.

They quickly discovered that the industry was not prepared for what was coming. A survey which chairman Robert Bennett (R-Utah) sent to 10 of the nation's largest electric, oil and gas utilities revealed this. Eight of the 10 had not even finsiehd assessing their automatied systems, which was a first step toward tackling the problem.

Bennett later warned that intensive Senate investigations revealed that there was a strong likelihood the U.S. power grid would collapse at the turn of the century.

Senator Christopher Dodd (D-Conn), committee vice-chairman, was as pessimistic as Bennett. He said may government and business leaders had not even drafted contingency plans; that is, what they would do if an emergency occurred.

It was determined that about 6,000 power plants [actually 7800] are at risk. Included here are a half-million miles of high-voltage power lines and about 112,000 substations. All of these depend on built-in, preprogrammed microporcessors, also called embedded chips. Many of them contain the Y2K problem.

On Tuesday, March 10, 1999, this Senate Committee released its report.

> "The report's conclusions are startling, even going so far as to urge Americans to stockpile at least small amounts of food and water to protect against expected brownouts. People are also advised to save all their financial statmeents. In a draft copy of the report obtained by *U.S. News,* committee chairmen **Robert Bennett and Christopher Dodd predict that the breakdown of computer networks unable to process 21st-century dates will 'one of the most serious and potentially devastating events this nation has ever encountered.**"—*"It's Official: The Millennial Bug Is Really, Truly Scary," U.S. News and World Report, March 8, 1999.*

COMPUTER CHIPS

The Institution of Electrical Engineers defines an embedded system as "a device ued to control, monitor or assist the operation of equipment, machinery or even an entire plant." Embedded systems are powered by microchips that contain permanently coded

instructions.

What about those little chips? They are in virtually all electronic devices in controllers and perform almost limitless tasks. They are in safety and security systems in conventional power plants, water treatment plants, elevators, nuclear power plants, VCRs, fire engines, ballistic missiles, etc. They verify maintenance at regular intervals, issue safety warnings, and stop and start operating functions. They control telephone switches, alarms, sprinkler systems. They trigger solenoids to open and close gates, valves, automatic door locks, railway switches, etc.

Many are not date sensitive; yet, because there are billions of them in operation, massive numbers are almost impossible to locate. How many would have to fail in our railways, jetliners, elevators, traffic systems, factories, electrical grids, ships, and nuclear power plants—before we would be in a state of chaos?

A key problem here is that, when computer experts put a computer system together, they include standard computer chips—many of which were designed 10 or 20 years earlier. In addition, many of these standard computer chips are date sensitive, even though the equipment may not require dating awareness.

Add to this the fact that it is extremely difficult and time-consuming to check all these computer chips. There are literally billions of them in business and industry.

Because of this, a large amount of equipment which could go crazy at the turn of the century.

Here is how Dr. Mark Frautschi, a former Johns Hopkins Univeristy physicist who is a Y2K consultant, described the problem:

> "Most chips are made in bulk and are not custom designed for that one task. A company making timers, for instance, will likely decide to develop a 'one size fits all chips' or the 'mother of all chips.'
>
> "Most likely, Frautschi says, 'that chip will have a date-sensitive area in the background in case some customer needed that function. That date-sensitive area remains on the chip even when it is purchased by customers who have no desire to track dates. The logic: 'It does not need to keep dates; therefore it does not keep dates,' is not based on what is actually happening within the chip.
>
> " 'In one example, a business tested three of its elevators, each controlled with the same type of timing chip from the same com-

pany,' another went to the top floor and stayed while the other went to the basement (slowly) and closed down.

"How many of these systems are out there? Estimates vary widely. One expert told the Nes 5 billion chips were shipped last year while another saad the real figure was 600 billion.

"This discrepancy underscores the simple truth—chips are everywhere: VCRs, microwave ovens, televisions, automatic transmissions, electric utility grids, jet aircraft and military weapons."—*Mark Frautschi, Ph.D., Rocky Mountain News, August 3, 1998.*

"Crawling among pipes and valves n manufacturing plants around the world, technicians wearing radio headsets are relaying to companions carrying portable computers the locations of digital timebombs [embedded computer chips] ready to go off on the Ultimate Midnight on December 31, 1999. A massive hunt is on for the millions of computerized devices, machine tools, measure instruments, computerized valves, and myriad other types of production equipment whose software is tainted with the infamous abbreviation 'OO'."—*Fortune magazine, April 1998.*

"If something went wrong with our business software, that's nohting potentially catastrophic compared with what would happen if our embedded systems went out."—*Pete Valdellon, Y2K coordinator for the Kissimmee Utilities Baord, in Orlando (Florida) Sentinal, April 25, 1998.*

Another problem which our power plants and manufacturing firms face is that computer chips go out of production. Many chips now installed in equipment—is no longer made.No one knows what is inside those chips, or what it would take to replace them.

There are over 30 billion computer chips in use worldwide, and an estimated 5-10% are date-sensitive or non-Y2K compliant. The problem is which is all right and which is not. Tests reveal that bad chips cause equipment to stop, shut down, or malfunction when the dates change to January 1, 2000.

Most plants have thousands of these chips. One lrge petrochemical plant, for example, was found to have 150,000 embedded chips.

"Non-compliant embedded chps are buried in millions of systems, any of which mail fail in 200. It's a world-wide industry problem. Heavy 1980's reliance on embedded silicon cicrochips for storing dates and other tata has left many businesses, ncluding KUB and other utilities, vulnerable to far-reaching adverse affects if computer systems cannot comprehend year codes for 2000. Predictions

are that millions of embedded microchips will fail in `/2000, affecting everything from telephone systems and fax machines, to military messaging systems, the Global Positiong System, and coal, gas, hydroelectric and nuclear powered electric plants."—*Ed Medford, Knoxville Utilities Board, Knoxville News Sentinel, September 21, 1997.*

In a CNN interview, Y2K czar John Koskinen said that, out of 4 billion chiops installed int eh U.S. in recent years, an estimated 2-3% were date-sensitive, totalling 80-120 milion embedded chips likely to fail.

None of those old chips can be reprogrammed. They must all be replaced, one at a time. Many of them are in hard-to-reach locations, and large numbers are underground.

— ELECTRICITY —

THE ELECTRIC POWER GRID

This is the kingpin problem. When it hits, it will carry everything else down with it. Electrical power is the heart of Western Civilization.

The electric transmision grid consists of more than 672,177 circuit miles of lines. American's electric utnility companies spend almost $8 billion annually maintaining these vital power links to consumers.

"Many of the most dire Y2K scenarios are predicated on the assumption that the glitch will KO the country's electric utilities, turning out not only your lights but everything from the pumps at the gas station to the Slurpee machine at the 7-eleven. It's a plausible theory. The conventional and nuclear power plants that produce our electricity are all controlled to some degree—usually a large degree—by computers, and some of the suspect programs are etched directly onto silicon chips, making them even harder to find and fix. **Some utilities have only recently begun the process of ferreting out potentially weak links in their delivery systems. Worse, since most utilities are linked to one another in gridlike fashion, there could be a domino effect, turning local failures into regional blackouts.** But there are reasons to believe that blackouts may be averted or, at worse, short-lived. **Most of the larger utility companies have shifted their Y2K efforts into high gear and are speeding their repairs by sharing their findings through an online clearinghouse** set up by the Electric Power Research Institute. The utilities are

also under regulatory pressure. The Department of Energy has set a July 1 deadline for power companies to provide assurances that Year 2000 problems will be remedied in time.

"The real assurance, however, may be that many utilities aren't counting on complete success. Rather, most plan to have extra people and manual work-arounds in place for critical systems, according to Jon Arnold, chief technology officer at the Edison Electric Institute, which represents the public utilities that generate more than three-quarters of the country's electricity. 'People forget that the electric utilities have equipment failures and outages all the time,' says Arnold. He acknowledges that 'it's not going to be a typical New Year's Eve' in 1999. But he adds, Y2K 'is not like a storm or a random failure. We know this one is coming.' "—*Time, June 15, 1998.*

When the power grid goes down, it will take a lot with it. Commenting on this, Senator John McCain said this:

"The Y2K problem may result in failures of air traffic control and telecommunications, and of computer chips that contro industrial machinery and public transit systems. Computer cash registers, individual bank accounts, loans, student records, and payroll systems may be affected."—*Senator John McCain (R-Ariz), chairman of the Senate Commerce Committee, in Orange County Register, June 13, 1998.*

"Let's stop pretending Y2K isn't a major threat to our way of life. There's too much at stak for such uninformed wishful thinking. I say we must act as if we were preparing for war."—*Edward Yardeni, speech to the Bank for International Settlements, April 7, 1998.*

To add to the problem, it is difficult to restart the electric grid, once it has collapsed.

"Extensive blackouts are the nightmare of the power industry. Once power is intererupted n large metropolitan areas, diversity of electric use on teh network is lost. When power is restored, all thermostatically controlled electric loads come back on simultaneously. This stress, added to the higher demands of many devices such as motors and transformers, can draw up to 600% of normal load during restoration procedures."—*American Geophysical Union, in its publication, Earth in Space, March 1997.*

If the entire U.S. power grid were to go down, where would the power come from (six times the normal power) to restart it? Perhaps we will only experience rolling brownouts and some blackouts. But it could be far worse. Until it happens, we will not know.

"We're not longer at the point of asking wheter or not there will be any power disruptions, but we are no forced to ask how severe the disruptions re going to be."—*Senator Christopher Dodd (D-Conn),*

vice-chairman, Senate Committee on the Year 2000 Problem, June 11, 1998.

THE ELECTRIC UTILITIES INDUSTRY

How are the public utilities doing? Many of them may not be prepared when that special date rolls around. Here is a memo from one utility company:

> "There is a good chance many areas of our life may be affected when the computer interprets 01/01/00—numbers that should represent January 1, 2000—as January 1, 1900 . . It has been estimated that all existing programmers today would not totally solve the problem by January 1, 2000, even if they spent all of their working time on correcting the date. Almost every piece of software included that flaw . . One of the potential problems is the 'embedded chip,' which is used by a great number of appliances and automatic gadgets. There are billions in use, and unless they are checked, we may not know until January 1, 2000, which ones are date-sensitive."—*Tom Purkey, General Manager, Tennessee Electric Cooperative Association, The Tennessee Magazine, September 1998.*

Not very reassuring. Rick Cowles, a leading expert in the electrical utilities industry, estimates the chance of a power grid failure due to Y2K at 100 percent.

> "In January [1998], the Public Utility Commission of Texas surveyed the state's 176 [electrical] generation and distribution companies on their Y2K readiness. Only 44 percent responded. None were yet compliant, and none had any clear idea when they *would* be. Among Texas electric co-ops, only 18 percent had written plans for Y2K preparations, and 24 percent said they hadn't yet begun planning. So the PUC . . told them to "monitor Y2K issues" and then [PUC] put up a web page about the problem."—*PC Magazine, October 6, 1998.*

Are you ready for more?

> "About 20 percent of U.S. electric power comes from nuclear plants. But the Nuclear Regulatory Commission is required by law to shut down plants that cannot show they can operate safely. In June [1998], the NRC wrote the operators of America's 108 nuclear plants, demanding a statement of compliance, or concrete plans by the end of 1999. The number of compliant plants so far: 0."—*Time, June 15, 1998.*

And then there is this:

"40% of U.S. power comes from coal-fired plants. But coal plants require an immense, steady supply of coal, which arrives daily via huge strings of rail cars. Railroad-car movements in this country are controlled by aging computers and hidden embedded systems.

"In addition, about 30 percent of our electricity comes from gas-fired generators. Natural gas is controlled by systems built around PLCs [microprocessor chips]. And the gas industry has not been a leader in Y2K preparations."—*Time, June 15, 1998.*

The Senate Y2K Committee released a study which showed that of ten of thenation's largest oil and gas utilities, serving 50 million people, none had a complete plan in case its computers failed because of the Y2K problem. Committee chairman, Senator Robert Bennett said this:

"Only two of the ten utilities had finished an assessment of their automated systems, which is an early step in the preparation process. One firm did not even know how many lines of computer code it had, and none had completed a Year 200 contingency plan."—*U.S. Senate Y2K Report, June 12, 1998.*

Just what is required to fix Y2K problems? Figured as a percentage of total time and effort, Awareness is 1% of the project; Inventory is 1%; Assessment is 5%; Code Remediation is 50-55% (fixing the computers and chips); and Testing is 40%.

A Febuary 1998 California White Paper on America's power plants' Y2K compliance, most utilities were not past the awreness/inventory stage. That meant that 98% of the work was still ahead of them.

Based on that, if, by the end of summer 1998, all 7800 public utilities had completed their assessment stage,—they would still have 93-95% of their work yet to do—in less than 500 days.

"If we don't have power to generate electricity, everything else is moot."—*Senator Dodd.*

When asked by the Senate Commttee, how prepared the utility industry was for Y2K, James Hocker, chairman fo the Fedferal Energy Regulatory Commission, made this remarkable statement:

"The state of the Year 2000 readiness of teh utility industry is largely unknown."

If the utilitie in the other nations are behind ours in Y2K awareness, which seems likely, then the wolrd will lose its electric power. If national grids go down and stay down, the world tgoes back to 1850,—but without the skills and tools used in 1850 to cope with such a situation, and with a vastly larger population.

Already some utilities have reported plant failures when they have tested portions of their system.

Some people say that there really is no problem, for we can just return to doing everything manually. Actually, if you live in the country, to some extent you can. But many people—and most businesses will not be able to easily return to that way of life.

Senator Bob Bennett said it best in one of his Senate briefings, "Twenty years ago, we had the ability to 'go manual.' That infrasructure, that ability to do that, and the equipment to do that—has been dismantled. It isn't there anymore, unless you intentionally put it back in."

Then there is the domino effect: The entire electric power industry is interconnected. They re connected by computers and computerized equipment linking them together. What affects one will affect the others. Unless all computers in an industry are fixed, none of them can be safely maintained. (More on the domino effect later.)

Jim Lord, a computer consiutant to the U.S. Department of Defense and other governemtn agencies on the Y2K problem wrote this recently:

"I am a adding electrical utiliteis tothe greatest risk list. I believe there is a strong possibility of disruptions .....

========== 4 / 7 as marked

..... systems fail, it will become a done deal."

Jim Lord concludes with this comment:

"The combined effect of these [electrical and nuclear] shutdowns will be widespread .....

========= 4 / 7 as marked

.....and full service. It will not be a happy time."

Susan Thomas, world-wide director of UNISYS' Millennium Bug Remediation Program, in a March 2, 1998 interview with the Australian broadcast, said that there were more than 6,000 critical elements involved int he production and distribution of electricity that potentially can be affected by the Y2K problem. UNISYS cvame up with that figure after working with dozens of lectric power

clients aroudn the world on Y2K remediation. She said that the failure rate may vary form 8-11% for some of the 6000, to a low of 1-2% for some others. But, in order to know which need to be replaced, all must be tested.

Shall I cite one more serious problem in the electrical industry? We are on the verge of deregulation. Up the present time, the various power utilities worked together on, what is called, the "power grid." But Congress is in the process of deregulating the utilites, in the hope that the competition will drive down costs to the consumer.

But, unfortunately, the utilities have never competed, and it is believed deregulation will only add to the problem. When it begins, suddenly, on an hourly basis the grid will have to handle tousands of two-way electricity sales transactions between the utilities, wherein electricity is bought and sold, somethimes at acution, by businesses and power geneartion companies.

> "There is a fundamental problem that engineers talk about. The grid was not edeisgned for two-way trading. The potentioal for the complexity of the system borers on chaos."—*A.M. Borbely, Energy Services Rsearch, Mountain View, California.*

NUCLEAR POWER PLANTS

The nation's 110 nculear power plants account for 20-22% of the nation's electric power. The following states rely on nuclear power for over 50% of their electricity: Connecticut, New Jersey, Maine, Vermont, South Carolina, and Illinois.

Hundreds of automatic controls and thousands of embedded chips exist throughout a typical nuclear power plant.

In a recent memo to all U.S. nuclear power plants, the Nuclear Regulatory Commission (NRC) has warned that control room display systms, radiation monitoring, and emergency response systems are particularly at risk from Y2K faults.

The Nuclear Regulatory Commission has told nuclear power companies tht they must be Y2K-compliant by July 1, 1999. Whether or not they will be, there is an urgent reason for this requirement:

> "The NR C faces a tchnologically impossed dealine. It takes six months to cool the cores. It take s electriclal power to do this. In short, it takes the grid to enable the plants to shut down safely."—*NRC statement.*

If those cores are not cooled down, there could be nuclear explosions! Read this:

"As a nuclear engineer, I read with great interest the article aboaut the NRC mandate for all nuke plants to be compliant or else shut down. I was discussing the article with a couple of friends of mine who are also nuclear engineers. We were musing about the NCR's deadline, July j, 1999.

"At first we could not understand why the plants needed to be shut down six monthes in advance. Then it hit us. A 1000 electric megawatt nuclear plant generates about 3000 magawats of heat energy. That is 3 billion watts of heat energy. When a plant is scrammed [shut down], the nuclear fission stops almost instantaneously; however, the core still generates a tremendous amount of heart.

"This heat is called residual heat and is a result of the natural cooling-off of the core. Under ormanl circumstances, special pumps clalled Residual Heat Revoval pumps circulate water throught the core to keep it cool and remove excess heat. Emergency diesel generators can supply power to these RHR pumps whenever power to the plant is lost.

"Also under normal circumstances, it takes approximately four months 9depending on the operating power of the core) to cool a core to the point that loss of cooling will not damage the core. In other words, nuclear plants need six months to ensure their cores are cool enough and won't melt if power to the plant is permanently lost.

"Imagine the ensuing mess if nukes can't cool their cores."—*A nuclear engineer, writing in Grapevine Publications Network Newsletter.*

Behind the scenes, nuclear energy officials are scrambling to prevent their safety mechanisms from failing and triggering a nuclear meltdown.

"The potential for liability isk so enormous, that there will be very few nuclear power plant executives willing to say their copanyis Year 2000-compliant."—*Rick Cowles, manger of the Y2K program for Digital Equopment Corporation.*

SOLAR WINDS

Every 10.5 years, solar sunspots reach their maximum. This causes solar flares to erupt on the sun's surface, sending out larger amounts of solar winds. When these hit the earth, they discupt electricity and communications. The next sunspot maxium is

scheduled for around the turn of the century.

The power grid is subject to sharp fluctuations in times of solar flare storms.

"Solar Cycle 22 (the current 11-year sunspot cycle) which is now drawing to a close, produced not only above-average, but historic geomagnetic storm activity. As a consequence, above-average impacts to electrical system reliability occured due to storms, with the most notable instance resulting in a large area blackout. Also, several well-documented cases convincingly established that large, expensive transformers could be damaged by exposer to Geomatically Induced Currents (GIC0 that are produced by storms.

"Further, statistical evidence is showing that transformers are failing at an above-average rate in areas of the United States that are particularly prone to geomagnetic disturbances, resulting in well-above-average replacement costs. If that's not enough, experience teaches us that the odd numbered Solar Cycles (Cycle 23 in this case, which is in the process of initiating) have always been more severe than the enven numbered cycles that they follow.

"Threats to power systems integrity are no longer just academic speculations with the events that unfolded during the Great Geomagnetic Storm of March 13, 1989. In fact, the entire Hydro Quebec system was plunged into a blackout triggered by GIC caused voltage collapse and equipment malfunction. The impact of this particular storm was simultaneously felt over the entire North American continent with most of Hydro Quebec's neighboring systems in the U.S. coming uncomfortably close to experiencing the same sort of voltage collapse/cascading outage scenario . . Wide area blackouts are the nightmare scenario of our industry and geomagnetic storms that span large regions of the network impose a unique and previously unanticipated threat to interconnected system operation.

"During the same March 1989 storm, several incidents of transformer heating problems were reported as well. The most significant failure occurred at a GSU (generation step-up) transformer at a nuclear plant in New Jersey in which a 1,200MVA, 500kV bank was damaged beyoud repair.

"It is an interesting coincidence that the next major solar flare storm will hit in the year 2000, compounding and exacerbating an already highly streassed power grid. Like the "rogue wave" talked about in earlier issues of MIA, the Y2K computer meltdown, power company deregulation, and a new solar flare storm are all hitting about the same time. What will be the impact on U.S. power plants?"—*John Kappenman, head of transmission power engineering at Minnesota Power, Duluth, writing in IEEE Power Engineering Review, April 1996.*

— TRANSPORTATION —

U.S. RAILROADS

Coal-fired electrical plants represent 40% of all power plants in America. Most fossil fuel plants (coal or petroleum-based) have only 1 to 3 weeks of reserve fuel storage at any one time.

Coal-fired electrical power plants require deliveries of train loads of coal—lots of it. Many coal-fired co-generation plants require a 100-car trainload of coal every day, seven days a week.

Yet it would be relatively easy for the production of electricity to stop—if there was no electrical power for railroad switching and central controls. It requires electrical power to generate electrical power.

In the past decade or so, as they have become computer dependent, American railroads have all manual switching and most of their manpower. All rail car movment and inventory is now controlled by date-sensitive computer programs and embedded chips.

From the best information available, not one railroad is presently Y2K-compliant, and none are likely to be fully compatible by the turn of the century.

So it is likely that the coal will not be delivered to the coal-fired electrical generating plants, when the new century arrives.

Thus we find that the electrical power grid could go down in a flash from a gigantic overload. Or it could go down gradually, here and there, as the electrical generating plants fail. The end result is likely to be the same. Not brownout, but blackout.

TRUCKING AND THE OIL AND GAS INDUSTRY

Without oil, there can be no moving of trucks and automobiles. Without trucks, there will be no food, equipment, and supply shipments to your town and the businesses in your town. Not only your food will stop, so will all manufacturing and business operations—big and little.

Without energy (electrical, oil, natural gas, and coal) home life and business life cannot operate the way we know it. Office buildings would close down and industrial production would cease.

Oil and gas production, refining, and distribution are nearly as essential as electricity.

According to the Federal Regulatory Commission, oil and gas provide 65% of the energy used in the United States. They are used to power vehicles, heat buildings, and generate electricity. Without them, waste treatment plants close down, and iron and steel production comes to a stop.

According a Shell Oil estimate, America has about 220,000 miles of oil and gas pipelines. They are to be found all over the continent, and even under the oceans.

Pumping stations all along these pipelines keep the oil moving at a steady rate.

> "Pipeline control and terminal opertions have become a particularly computer-intensive opeation, relying on computer systems to control pumping and to detect any leaks."—*John Mills, director of corporate affairs, Shell U.K.*

Failed chips could either give false information, or shut down the system entirely. Some of these chips are underground, or on the ocean floor. Some of the deepest ones are off the coast of Alaska and in the North Sea, where the depth of the sea floor is in miles, not feet. Only a few vessels are able to take divers down to such depths. Each dive would cost $500,000.

Embedded chips are not only in pipelines and pumping stations, but also in control, metering, calibration, and tracking devices.

> "A typical offshore platform or onshore gas plant uses 50-100 embedded systems. These systems contain up to 10,000 individual microchips. We have found that up to half of these systems are critical in terms of production and the impact of our activities on the environment."—*John Mills.*

"As of August, 1998, only 19% of oil and gas producers, refineries, deliverers and gas stations surveyed had examined areas where problems could occur."—John Koskinen, Clinton Administration Y2K czar.

Yet assessment is only the first 7% of becoming Y2K compliant. As of August 1998, 19% of the oil and gas industry had accomplished 7% of what needed to be done to be ready for January 1, 2000.

> "Wells may not be drilled on time, oil and gas shipments may be delayed, and refineries could sit idle. These are just some of the worries executives at San Antonio-based oil and gas companies have as the millennium approaches."—*San Antonio Business Journal, January 25, 1999.*

Let us look more closely at the natural gas industry:

Natural gas is a major energy source in the United States. Natural gas provides 30% of energy productoin and 25% of energy consumption in the nation. More than 50% of the energy consumed by residential and commercial customers is supplied by natureal gas. It provides 40% of the energy used by U.S. industry, and 27% of this production comes from offshore areas. Of all the natural gas consumed in America, 99% is produced in the U.S.

There are over 60 million residential and commercial natural gas customers in America. This totals 175,000,000 American consumers. It is used in 53% of American homes (59 million). The U.S. produces 24% of the world's natural gas production. It accounts for 11% of the electric power generated.

So natural gas is not something we can easily do without.

Any significant disruption, even though it be short term, in this supply could cause great difficulties for many of us.

All the natural gas companies work together, and the 1,300,000 miles of transmission and main distribution lines in North America are interlinked.

The natural gas industry is heavily reliant on guess what? — embedded chips. They are especially used in PCs, network servers, process logic controllers, transmission, storage, and delivery.

Of the 125 pipeline companies, 1200 distributoin companies, and 288,000 gas wells,—no one in the natural gas industry is coordinating the fixing of those microchips! The Interstatee Natural Gas Association, and the Gs Research Institutue are both condicting surveys of their members, according to Kathleen Hirning, of the Federal Energy Regulating Commission. And that is it. Surveys, and little more.

Perhaps some of those companies are trying to fix their Y2K problems. But, surely, there are others which are not succeeding. Since they are interlinked, trouble is ahead.

How many pipelines companies will have to experience Y2K-related failures, before the whole system goes down? Time will tell.

Keep in mind that natural gas provides 25% of the energy consumed in the United States.

SHIPPING

Ships use the GPS (Global Positioning System) to travel from one place to another. But that system will shut down on August

22, 1999. (More on this later.)

In addition, there are hundreds of embedded chips employed in on-board shipping operations, as well as at docking terminals. The shipping industry relies heavily on out-dated computer equipment.

As if that is not problem enough, read this. It comes from a high-placed official at the U.S. State Department, presented to a congressional committee on March 5, 1999:

> "Both the Panama and Suez Canals face the risk of disrupted opoeratoins should their traffic management systems fail, or should shipos traversing teither canal have problems with their entines and/or steering systems because of Y2K. Panama Canal officials told us they will not allow any ships into the Canal's locks on Dember 31, 1999."—*Jacquelyn Williams-Bridger, Insprector General of teh U.S. Department of State, in a 12-page report presented to the Sentate Special Committee on the Year 2000 Technology Problem, March 5, 1999.*

THE AIR TRANSPORT INDUSTRY

Then we come to the airplanes. No one knows what to do about Y2K, but most everyone agrees that they do not want to get on an airplane when the clocks switch from 1999 to 2000.

When one Y2K expert asked airline pilots what they think about the matter, he was told that they know of a number of pilots who intend not to show up for work when the century changes. So do not worry about plane crashes. The planes may not be flying.

But they will not be flying for another reason: If the planes were to fly at the turn of the year, the legal dangers would be too great to all concerned.

> "The airports, the municipalities that typically or regulate them, and the airport service vendors will present greater risks [in case of accidents] than the insurance industry will be willing to bear. For lots of reasons, look for severe, worldwide disruptions in air traffice in January 2000."—*Jim Lord, Global Y2K No-Fly Zone, December 1998.*

As reported by the AFP news agency at a press conference in paris on November 26, 1998, two high-ranking French officials said they doubted that there would be any air traffic come January 2000, anywhere in the world!

> "It is likely that aircraft will be grounded on January 1, 2000, out of fear of possible air chaos caused by the year 2000 com-

puter bug."—*Dominique Strauss-Kahn, French Finance and Economy Minister, quoted in AFP news.*

That would be a wise decision, for air crashes could cost the airlines hundreds of millions of dollars in lost aircraft and civil suits. If they book flights, knowing that Y2K might cause air accidents, the airlines would be accepting a huge liability exposure.

"It is reasonable to expect most airlines to ground their planes prior to the New Year and stay grounded until deemed safe . . If the air traffice radar system or contingency paln does not work, the Department of Transportation will not let anyone fly."—*U.S. Coast Guard statement, on its web site.*

You can expect that all existing reservations will be cancelled, and the airlines will stop taking new ones. They will keep their planes safely on the ground when the new year arrives.

"The specter of losses caused by millennium big-related damage has begun to haunt insurance markets . . The airline industry is . . a problem. . At a recent aviation conference one speake said the question of whether airlines will operate on December 31, 1999 is enteirly in the hands of the insurance industry."—*Reuters, December 24, 1998.*

Ironically, those planes will not be moving on the ground either! Due to Y2K malfunctions in the computers, planes moving on the ground could collide, just as easily as they could in the sky.

For a period of time, they will just sit tight.

— U.S. BUSINESS —

Newsweek calls it "the day the world shuts down" and "the event that could all but paralyze the planet." The *Wall Street Journal* calls it "the most expensive accident of all time." *Computer World* says "the problem is far worse than even the pessimists believe!"

"Have you ever been in a car accident? Time seems to slow down as you realize you're going to crash into the car ahead of you.

"It's too late to avoid it—you're going to crash. All you can do now is watch it happen.

"The information systems community is heading toward an event more devastating than a car crash. We are heading toward the year 2000. We are heading toward a failure of our standard date format: MM/DD/YY.

"Unfortunately, unlike the car crash, time will not slow down for us. If anything, we're accelerating toward disaster . .

"Our information systems are based on a faulty standard that will cost the worldwide computer community billions of dollars in programming effort . . We and our computers were supposed to make life easier; this was our promise. What we have delivered is a catastrophe."—*Peter de Jager, "Doomsday 2000," Computer World, September 6, 1993.*

—That was written five years ago! Yet today relatively few businesses and governments in the world are doing much about the problem. And those which are (primarily in the U.S., Canada, and Europe) have started correcting the problem too late to complete it in time.

"The mainstream is now beginning to report a phenomenon that has been known to computer professionals for years: There is a computer software and hardware problem of Goliath proportions looming on the horizon. The problem is a result of the simple fact that for years computer programmers have programmed computers to read and interpret dates using a 2-digit year. On the cold night of December 31, 1999, as the clock rolls over to 12:00 midnight, millions of computers and other devices will begin spewing out bad data, malfunctioning, or simply shut down."—*Jason Peck, "A Programmer's Perspective," April 27, 1998, online data.*

MAJOR U.S. BUSINESSES

Senator Robert Bennett's Y2K Committee reported in June 1998, that 58% of U.S. busnesses polled have not even calculated Y2K costs; fewer than 60% of U.S. businesses have even completed preliminary assessments to determine the extent of their problem. The committee concluded that remediation efforts by the largest corporations fall considerably below levels necessary to avoid severe business disruption.

A recent poll of 400 chief information officers (CEOs) and chief executive officers (CEOs) of Fortune 500 companies indicated that 70% of them hav underestimated the dimension and cost of the problem, more than 70% of those executives do not believe that repairs will be in place on time, and 50% do not yet have a detailed plan in place. Most companies have tripled their original estimates of teh cost of fixing their Y2K problem.

By the way, who is going to do the fixing? There are not enough to do it. Of the 340,000 qualified people in the world to do the job, according to Peter deJager, twice that number are needed. With such an acute shortage of software programmers, companies have been raiding one another's experts—by offering them high salaries if they will come work for them.

BUSINESSES—Businesses everywhere have been remarkably slow in getting started at dealing with this problem. Yet businesses in America are far ahead of those in most other countries.

For example, in late July 1998, United Airlines issued a progress report on its efforts to fix its Y2K problem. Viewing it causes one to draw in his breath. The extent of the problem to be repaired is fabulous. United Airlines found 40,000 computer programs that need checking—and 11,000 of these need fixing. This software affects a wide range of functions from payroll and accounting to the frequent flyer program to scheduling, reservations, and inventory. United is also scouring flight equipment—including communications, baggage systems, and avionics—to see what needs repair.

United says that, to-date, it has completed about 70 percent of its Y2K work on its critical core computer systems. That means the airline, like many others, is using triage. It is concentrating on its most vital issues and waiting until later to handle the remainder.

Arthur Levitt Jr., chairman of the Securities and Exchange Commission, has sent letters to more than 9,000 publicly traded companies, demanding accurate reports about their Y2K repair projects.

BankAmerica is spending $600 million and Citicorp $380 million on their Y2K programs. Merrill Lynch estimates that the economic impact of fixing this problem will be $600 billion to $1 trillion.

Chase Manhattan Bank runs an estimated 200 million lines of program codes. They have already allocated $200 million (a dollar per line of code) to correct their Y2K problems. How many organizations can afford to spend money like that? Citicorp, alone, has 400 million lines of code.

Often businesses use custom-made applications written in relatively ancient computer languages, such as COBAL. Programmers must be recruited or pulled out of retirement, to check and correct date calculations buried in thousands of lines of computer code.

The Federal Drug Administration estimates that 2,700 medical device makers (out of 16,000 companies) have products that could be affected by the Y2K glitch. Yet, despite the life-and-death implications, only about 500 of those firms have reported that they are trying to solve the problem.

What if only 5 percent of the businesses fold because of Y2K? Or 5 percent of the medical equipment starts killing people? What if only 5% of the banks fail? Even a little failure would powerfully affect the nation.

What about the automobile industry? The chairman of Dana Corporation, one of the larger parts suppliers to General Motors, recently said that Y2K is the biggest problem ever to confront the U.S. auto industry. That comment would indicate it is bigger than crisis which began in 1929, when the Great Depression caused auto stocks to drop 90%.

> "Amazingly enough, machines on the factory floor are far more sensitive to incorrect dates tha we ever anticipated. When we tested robotic devices for transition into the year 2000, for example, they just froze and stoppped operating."—*Ralph J. Szygendon, chief information officer at General Mtors, Fortun magazine, April 27, 1998.*

Most of the 100,000 suppliers to General Motors are not Y2K-compliant, or even close to it. According to above article in *Fortune* magazine, GM and the other auto companies are higly dependent on embedded chips.

General Motors alone is spending over $1 billion on solving Y2K, but it appears that parts suppliers will still bring it down. More on this later under "The Domino Effect."

The major Ameircan auto companies have over a billion lines of code and hundreds of thousands of chips embedded in equipment. All of it must be examined and, when necessary, repaired.

Next to the utilities, the communications industry is crucial to our modern way of life. Add to that transportation. It appears that Y2K will have a deadly effect on all these. Let us consider U.S.

telephones and telecommunications:

Lou Marcoccio, a resarch director with the Gartner Group, says there is a 50-60% chance each major carrier will experience at least one failure of a mission critical system. Yet most of the major phone and telecommunications companies have already spend billions of dollars to solve the Y2K problem.

However, the communications industry appears to be better prepared than many other industries.

To whatever degree, the phone and telecommunications goes down, it will take with it business, government. Police and fire protection will be stopped in its tracks.

While we are on that subject, read this:

> "The vast majority of police and fire equipemtn is not year 2000 compliant."—*Michael Powell, Federal Communications Commissioner.*

> "**AT&T, for one, says it will have fixed and tested most of its heavy computerized network by the end of this year**, and will spend next year making sure its systems work with upgraded gear at other phone companies."—*Time, June 15, 1998.*

The U.S. Air Transport Industry is also in danger of going down.

Without air transport, much of U.S. business would quickly come to a halt. Aside from personal and business air travel, there is are the mail deliveries of the USPS, UPS, Fed Ex, DHL**.**

Part of the problem here is the remarkable lack of preparedness by the Federal Aviation Administration. It runs the nation's air traffic control systems. As of April 8, 1998, independent auditors estimated that only 29 out of 430 FAA computer systems are Y2K-compliant. That is less than 7% of the total!

Tens of thousands of flights occur every day, and it would all stop if the FAA dropped through the floor. Stanley Graham, a consultant at Tech-Beamers, Inc. testified before Contgressional hearings, and said that the FAA Y2K repair work will not be completed until the middle of the year 2009. The National Civil Aviation Review Commission says the planes could stop moving, and the resultant damage would severely damage the U.S. economy.

When the General Accounting Office released a highly-critical report of FAA preparedness, Rep. Bart Gordon (R-TN) commented

on the report that the nation could be devastated as a result.

—Yet you may notice that you are reading little about this in the nation's press. Ho-hum, everything is doing well; the economy is good, and stocks are up. Who cares about a massive federal debt, an immense nationwide increase of personal debt, and a wild craze for entertainment, gambling, abortion, and theatrical entertainment.

Large jet airliners, both in America and overseas, have hundreds of computers and thousands of embedded chips on board. Some of the most complicated of these systems have been introduced into the past 15 years. Much much of that computerized equipment relies on non-compliant programs and chips.

The Boeing Company has announced that its earliest jets, and most recent ones are safe, but the ones in between (of which there are the most) needed some attention. A similar situation probably exists with Air Bus in Europe.

According to an April 19, 1998 report by Associated Press, the newest airport in the world, the Denver International Airport which opened in February 1995, is not compliant in 100 of its systems. Incuded here are flight and baggage, communc9iations, underground trains, etc.

If Denver International—with the very newest equipment—is not ready, what about thousands of older airports?

> "**There are the thousands of far-flung clinics, labs, and pharmacies that need to check their equipment. 'I do believe there are going to be some unnecessary deaths,'** says Ackerman. But even here the anxiety may outstrip reality. Tests suggest that **only a small percentage of medical devices could be impacted by the date change, and fewer still will directly affect patient care.**"—*Time, June 15, 1998.*

Here is the latest report from *Newsweek,* which obtained this data from the Gartner Group:

"The U.S. health-care industry lags far behind other organizations in terms of its preparations for the Millennium Bug.

"16% of all companies surveyed have not yet started any preparations for the year 2000.

"37% of health-care organizations surveyed have not yet started preparing for the Millennium Problem.

"83% of U.S. health-care organizations are not for profit, and

therefore have limited Y2K resources.

"2-3% of their net operating budgets goes to information technology, half the average company share."—*Newsweek, June 29, 1998.*

Some say that there really ought to be no date-sensitive computer chips in pacemakers, defibrillators, or elevators. Unfortunately, manufacturers often installed standard chips to equipment which included dating factors, even though no dating was needed.

SMALLER U.S. BUSINESSES

Most business and employment in America is located in the samll business sector. Many experts are predicting that at least half of America's small to medium sized companies will not be Y2K compliant by the turn of the century. (Fortunately, as of January 15, 1999, the one which publishes this book is compliant.)

Wells Fargo BAnk conducted a sampling survey, and estimates that nearly 5 million small U.S. businesses will encounter end of the century problems which will disrupt their work. Three-fourths of the businesses surveyed said they had done nothing to prepare for what was coming. Fifty percent said they had no intention of doing anything, and would wait to see what happened when 2000 arrived!

A Gallup poll, taken in April 1998 for the National Federation for Independent Bussinesses, found that 82% of those firms surveyed were going to encounter computer problems, and 34% were expected to have microchip breakdowns.

Then there is the study by the Gartner Group. It found that 84% of companies with fewer than 100 employees have done essentially nothing to prepare for Y2K. About a third of those comapnies rely heavily enough on computers that they will have problems at the turn of the new century.

Much of our ecoonomy is based on small business activity, which is generally ignorant of Y2K problems, and does not have the money to fix them.

The NFIB Research Foundation predicts that 330,000 small businesses will close their doors permanently, and another 370,000 will be temporarily crippled when January 2000 arrives. That alone could drag the nation into a crippling depression.

FEAR OF LAWSUITS

Ironically, the fear of lawsuits is holding many businesses back from properly preparing for the inevitable crash. Outside computing consultant firms are begining to refuse to take remediation assignments with businesses because, if there is later failure, they too may be sued by the rapacious lawyers and their clients. Many of these consulting firms (including International Business Machines and Educational Development Services) will accept no new clients because of the danger of lawsuits.

It is expected that over $30 trillion in liability lawsuits will begin after the turn of the century. In the spring of 1999, Congress is trying to enact legislation limiting Y2K liability, fearing that such suits will devastate America's businesses and, with their collected hoards of fees, the nation's lawyers will retire. But the legal associations of the nation are hard at work fighting the legislation, so it may not pass. Everything will depend on which lobbyists offer the biggest wads of bribery cash to the senators and representatives.

> "The consulting arms of several big accounting firms, fearing lawsuits, are refusing to fix year 2000 computer problems or offering to do so only for certain clients. Many computer consultants initially jumped at the chance to rewrite old computer code or convert computer systems to use new code that acknowledges the year 2000. But an increasing number are shunning the work because 'they're afraid of being sued,' says Larry Martin, president of Data Dimensions, Inc., a computer consulting companay in Bellevue, Washington. Just listen to Carl Sellberg, top technology partner at Coopers & Lybrand. 'We don't do year 2000 work other than to warn existing clients that they may have a problem,' he said, adding: 'There's a great deal of risk of litigation. 'Deloitte & Touche's top consulting partner Pat Loconto says his firm isn't soliciting new clients for year 2000 work other than because the firm doesn't want to be view as a deep pocket in potential lawsuits. The legal departments in many companies are now telling employees not to reveal any information on their Y2K remediation status to customers or the public for fear of lawsuits. So, if everyone clams up about their y2K progress, and consultants back away from fixing business coputers for fear of lawsuits, we will be flying blind, and the whole repair process in corporate America is probably going to slow down dramatically. Wouldn't it be ironic if America, the most litigious, lawsuit happy country in the world (in which lawsuits have become a form of legalized plunder or theft), didn't get its business and banking

computers compliant because of everyone's fear of lawsuits? When the post-mortem is done on the U.S. economy, after it has melted doen as a result of Y2K, one of the important factors as to why we didn't get it fixed may well be because of fear of lawsuits. The government should pass a moratorium on Y2K-related lawsuits but the lawyers' lobby is too strong, and that probably won't happen."—*Consultants Shunning Work on Year 2000," in Wall Street Journal, June 29, 1998.*

FAILING THE TEST

Repeatedly, in test after test, utility and manufacturing plants have failed crucial advance tests of Y2K-compliance of their equipment.

Item: One large firm decided to test its elevators, after it decided they were all compliant. The problem was those embedded chips. Some elevators were made with one type of chip, and others with another. When the test was made, some elevators went to the top and refused to move again. Others worked fine. While still others proceeded to the bottom, and then went dead. Getting the shut-down elevatators to start again was a difficult task.

Item: At one nuclear power plant, a facility was tested off-line, and an embedded chip controlling the cooling system failed. If this had happened after the end of the year, dire consequences might have followed.

Item: The public water system at Coff's Harbor in Australia was tested for Y2K compliance, and failed. It was determined that, if this had happened in real life, so many toxic chemicals would have been dumped into the water supply—to kill the entire population. So if you drink city water, keep this in mind come next January.

Item: Since both were off-line and being used as hot-spares, two coal-fired power plants were tested for Y2K compliance. When they were, the plants immediately shut down. The problem was an embedded controller chip.

So that was fixed, and the two plants were tested again. Immediately everything shut down again—cause by another chip.

That was replaced and a third test was made. Once again everything shut down; this time due to a problem with a third chip.

Checking into the matter, it was decided that this third failure was of a nature able to bring down a portion of the national grid—

if those plants had been on-line.

> *Item*: In *Fortune* magazine, for April 27, 1998, Ralph Szygendon, chief information officer at General Motors, told of a test at one GM plant. In order to evaluate the extent of the problem, the plant engineers advanced their computer clocks to the year 2000. Instantly the entire plant was incapacitiattred, as robotic devices froze in mid-air.

Item: In 1ate 1997, Chrysler Corporation shut down its Sterling Heights assembly plant, and then turned all clocks to December 31, 1999. The engineers expected a few problems, but they were astounded at the number and variety. Chrysler chairman, Rboert Eaton, said, "We got lots of surprises." No one get even get out of the doors. They were all locked in.

Item: Failure so far at every power plant:

> "Every test I have seen done on an electrical power plant has caused it to shut down. I know of no plant or facility investigated to this date that has passed without Y2K problems."—*David Hall, an embedded systems consultant at Cara Corporation, on the Netly News, May 13, 1998.*

Item: During Y2K testing, Shell Oil has found a 20% failure rate on their vessels and offshore rigs. Chevron also reported a high rate of test failures and has instituted a new policy that in any ship in transit at the turn of the century, will remain out in ocean and will have a minumum of 30-days provisions on board.

A large drilling copmany recently ran a test on one of its large ocan drilling rigs. All they did was set the clocks to 2000. Immediately the rig shut down, and they can't get it started again!

Item: In 1993, the North American Air Defense Command (Norad) in Cheyenne Mountain, Colorado, conducted a test to see what would happen to all their computers, especially the ones that warn of a nuclear attack against America. As with nearly all coputers, years were designated only by their last two digits. A few entgineers had been speculating: What would happen when 2000 came along? This is what happened: At the tick of "midnight on December 31, 1999," everything froze the screens that monitored the early-warning satellites and radars and other communciations systems that would detect a flock of missiles or bombers coming our way. "It all locked up at the stroke of midnight," recalled Robert Martin, a top comupter specialist.

THE DOMINO EFFECT

In the Western Civilization today, the shutting down of a few key industries or utilities can shut down all the rest. One example should suffice to explain the problem.

In March 1996, two brake plants in Dayton, Ohio went on strike against General Motors for 17 days. GM's just-in-time inventory and delivery procedures rather quickly shut down 26 of the 29 GM assembly plants. Immediately, 18 other parts manufacturing plants shut down to prevent inventory buildup. By this time, 177,000 employees had been furloughed. All aside from this, slowdowns and stoppages occurred in more than 100,000 companies which are third-party venders to GM. They provide various small parts for the vehicles. In those 17 days, GM lost over $900 million directly. Indirectly, it and its suppliers lost twice that amount.

The interconnection of the utilities with one another, and the way, when they shut down, everything else shuts down—is remarkably similar to what happened to General Motors in March 1996.

The total shut down can (and probably will) start with the utilities. Yet, as far as big busines is concerned, it could begin with the many small suppliers who provide them with parts and supplies. Virtually all large comapnies rely on hundreds, if not thousands, of external hardware and software vendors, utilities, banks, transportation and other service providers. A date-conversion problem in a few places can cause grief to the whole system.

When General Motors sent out questionnaires to its suppliers as to their Y2K preparedness activities, only 26% even wrote back! So GM trained about 200 men to go out see what was going on. They discovered that most of their suppliers were unprepared and not preparing. They do not have a plan, and do not wish to talk about. Cost overhead is high, they are just getting by, and do not wish to deal with such a big headache. They would rather forget it, and wait and see what happens.

So there will be lots of days off for the workers of America, come January 2000.

If you want to add to the above domino effect, the power company serving the Detroit area and its auto companies, Detroit Edson, is far from being Y2K compliant. Several authorities in the field have predicted it will not make the 2000 deadline.

Here are more falling dominos: Experts declare that the string

of labor union strikes against auto companies in recent years has so weakened the financial status of the parts suppliers, that they do not have the money to fix their Y2K problems.

What will happen when the auto industry—the largest industry in America—lays off its millions of workers? More domino effect, Still more people and businesses will go under.

Here is two other examples of how easily the dominos can fall:

On April 14, 1998, American Telephone and Telegraph had a phone hub fail becuase of a software problem. This cascaded through their systems, and quickkly brought down 43 other hubs, ccutting off service to immense numbers of telephone customers. Banking transfers, manufacturing orders, e-mail services, and many other forms of information transfer systems wer affected. AT&T CEO Michael Armstrong said that the software problem started in two of their frame relay switches and spread to 145 nodes across the frame relay network. The outage lasted 20 hours. AT&T has about 40% of the 6,000 network customers in America.

This crisis happened for only one day. What would have happened if hundreds or thousands of embedded chips went down, and phone service stopped for a very extended period of time?

What would happen in America, in Canada, in Europe, in Western Civilization? Add to this falling dominos of electricity, trucking, trains.

In May 1998, just one communications satelitte went dead. Just one.

> "As many as 90% of the more than 44 million pager customers nationwide lost service Tuesday when a communcations satellite [Galaxy IV] spun out of control, causeing the largest and longest outage of its kind. The blackout, which hit at 3:18 p.m., affected everyone from doctos and emergency crews to the FBI and other law enforcement agencies to child care providers . . For many, the incident reveals the nation's dependence on high-tech communications and its vulnerabilities . . CBS radio and television, the Chinese Television Network, and the CNN Airport Network send feeds thorugh Galaxy IV. CBS relies most heavily on Galaxy IV."—*Los Angeles Times, May 20, 1998.*

What would happen if telephones and other transmissions, along with electricity and transportation, went out for a month or so? Some predict that it would bring on the greatest depression in the history of the nation.

— U.S. FINANCE —

The experts advise that the banks and insurance companies are perhaps in the best position for being ready for Y2K, with the telephone and telecommunications industry lesser so.

THE BANKING SYSTEM

"**Many in the numbers-laden banking and securities industries have been pouring money and manpower into the Y2K problem for two or three years.** Their megamergers notwithstanding, Citibank and NationsBank each say they will be done with their internal fixes this year, and are scheduling tests to make sure money can flow through the Federal Reserve. The Securities Industry Association, meanwhile, has scheduled a Year 2000 'dress rehearsal' next month for its members, who handle about 90% of the trading volume in the U.S., with a full-blown readiness test scheduled for March 1999."—*Time, June 15, 1998.*

From the best we can learn, the majority of smaller banks are Y2K-compliant. But the banking system is large and interconnected in a variety of ways. For this reason, it is not as safe as some may imagine.

The banking system includes banks, credit unions, thrifts, and savings & loans. There are several ways they can be affected by Y2K problems:

First, they rely heavily on computers. These have to be compatible, but the banks generally have the money to make sure they have the best equipment.

Second, there are bank customers, suppliers, and regulators. This can prove to be more difficult.

Third, there are the electrical utilities and telecommunications, including telephone. This could well prove to be much more of a hazard.

Fourth, there is the Federal Deposit Insurance Corporation (FDIC)< National Credit Union Administration (NCUA), and Office of Thrift Supervision (OTS). Government agencies are notorious for their lack of Y2K preparation.

Fifth, is the very worst of all! The public is reading all the ominous Y2K reports in the media, and there is a strong likelihood that a run on the banks will occur in late 1999. This could pro-

duce a crisis of major proportions in America! Yet any thinking person is likely to want to take a sizeable portion of his money out of the bank, in view of what is coming. Who dares to lose contact with all his funds, other than those in his home, for three to six months?

As of spring 1999, it appears that about 1,400 banking insituttions will be shut down by government agencies in June. This will be 10% of the regulated banks, credit unions and thrifts.

The FDIC is closely checking on the banks, and according to schedule, in June 1999, will begin shutting down "Y2K troubled" banks, and transferring their assets to other banks. The NCUA and OTS is working on a similar schedule.

Obviously, when the general public reads that 10% of the banks have closed down, will not that prompt many to more seriously consider withdrawing their money—while they still have time?

It is true that the bank closures will actually have strengthened the banking system, but the man on the street may not see it that way.

Indeed, the federal government is expecting a run on the banks. The Federal Reserve has ordered the Treasury Department to begin printing $50 billion in extra paper money. But that amount figures out to a rather pathetic little amount, in comparison with the number of people in the nation.

The Federal Reserve says has another $150 billion stored up. This would total $244 billion—which is about 7% of bank deposits in America, which total $3.6 trillion. That averages out to about $2,440 per U.S. household.

If the banks fail to provide enough money to match the demand for withdrawals, a bank holiday will be declared (as was done in March 1933), and the nation will be in real trouble. When currency withdrawals are frozen, people really panic.

> "This [Federal Reserve cash increase] is the fist time the Fed has ever planned for a nationwide demand for extra cash . . The Federal REserve plans to boost currency inventories by a third next year in case U.S. consumers want to have more cahs on hand when January 1, 2000 arrives, a Fed official said Wednesday . . As a backup to the $460 billion in circulation, the Fed will add $50 billion to the $150 billion in cash reserves next year . . The Fed estimates that the U.S.'s 70 million houeholds on average might withdrw $450 to pay for necessities, such as food and gas, as Y2K problems are fixed."—*USA Today, August*

20, 1998.

Keep in mind that there are over $1 trillion in global foreign exchange tarnsactions each day, and 80% of that activity is keyed to U.S. dollars. Obviously, the entire system is in danger of collapse—not only because of the global financial networks, but because the Y2K problem exists everywhere in the civilized world.

With such fears in mind, the banking industry is feverishly at work—trying to solve its Year 2000 problems. Chase Manhatten is spending $363 million; BankAmerica - $550 million; Citigroup - 850-925 million; J.P. Morgan - $300 million; Wells Fargo - $200 million; First Union Corporation - $60-65 million; Bank One - $350 million; Bankers Trust - $220-260 million (courtesy of American Banker, December 18, 1998).

When 1999 draws to a close, do not send money by wire! This is an absolute. The money is likely to just disappear, with no record or way to retrieve it. Swiss banks have already announced that they will probably not handle any bank wires at the end of December and first part of January.

The danger of bank collapse is so real, that some experts advise to get your money out before May 1999. Cash retrieval problems coud accelerate in the second quarter of 1999 and intensify in the the third quarter.

Alan Greenspan speaks:

> "Washington—Federal Reserve Chairman Alan Greenspan says it"s not a good idea for people to be carrying around a big wad of cahs New year's Eve 2000. The most sensible thing is to leave it where it is [in the bank].' he told the Senate Banking Committee on Tuesday. Greenspan said Americans' money will be safe in financial institutions.
>
> " 'There's almost no conceivable way . . that computers will break down and records of people's savings accounts would disappear,' he said. 'There's, fortunately, so many checks and balances that if it's knocked out one place, it's available in 20 others."—*Greenspan: Don't Worry about 2000," Associated Press, February 24, 1999.*

— U.S. GOVERNMENT —

GOVERNMENTS—The U.S. Government is far behind indus-

try in tackling the Y2K problem. It is generally conceded that government on all levels will not be fully prepared when the millennium changes. A number of federal agencies will be especially unprepared (see *Report Card*, below).

Here is a recent report from one government agency which is trying hard, yet recognizes that it has a lot more to go: The U.S. Postal Service hints that there may be trouble ahead:

> "The Year 2000 challenge extends across the entire information technology industry and includes any system, equipment or product that uses date data . . The Postal Service has thousands of components ranging from information systems to mail processing equipment, from forms to elevators and security systems, that may not function properly when the century date changes. Anything that manipulates or takes action based on a date has the potential for failure or, possibly worse, inaccurate operation.
>
> "For the Postal Service, the Year 2000 problem affects application programs, data, operating systems, computer hardware and a wide variety of equipment (*e.g.,* mail processing equipment, heating and air-conditioning controllers, and telephones) . . For more information, go online to www.usps.gov/year2000>"—*Memo to Mailers, USPS, August 1998.*

Notice that USPS does not say it is going to solve its problem in time.

The Internal Revenue Service has been trying to replace its non-Y2K system for 11 years. So far, it has spent $4 billion—but with no success. The system contains over 100 million lines of code.

We are told that the nation's banks will be okay when 2000 rolls around. But what about the bank that controls them? U.S. senators have the authority to get things done; yet when Sen D'Amato (R-NY), acting in official capacity, asked the head of the Federal Reserve whether it would be ready for the turn of the century,—he was told "no comment." The organization responsible for stability in our nation thinks it is none of anyone's business whether the Fed will exist in a year and a half! This is the banks' bank. You cannot get your money if they cannot get theirs.

U.S. FEDERAL GOVERNMENT

Rick Mayburry said this:

> "Human orgniations can be dividded into two types, smart and stupid. Private organizations tend to be smart, for they have a built-in mechanism buiding them to do a good job. This mechanism is customer choice. If the customers do not like the quality or the price of a baker's bred, they can refuse to buy. The producers must do a better job or they go broke.
>
> "A stupid organization is one which has no such guiding mechanism . . Even if a government were staffed entlirey by geniuses, it would still lack the guidance system of supply, demand, and price. It would be an all-star football team running plays written by a chimpanzee. "*—Rick Maybury, Early Warning Report, October 1996.*

It is hard for governments to get motivated to solve problems. Instead, its concern is to maintain and increase political power and control.

There is not a large number of people clamoring for Y2K solutions, so government yawns and, like the Mississippi River, just keeps rolling along.

When we consider the government, we run into problems, serious problems. And they will affect you. Not only our government, but governments all over the world are not prepared for the coming crisis.

The *Financial Times,* for January 13, 1998, reported that **60 leading business executives had just drafted a statement which was delivered to President Bill Clinton and the prime ministers of Britain and Canada—pleading with them to solve the problem!**

> "We fear that governments lag in assessing and addressing the problem," the statement said. It warned that **disruptions could extend to** "delays in welfare payments, **the triggering of financial chaos by a breakdown in revenue collection and debt management, and malfunctions in the air traffic control and defense systems.**"

I did not say that—60 top executives said it. And they said it only a few months ago! A crisis is looming for the governments. Among the 60 corporate leaders who signed the statement were the CEOs of Lloyds TSB Banking Group, British Aerospace, BAT Industries, Ford Motor Company, Thames Water, Bechtel Group, Unilever, Bombardier, and Texas Instruments.

This was the first time that a group of leading business executives had openly sounded the Y2K alarm. They did it out of desperation. They have far more information than we have on the extent of the crisis in the governments of the world.

Here is a statement from the research department of J.P. Morgan Securities, a leading U.S. investment house in New York City:

"**U.S. Federal Government: Condition is critical. In our opinion, the U.S. government is at least one year behind U.S. corporations. [!]** We consider the official estimate of $2.3 billion to fix the problem to be laughable, and we believe the cost will almost certainly increase substantially as more thorough assessments are completed. **The General Accounting Office has estimated $20-30 billion in total Federal costs, which may still be low**, although it is probably more accurate. In either case, progress has been slow by continuing bureaucracy, archaic technology, and competing priorities. **There are significant concerns that the government will not be able to fully address the problem by 2000.**"—*J.P. Morgan Research Department, "The Year 2000 Problem."*

Here is something to think about:

"I have recently learned from multiple sources that Vice President Al Gore recognized 18 months ago that Y2K was a serious problem. As the technology guru of the Clinton Administration, he wanted to 'come out of the closet' and take on the issue.

"The Democratic National Committee and the White House, however, told him to keep quiet because there was no discernible political gain to be derived from Y2K. Gore, loal party man that he is, naturally obeyed—even though he knew it was not in the national interest to do so."—*Jim Lord, "How Could They Be So Dumb," Year 2000 Survival Newsletter, November 1998.*

Don McAlvany is well-versed in the extent of teh Y2K problem confronting us. Here is his view of the strange silence in the Clinton Administration on the subject:

"Political considerations are driving the government's response to Y2K. The federal government under Bill Clinton seems to have one primary goal with respect to Y2K—and it is not to fix the problem. It is to keep the public in the dark as long as possible and prevent a panic. The great fear on the part of the Establishment is that the public will panic and stamped to acquire groceries, preparedness items, and cash.

"They are terrivied of a bank run and a run on the stock mar-

ket, and would rather keep the public in the dark up until the last minute rather than chance a financial panic and collapse. However, as the reality of the Y2K breakdowns begin to hit home, the panic will be even worse than if the public had been properly informed and encouraged to prepare."—*Don McAlvany, March 9, 1999 newsletter.*

It was not until February 1998, that President Clinton decided to appoint an agency to deal with the problem! He appointed John Koskinen as Y2K Czar. Sine then, Koskinen has written letters appealing to departments and businesses to get ready, and he has testified before numerous committes and panals. So he is accomplshing a lot, if talk accomplishes much.

Congress has placed $3.35 billion into an emergency fund available to federal agencies for Y2K problems. But officials agree that time and skilled manpower is lacking to fix the problem in time.

Well, are you ready for it? ***Here is the report card on the U.S. Government, as of June 1998****. It is going to get a failing grade. And all America will be the loser:*

"There are two little black clocks in **John Koskinen's office inside the White House complex**. They display not the time of day but how much time is left until the Year 2000. Time is something Koskinen desperately needs more of. He's in charge of making sure the U.S. government's computers don't crash come Jan. 1, 2000.

"Koskinen's task is not just daunting; it's impossible. **The feds own roughly one-quarter of all the computers in the U.S. The Pentagon alone has about 1.5 million machines—and it keeps discovering more. At last count, at least 4,500 of the government's most vital systems still needed to be repaired.** And the studied silence of President Clinton and Vice President Gore on the subject isn't making it easier to raise the alarm. **'This is not a technical problem,' Koskinen says. Right. It's a people problem: getting top bureaucrats to listen to him.**

"**So far it hasn't worked.** Last week Representative Steve Horn, perhaps the most Y2K-savvy Congressman, gave Uncle Sam's software failing grades. 'Under Koskinen,' the California Republican growled in a voice that could give anyone what-if nightmares. Government performance has fallen from a D minus to an F.'

"**At current debugging rates, 13 of the 24 largest agencies won't have fixed their most crucial computers in time. Among them:**

"***The Federal Aviation Administration:*** **The FAA has plans to ground planes if its air-traffic system isn't repaired—and it may**

have to carry them out. The government's own accountants complained earlier this year that 'at its present rate, the FAA will not make it.'

"***The Department of Transportation:*** **The DOT, meanwhile, flunked Horn's report card for its laughably poor efforts to overhaul its 630 most critical systems, which the agency says will be complete, oh, by sometime in 2004.** Still, FAA Y2K chief Ray Long insists that air traffic is a top priority, and 'there's no doubt in my mind that we're going to meet our [Year 2000] deadlines.'

"***Internal Revenue Service:*** The good news is that **the IRS may not be able to process your tax returns.** The bad news is that it won't be handing out refunds either. Since last fall, says newly installed Commissioner Charles Rossotti, the agency has upped estimates of its Y2K costs repeatedly, from $250 million to $850 million to more than $1 billion. **It fell behind its own deadline of having 66 of its 127 most vital systems fixed by January 1998, and still hasn't finished deciding which minicomputers, file servers, and PCs need debugging.**

"***Financial Management Service:*** Even if the IRS gets fixed, Social Security, Medicare, Medicaid, and veteran benefit checks come from the Treasury Department's Financial Management Service, **a little-known agency through which almost all the government's payments and collections flow. It's in poor shape. As of March, FMS hadn't finished even the preliminary step of deciding which systems needed to be repaired.**

Social Security Administration: This is one of teh most Y2K-compliant agencies in the federal government. **But, unfortunately, although it keeps track of its records, the Social Security Administration does not write the checks. They are sent out by the Department of the Treasury, which will not be prepared until the year 2004.**

"**What nobody, not even Koskinen, knows is how bad the crash will be.** So why doesn't he press the panic button during speeches and interviews? 'Would we do better if I stood up tomorrow and said this is a national crisis?' He asks in reply. Probably not. But it might get the bureaucrats' attention."—*Time, June 15, 1998.*

The IRS alone has 100 million lines of code in 50,000 applications to correct! It has assigned 300 programmers to do the job. That is more than 333,000 lines of code per programmer.

The IRS is just beginning to train some personnel in how to assess the extent of the problem. Yet assessment is less than 5% of the total repair problem. Not long ago, it installed a $4 billion upgrade to its computer system, of which Y2K was supposed to

be a big part. But the entire upgrade failed and had to be scraped! With new tax laws going into effect which require major reprogramming, there is little time to deal with the Y2K bug—especially since IRS programmers are quitting, so they can work elsewhere at much higher wages. Expect serious problems to develop in the IRS.

> "They [the federal government] have earned an 'F' because their progress is slowing down rather than speeding up."—*Rep. Steven Horn (R-CA), chairman of the House Technology Committee, June 2, 1998.*

At about the same time, Rep. Constance Morella (R-MD), chairwoman of a committee investigating the Y2K problem, told a special hearing that the Y2K problem is an impending catastrophe. Horn added that, while slow work was being done on a ferw thousand mission-critical systms, another 60,000 governmetn computer systems will eventualy have to be fixed, along with uncounted millions of embedded computer chips.

Here are several statements worth considering:

> "Congressional committees were told recently that only about 35% of the more critically important federal government systems have been fixed. The committes were also told by the General Accounting Office that it is unlikely that even the remaining 5,000 'missions-critical' systems can be corrected in time. And, of course, with the interdependence of so many programs and systems , those 5,000 essential systems that are priority fixes may be multiplied exponentially. There are about 60,000 'non-mission-critical' systems that also need saving. Defense is not expected to be finised with the needed repairs on its existing 'mission-critical systems until 2009. Former defense secretary Caspar Weinberger and chairman of Forbes's magazine, Forbes, 4/20/98 : 'The Federal Government faces an ugly situation if it does not step up efforts to correct the Year 2000 programming error in its agencies' computers . . Each agency should have a plan in place to deal with the problem. In 1999, all critical systems should be tested. If this is not done, the government has no chance of meaningful compliance' "—*Andrew Grove, CEO of Intel, quoted in Washington Post, April 24, 1998.*

> "Nobody seems willing or able to say it in simple language, so let me be the one: the federal government is not going to finish its Y2000 project. No maybes, no ifs, ands, or buts. No qualifiers, no wishy-washy statements like 'unless more money is spent'

or 'unless things improve.' We're not going to avert the problem by appointing a Y2000 Czar or creating a National 2000 Commission.Let me say again, in plain English: The United States federal government will not finish its Y2000 project. 'How Washington expects to continue functioning after 1/1/2000 is a mustery to me. How American socienty expects to continue operating in a 'business as usual' fashion, when half of the federal government agencies stop functioning, is a deeper mystery and one for which we must all begin planning. All of this is so mind-boggling that it falls into the category of 'thinking about the unthinkable' . . Realistically, we can no longer talk about what might happen IF Washington fails to fix its Y2000 problems. Realistically, we have to start talking about what will happen when the Year 2000 problem brings the government to its knees."—*Ed Yourdon, Timebomb 2000.*

"The federal government faces a signifcant risk of critical of critical computer breakdowns because some Cabinet departments are having trouble speeding up the pace of their repair work on the year 2000 glitch, according to internal documents obtained Tuesday. Between Feb. 15 and May 15, the government finished fixing only 5% of its 'mission critical' systems, according to recent department reports submitted to the Office of Management and Budget and obtained by the Washington Post. As of May 15, more than 60% of the critical computer systems still had not been fully repaired. The government's pace of repair work has alarmed many computer industry analysts and has comeunder attack by Republicans on Capitol Hill, such as Rep. Stephen Horn (R-Long Beach), the chairman of a House subcommittee that has been examining the Clinton administration year 2000 efforts. Horn asserted Tuesday that the current rate of repairs means that more than 40% of the critical systems will not be fixed by the March 1999 deadline set by the White House. 'We need to prioritize and recognize this as a major emergeny,' said horn, who cited the 'disturbing slowdown of the government's rate of progress' in issuing a report card Tuesday that flunked the administration on its date-conversion work."—*Washington Post, June 3, 1998.*

"Speaking on the condition that his name not be used, one of the top five federal agencies would be ready by the deadline of one second past midnight Dec. 31, 1999. At the present rate, this expert said the Department of Energy will have completed the fix in 2019 and the Defense Department in 2012."—*Arnaud de Borchgrave, Washingoton Times, April 3, 1998.*

The following government agencies are far behind in their Y2K

preparations. All of them received an "F" from Rep. Horn's committee:

The Department of Transportation.
The Department of State.
The Enviironomental Protection Agency.
The Department of Energy.
The Department of Health and Human Services.
The Agency for International Development.
The Department of Defense.

Here is another list of when certain government agencies will be Y2K compatible:

Justice Department (including FBI) - 2001.
Health and Human Services (including Medicare and Medicaid) - 2001.
Treasury Department (including IRS) - 2004.
Agriculture Department (including food stamps and farm subsidies) - 2005.
JDepartment of Tarnsportation - (including the FAA and air traffic control system) - 2010.
Department of Defense (including the Army, Navy, etc.) - 2012.
State Department (which issues passports) - 2019.

THE DEPARTMENT OF DEFENSE

This problem is so serious that it requires special attention:

"What does it mean to have one-third of our mission critical defense systems working in 2000?"—*Jim Lord, Year 2000 Survival Newsletter, March 31, 1998.*

Let me begin by telling you a story:

"A preview of possible military disasters was the incident in the 1991 Gulf War, when a Scud missile blew up a barracks in Saudi Arabia, killing 28 National Guard troops inside. A postmortem .....

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.....another says it is 2000, they can't talk to each other."—*Boston Globe, June 21, 1998.*

That bears repeating: "Systems genearlly require time-synchronization in order to talk to each other . . So, if one computer says

it is 1900 and another says it is 20000, they can't talk to each other." This helps clarify the problem soon to hit our military.

When Ed Yardeni and John Koskinen were interviewed by CNN on Y2K on September 18, 1998, they both agreed that **the number one Y2K problem which America faces is its non-compliant Department of Defense, which by the turn of the century will only have about one-third of its mission critical systems Y2K compliant.**

Yet the Department of Defense did not even become aware of the Y2K problem until 1995!

With the world's largest payroll and an arsenal of air, land, and sea weapons dependent on computers, the Pentagon (which will sepnd over $10 billion on Y2K remediation efforts in the final 18 months before the century ends) is hopelessly behind. Rep. Horn's committee estimates that the DOD will not be ready until 2012.

In the third quarter of 1997, the DOD reported that it had 25,054 affected systems and only 3,143 mission critical. Sounds pretty good. A lot of checking must have gone into such exact numbers. Then, on June 12, 1998, Rep. Steven Horn's Y2K Committee disclosed that the DOD had falsified those numbers, and the number of actual repairs which had been made.

The same month, the Office of Management and Budget (OMB) issued a report for the quarter ending May 15, 1998. The report revealed that the Department of Defense, Veterans Affairs, and Interior have all slowed in their efforts to fix their Y2K problems in the last three months. The detailed report outlined progress at 24 federal agencies.

Here is another comment on the situation:

> "During Bill Curtis' 27-year career as a military computer programmer, he wrote more than a few lines of code that were century-insensitive. 'I made decisions that we could use two digits for the date,' he confesses. Now, as the head of the Department of Defense's Y2K office, Curtis is in charge of fixing his own—and everyone else's—software problems. It's a job nobody else wanted. **Although the Pentagon began Y2K planning in 1995, repairs of the most vital computer systems were only 9% complete this spring. The F-15 and the Navy's Tomahawk missile are two of 34 as yet undebugged weapons systems cited in a report scheduled to be released this week. When pressed, Curtis admits that even the military's most 'mission critical' systems—per-**

haps 2,800 in all—won't be ready in time. Officials insist that America's nuclear arsenal is more or less fail-safe, which means that if the computer systems go haywire, the missiles won't launch. **Whether the same is true of Russia's nukes is an open question."**—*Time, June 15, 1998.*

"The Defense Department recently received a letter grade of F and is projectd to have only one-third of its essential computing systms working properly by the Year 2000. This is nothing less than scandalous . .

"Each Tomahawk missile has embedded computers that use identical software. If this software has a Year 2000 defect, the softeware engineers must correct the problem only once and then replace the bad softesre in each missile. fi this step is not taken, of course, the military would lose the capability to perform the speicfiied mission becuase thosnads of missiles woud be rendered useless by the malfunctioning software. When it is reported that Y2K repairs to a mission ciritical system wil not be completed by the deadsline, it means tahta ll individalu copies of that system will beocme defective and the fundamental mission capability will be lsost or impaired. In th cawes of JTomahawk, thousands of individual missiles would become inopeative and the ilitay would no longer be able to destroy land-based targest with missiles form 1,000 miles away. The Horn Report Card projes stha nearly 3,000 mission critical systems thoughthe governmetn wil not be ready for the Yea 2000. Nearly 1,800 of these are military systems. This is, of lcourse, a catastropohic loss of military capability that would likely render the American military a helpless giant."—*Jim Lord, Year 2000 Survival Newsletter, March 31, 1998.*

In April 1998, the General Accounting Office (GAO) issued an ominous report on the Department of Defense.

"Authorities are investigating whether the nation's strategic defense computers could malfunction because of the millennium bug. Some military computers are almost certain to fail after the clock strikes midnight on Dec. 31, 1999, said John Stephenson, who heads the study by the General Accounting Office, the investigative arm of Congress. In an April 30th report to Congress, the GAO warned that time is running out to protect the military's 1.5 million computers. What you hope is that (defense officials) will start to apply triage, Stephenson told the Rocky Mountain News. They should decide what their most important missions are and which systems support those missions and fix those first. A top GAO

priority is the North American Aerospace Defense Command in Colorado Springs, a facility that monitors Amaerica's nuclear defenses. The installation at Cheyenne Mountain is the linchpin of stategic forces. Its computer-powered equipment can detect incoming enemy missiles. The GAO also may review the satellite relay stations at Buckley Air national Guard Base in Aurora. Those facilities track missile firings and nuclear explosions. We are looking at NORAD in terms of the intergrated tactical attack assessment system, said Yvonne Vigil, an evaluator in the Denver region GAO office. Describing the complicated NORAD facility as the system of all systems, Bigil said NORAD's computers must be bug-free because their mission is to protect and safeguard the United States. Perhaps the most critical area is the military, in which many old systems called legacy systems still play major roles. The software coding is so archaic that finding the sections calculating dates is difficult. A congressional committee estimated in 1996 that the Department of Defense's Glogal Command Control System failed when the clock was pushed ahead to the year 2000. Deployed at 700 military installations worldwide, the system is the key tool in battle management and planning. Other vulnerable systems include the Global Positioning System used for determining a military unit's exact location and for the precision targeting of smartweapons. Most (if not all of America's missiles are guided to their targets using the GPS system. Other military communications systems could be compromised. Even on-board computers in jet fighters will be tested, the GAO report said. The report slammed the Department of Defense's handling of the millenium bug. problem. The Pentagon did not have a complete inventory of its computers, was wasting too much time trying to fix noncritical systems and had inadequate contingency plans if important systems crash, the report said. They've designated 2,900 mission-critical systems and 25,000 nonmission-critical systems, Stephenson told the News. But if you look at the statistics, (the systems) are being repaired at about the same rate. So what's the point of designating 'mission critical' if it doesn't mean you focus your resources and priority on those. The more they get into assessment of this, they're finding it's more insidious than first thought, the GAO's Stephenson said. The GAO reports over the past two years on the military's 2000 problem have steadily increased in their alarm. In the April report, the GAO warned bluntly that failing to quickly fix the prob-

lem would mean computer failures that are widespread, costly and potentially disruptive to military operations worldwide. All the federal reports that we do will ratchet up without trying to crate panic, Stephenson said. We're becoming increaingly concerned. Some of the big sector institutions like banks are ahead of the federal government. The Department of Defense is peculiarly vulnerable to this problem because it has such a grotesque set of legacy (older) systems, Stephenson said. It has an awful lot of systems that have been around for an awfully long time. Though computer systems at NORAD's Cheyenne Mountain installation are being upgraded, some military machines still calculate dates in archaic computer languages that are no longer in use. Many porgrammers who wrote the code have retired or adaped to more modern computer languages. Reviewing tens of millions of lines of military code to find the exact coding for dates and time is intensely time consuming. It is a great steaming heap of spaghetti code which means that it works byt nobody knows why anymore, Pike said. And nobody wants to look too closely for fear that they might break it. When they go in there to start looking at the code, it urns out that half the code doesn't even execute any more."—*Rocky Mountain News, May 10, 1998.*

It is obvious that a very real danger exists. The enemies of America are many, and very soon our military has going to have an opportunity to attack us during a time when there is a major blind spot in our defenses.

"U.S. Navy operations worldwide could be severely disrupted by .....

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..... destroyer deckplates as well as shore infrastructure."—*Orange County Register, September 1, 1998.*

COMPUTER THEFTS AND CYBERATTACKS

While on the subject of our military defense and the Y2K situation, there is a closely related problem which should be briefly considered:

First, during the time that the Y2K bugs are being fixed, the computers are open, and foreign agents could enter them:

"CIA diretor George Tenet warned that the Year 2000 problem could help .....

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..... is the biggest target and defense against cyberattack is still in its infancy."—*Year 2000 Bug Poses Security Risk," USA Today, June 25, 1998.*

"Over the last three weeks, a new group .....

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..... downplayed the significance of teh break-ins."—*Los Angeles Times, May 4, 1998.*

Second, we mentioned earlier that there are not enough programmers to rectify our Y2K computer problems. In order to alleviate this problem, our government is hiring many foreigners to fix our computers. We have changed our immigration laws to allow 90,000 computer programmers to immigrate to this country in 1998. There is serious concern that foreign spies could enter and copy information while they are working on Y2K programming.

THE GLOBAL POSITIONING SYSTEM

This is a complicated subject, but I will try to simplify it.

Military ships, aircraft, and ballistic missiles have guidance systems to help them locate where they are and where they should go. For at least 30 years, the U.S. used gravitational maps for this purpose. These are minor fluctuations in earth's gravitational field, found throughout the world. Both America and Russia used such maps for military guidance earlier, and Russia still does.

Very soon, for the first time since shortly after World War II, the U.S. will not longer be able to respond in teh envent of a Russian nuclear attack. Here is why:

We now use the global positioning system (GPS). It uses satellites and special, very accurate clocks for this purpose. There are 24 NavStar sattellites, which receive signals from the Primary Standrads Clocks at the Naval Observatory in Washington D.C. They provide precise navigational signals for receivers to plot their positions from.

In the late 1980s and early 1990s, the Defense Communica-

tions Agency (now called Defense Information System AGency [DISA]) upgraded their system from the older LORAN-C models to GPS synchornized networks. These networks are capable of moving immense amounts of data and voice communications with great accuracy—to any location in the world, even inside a submarine or deep in an underground missile silo.

Without this new system, the U.S. government will find it nearly impossible to coordinate large-scale battle plans. *On August 22, 1999, the GPS satellite system's clocks will rollback 1024 weeks, make glboal network synchronization impossible.* The effects of this failure cannot be overestimated.

(It should also be mentioned that the GPS is used for civilian usage, including the banking system. It is believed by banking experts that, on August 22, 1999, a worldwide depression may begin. Time will tell. The banking system requires communication between banks and central banking institutions.)

While the world watches Y2K, the vulnerability of the GPS is overlooked.

In April 1996, the government awarded Boeing a $1.3 billion contract to repair the GPS—and make it able to continue on through the next century. *Boeing now says that it cannot complete its repair work on the GPS until December 1999.* That is a full four months without the GPS.

It is reported that the U.S. arsenal of guided missiles rely on GPS to guide them. But, beginning August 22, the GPS will only provide erroneous data.

In December, the new IMOSC (Integrated Mission Opoeratoin Support Center) system is slated to be completed by Boeing.

The Russian system of gravitational mapping will be fully functional until 2000, when their system will no longer operate correctly (due to the Y2K problem). Even the Russians know their nation is crumbling. Some believe that if Russia wanted to regain its power, this four-month window of U.S. ballistic missile blindness would be its last opportunity. (Most of the NATO countries in Europe have converted to the GPS system also, so they would also be blinded for several months.) For four brief months the balance of power will tilt fully in Russia's favor.

What is the likelihood of all that happening? One could say that we really do not know. However, we know that Russia will not rule the world. According to the book, *Great Controversy,* the United

States of America will be the leading world power at the end of time; and no one else. God is in charge, and will care for His commandment-keeping people.

U.S. STATE AND LOCAL GOVERNMENTS

Here is what J.P. Morgan says about the status of U.S. state and local governments:

"***State and Local Governments:*** Condition is critical. Although often overlooked by industry estimates, state and local governments are at serious risk for Year 2000 nightmares. According to the General Office, only 25% of state and local governments will be ready by 2000. The national Association of State Information Resource Executives' Year 2000 working group surveyed the states and found some disturbing results:

"1. **Only 30% of state chief information officers said that their states were in the implementation or testing stage of the Year 2000 fixes and only 54% even know how many lines of code need converting. One-quarter do not have an estimated completion date, and 45% had not completed a cost estimate.**

"2. **New York has budgeted only $50 million for Year 2000 compliance, which the director of the state's task force described as 'nowhere near what we will need.'** A few other states have also set aside budget dollars, mostly in the low tens of millions range."—*Ibid.*

— OVERSEAS —

FOREIGN LACK OF PREPAREDNESS

We earlier reported that governments and businesses in a majority of other nations are far behind in adapting their computers for the turn of the century. Because of this, catastrophic conditions will occur overseas at that time. However, because the entire world is now so closely linked together, foreign problems will quickly affect us.

"The millennium bug isn't just an American problem. The United Nations wants its members to forge global alliances to help stamp out the glitch.

" 'There truly is no time to waste,' said Richard Sklar, a U.S. official at the United Nations. He warns that countries that fail to act are risking serious disruptions from malfunctioning computers.

"The United States, Britain, Canada, and some other countries have devoted millions of dollars to preparing for 2000. Experts say other countries, including Germany, Japan, and Russia, are way behind and due for a shock if computer systems lose track of time . .

"Even if the United States fixes most of its bugs, the global economic system could still shake because of other countries' problems. Many world leaders are too busy with the Asian financial crisis or the new single European currency to worry about the year 2000 problem . .

"Edward Yardeni, who himself called for a world war against the bug, now estimates a 70 percent chance that the bug will set off a global recession. The economist says the downturn will be at least as bad as the 1970s oil crisis.

" 'If we have everything fixed in the United States but there are major disruptions in Europe and total calamity in Asia and Latin America, we're going to be affected in a very, very adverse fashion,' says Mr. Yardeni, chief economist for the international banking firm, Deutsche Morgan Grenfell . .

"Capers Jones, chairman of Software Productivity Research, estimates the global cost of repairing software at $1.1 trillion."—*World, July 18, 1998.*

The problem is not being taken seriously in most nations of the world. Europe is trying to some extent to wake up to the danger. Asia is almost completely unprepared. Latin America is worse. In Russia, three oout of every five businesses have never even heard of Y2K.

"The government is drawing up urgent plans to prevent a millennium nightmare in which the start of 2000 is marked by power failures, flight problems and hospital diasters triggered by mass computer malfunction."—*The Sunday Times, London, February 15, 1998.*

Oil refineries all over the world are lagging badly in Y2K repairs and most will not be compliant by the end of teh century. Rep. Horn's Congressional Y2K Committee found that three out of fiv refineries in Venezuela will shut down. Those refineries are pri-

mary sources of refined petroleum products, incliding gasoline, for the American market.

> "Oil producers, such as Venezuela, Saudi Ariabia, Mexico, Nigeria, Angola and Gabon, lag in Y2K repair efforts. Oil production remains largely in the hands of multinational corporations, but the industry appears exposed to potential Y2K problems becuase of its heavy reliance on embedded microprocessors in oil drilling, pumping, precessing and refining. We are concerned agbout the shiopping of oil products, because ocean shipping and foreign ports have both been flagged as among the least prepared sectors."—*Lawrence K. Gershwin of the National Intelligence Council, quoted in the Washington Post, January 21, 1999.*

> "I have a lot of reservations about whether any of the national or international oil companies wil be ready for the Year 2000. Five years ago many oil companies trimmed their staff to try to boost profits. They lost a lot fo good legacy people tht way. And now when they need thta expertise, they don't have it."—*Dan looper, Y2K maanger at Litton PRC.*

In England, so great is the concern about interruption in energy supplies tht the government and businesses are encouraging employees to get bicycles or mopeds.

On March 5, 1999, Jacquelyn Williams-Bridgers, the Insprtector Genreal of the Department of State, testified before the Senate Sepcial Committee on the year 2000 Technology Problem.

She stated that, with hardly an exception, developing nations (outside Europe, America, Canada, Australia, New Zealand, and Japan) are still only thinking about solving Y2K. They do not have the money to do more.

The entire report is 12 pages long and filled with details and examples, showing that none of the nations of the world will be ready when 2000 arrives. Here are a few quotations:

> "In one European country, the government did not recognize the seroius nature of the Y2K problem and had yet to establish a formal Y2K budget. In addition, governemtn officials in this country were not willing to provide detailed information on their Y2K efforts.

> "In another European country, which expects a huge influx of tourists for millennium-related celebratoins, the governt hasd established aY2K committee in August 1998, but did not hold the first meitng on Y2K until January 1999.

> "In yet another European country, thye Y2K issue was viewed

as as techinical problem by the government and was given low priority. Public apathy was widespread and no government leaders were willing to take up the issue.

"According to embassy reports, a number of middle eastern countries are at risk—not only becuse of possible disruptions in the oil industry—but becaus of possible Y2K problems in their desalinization plants. These countries recieve most of their fresh water from desalinization plants, and would aface grave survival problems if the plants lost power or encountered significcnt Y2K failures in their own systems."—*Jacquelyn Williams-Bridger, State Department Review of World Readiness, March 5, 1999.*

The facts continue on and on in this report. African nations, Asian nations, all the nations. Trouble is brewing; big trouble.

FOREIGN NUCLEAR PLANTS

More than 80 nuclear plants have gone on line since 1973, and they account for 40% of the increase in U.S. elecrrciyt demand sind then. More than 30 other nations rely on nuclear energy for a poriton of their electircity supply. In 1996, the 442 nuclear power plants operating int he world genrated one-sixth of the total electricity produced on the planet. Western Europe depends on nuclear energy for about 42% of its electricity. Japan is at 35%. East Asia is at 17%.

You will recall that, in an earlier section on "nuclear power," we discussed the fact that it requires electricity from outside a nuclear plant—to cool its core, and six months is required for it to cool down. Otherwise there could be an explosion.

Intelligence sources declare that some of the 65 Soviet-made civilian nuclar power plants are likely t malfunction when their computers go crazy in January 2000. Twenty-nine of those Soviet reactors are in Russia, and 11 of them are similar to the Chernobyl reactor design. As you may recall, Chernobyl released 200 times as much radioactivity as the atomic bombs at Hiroshima and Nagasaki. Other former Soviet block countries have 36 more reactors. Many are believed to be unsafe.

There are severe shortages of computer experts in Russia to work on the Y2K problem. If any of their reactors fail, the fallout could affect large areas of Europe and Asia.

Keep in mind that several Soviet-made, Chernoby-type reactors are in Cuba

RIOTS / AND / GOVERNMENT TAKEOVER

What are the implications if the power grid goes down? This has actually happened in several cities over the past decade, due to local storms. However, these crises generally lasted only a few days and then the lights came back on. Although there was some looting and a temporary increase in crime, yet food supplies were not interrupted. Welfare checks did not stop. The banks were back open in a few days.

But what would happen if there would be a total shutdown in one or two of our major cities, which lasted for a week, two weeks, a month?

What would happen if the darkness and lack of phone service extended to nearly every city in the nation, and all the towns and rural areas as well?

Something to think about. Something to prepare for.

No more lights, heat, traffic lights, banks, ATMs, public transportation, subways, elevators, airports, groceries or other supplies on store shelves. No refrigeration. No running water. No way to call the police. But lots of news stories on battery radios about the extent of the problem, the growing wave of crime, the roving bands, the riots, and the frenzied, confused comments of public officials on all levels.

If the crisis lasted more than a few days in New Yrok Atlanta, Houston, Los Angeles, Newark, martial law would be delcared—as it was in Los Angeles in 1992.

The crisis would begin in teh dead of winter when temperatures in many parts of the country fall below zero. Winds, freezing blasts of wind, an eirie [sp?] silence. Only a few vehicles still operating. No one able to get the gasoline out of the tanks at service stations.

People huddled together in the dark. No heat, dwindling food, Unpleasant sounds outside in the streets.

No, it will not happen. Yes, it will. Who knows?

It would be well to prepare now for what may come.

For, I assure you, something is coming. Something you will never forget!

In this book, we have learned that the computer experts, po-

litical experts, financial experts, government experts, and corporate experts believe serious trouble is ahead. You and I are not experts, but it would be wise for us to listen a little to what those-in-the-know are saying.

Some fear that the possible turmoil and riots could be used as an excuse for Bill Clinton, using those dangerous Executive Orders, to take over the government,—with the possibility of eliminating the November 2000 elections.

The concept even surfaced on a recent Focus on the Family radio broadcast. A Y2K expert was speaking to the others on the panal, and this is what he said:

> "There could be anarchy, and strong leaders always raise on the heels of anarchy. And this, if this is as global as Yardeni seems to emphasize, then its not just a national problem.
>
> "But refocusing on our own national situation: we hadn't talked about it [earlier on this broadcast], but, as long as your opening this Pandora's box, there are people in jWashington who ahve the fear that we won't have elections in the year 2000. Becuase the administration presently in power will not overlook the opportunity to exploit this politically. We've talked about Y2K technically. We've talked about the implications broadly, economically; but the ones which worry me the most are the opportunities for political exploitation . . [He mentions the little-known fact that the lists of registered voter rolls are on computers, and elections cannot occur if they cannot be accessed] . . What worries me are the Executive Orders, the powers that are available to the chief executive are absolutely staggering to read through. And all that's required to invoke those is a stroke of his pen."—*Focus on the Family radio broadcast, early spring, 1999.*

DARK SIDE OF - North, p 4 under Electricity

MORAL DECAY

There is so much corruption in our nation and in our world, on all levels, that we seem to be as much a moral cesspool as it was in the days before the Flood.

The only hope is to individually seek God, while there is time. Times of great crisis are opportunities for repentance. This is opportunity before the world in the coming months.

— CONCLUSION —

FINAL APPEALS BY YARDENI

So we are faced with a crisis. Many computers will be fixed. Many more will not. It will be interesting to see what happens when the end of the century rolls around.

Dr. Edward Yardeni, chief economist at Deutsche Morgan Grenfell, appeals to governments and businesses to accept the fact that we are on the edge of a crisis—and work vigorously to solve it.

His 21-page report was written on June 10, 1998. After a brief, pointed, list of reasons why the economic situation is dangerous now and for the next decade, because of the Asian financial crisis, **Dr. Yardeni concludes that this problem, compounded by the Y2K crisis, could thrust America into a serious recession or worse.**

"**Let's stop pretending that Y2K isn't a major threat to our way of life. There is too much at stake for such uninformed wishful thinking. Perhaps, the time has come to act as though we are preparing for a war.** This may seem extreme and unnecessary. However, if we prepare for plausible worst-case Y2K scenarios, then perhaps we can avoid at least some of them."—*Dr. Edward Yardini, "Year 2000 Recession?"*

"**The editors of the *Wall Street Journal* clearly showed that they understand the gravity of Y2K by publishing my keynote speech to the Year 2000 Roundtable at the Bank for International Settlements in Basle, Switzerland,** in their May 4, 1998, issue. In my speech, I said that I am a Y2K alarmist. However, I am definitely not a doomsayer.

"**My goal in sounding the alarm is to increase awareness of the enormous risks that are lurking in Y2K. Unfortunately, doomsday scenarios are in the realm of the possible, especially if we fail to seriously assess the risks immediately.** However, it is not too late, in my opinion. We can still take actions to avert them . .

"If you think I'm an alarmist about Y2K, consider the following from the Commish himself. Yes, **here is what the Commissioner of**

the IRS told the ***Wall Street Journal*** **(April 22, 1998) about Y2K:**

'**There's no point in sugarcoating the problem. If we don't fix the century-date problem, we will have a situation scarier than the average disaster movie you might see on a Sunday night. Twenty-one months from now, there could be 90 million taxpayers who won't get their refunds, and 95% of the revenue stream of the United States could be jeopardized.'**

"If you think I am overly alarmed, consider this: **When asked about Y2K, Ralph J. Szgenda, the chief information officer of General Motors, told *Fortune* (April 27, 1998) that there are 'catastrophic problems'** in every GM plant. I called the reporter to verify this shockingly blunt quote and was informed that the word 'catastrophic' was repeated several times during the interview with GM's top IT man. (**In 1997, when Chrysler Corp. turned all the clocks to December 31, 1999, at its Sterling Heights Assembly Plant, the security system shut down and wouldn't let anybody out.**)— *Detroit Free Press, April* 23, 1998."—*Ibid [italics his].*

Surely, we have been warned to be cautious in these last days. Satan will devise many ways to entangle us in difficulties, so we cannot do the work which God has assigned us individually. It is our prayer that this information may help you avoid needless problems in the days ahead.

CRISES ARE COMING—We received the following letter from a friend a few months ago:

"As you know, besides the Sunday Law Crisis, there are two other cmajor crises on the horizon. Both are growing more serious with each passing month. These two crises are:

"(1) The Y2K Computer Crisis. No one knows with any real certainty how much confsion, disruption, and upheaval this crisis will inflict on American society and on the societies of other countries around the world after 1 January 2000. Estimates range from a mild disruption to a massive, serious crisis. No one knows for sure how many difficulties htis crisis my cause people when they go to buy or sell. Although efforts to adjust and reprogram computer systems are speeding up,, no one can be sure if all of the necessary reprogramming will be finished by 1 January 2000.

"(2) The growing economic crises in Russia kand in the Pacific Rim countries like Japan, South Korea, Indonesia, and Malaysia. Thse crises began about a year ago and have simce

grown deeper and wider.

"The International Monetary Fund is seriously depleted as a result of trying to stabilize these Asia economies. In addition, massive unemployment is crippling many of the Pacific Rim countries, not to mention Russia.

"All of thes economic woes will not stay on foreign shores forever. the day will likely come when these foreign economic crises finally affect the American economya nd slow it down, and maybe even cause a dserious depression here.

"In light of trhes two looming crises, I believe Adventists should be giving serious thought to some careful planning and preparedness for the stormy days ahead whilel the American economy and society are still reltively stabble, and survival infomriatn and supplies are still avialable and are eaily accessible. My Scriptural basis for this proposal is found in Provebs 22:3: 'A prudent man forseeth the evil, and hideth himself, but the simple pass on and are punished.'

"Once one or more major crises strike America, no one can know with any cetinty what might happen. At the very least, food and fuel supples will problably be disrupted. Very possibly, the crises may produce anarchy, riots, and violenc ein most medium and large cities. At the very worst, the president may declare a National State of Emergency by means of an Executive Order, which could close banks, sotres, and who knows what else—as well as turn America into a dictatorship with very little freedom."—*Northeast, August 31, 1998.*

OUT OF THE CITIES! should be our watchword. OUT OF THE CITIES should be the example we give to others. Heaven's messenger told us so years ago.

GETTING READY—The crisis will begin in January. Know how to keep your family warm, even *without* electricity.

Buy the necessities you need, even if the banks are closed or you cannot get access to your accounts.

Know how to provide emergency protection and medical care, even if 911 is constantly busy.

Be able to feed your family, even if the grocery shelves are empty.

Have clean, uncontaminated drinking water on hand, in case your water treatment plant cannot provide you with any.

A recent article discussed the need to prepare, at least a little bit, for what is coming:

" 'If we're going to recommend people buy gneeators, they'll need to get their orders in soon,' says Mr. [Larry] Burkett. 'Already, most manufacturers are backlogged. If you call to order long-term food storage supplies, you'll find yourself on a waiting list. A warning is no good if it's given too late to do anything.' . .

"Sen. Robert Bennett (R-Utah), who chairs the SEnate Year 2000 Committee, told the National Press Club on July 15, 'It might not be a bad idea to have a little extra food and wtaer around in case the supermarket can't get its stock for 72 hours or a week or two because of breakdowns in the transportation system.'

"What's significant about that statmeent, Mr. Burkett sys, is that it's the first indication, form a top govetrnment official, tht stocking up on food and water is a good idea . .

" 'What can you do now? Lots of things,' he [Burkett] says. 'At the very minimum, have hard copy records of your taxes, your savings, your investments, your Social Security benefits. You might have to reconstruct those. If the Social Security system fails, for example, I bleieve the govetnemtn will require you to prove you're entitled to those benefits.'

"And he [Burkett] echoes Senator Bennett's recommendation on food storage:

" 'It just seems prudent to me to keep some food reserves,' he [Bennett] says. 'It won't cost you much, if you get a few extra cans at a time. If nothing happens, you eat it. And gather some containeers for storing some water. They're cheap. Maybe buy some non-electric lanterns. And do it soon, becuase next year at this time, they're not going to be available.' "—*World, August 22, 1998.*

EVERYTHING'S ALL RIGHT—America believes it is prepared:

"From a CIO magazine survey of 643 individuals for a *Year 2000 Consumer Awareness Study* in May 1998:

"38% admit they're not aware of the year 2000 problem.

"62% know about the problem. Of that number, 50% are not at all concerned about Y2K afecting them personally, and 80% are confident the problem will be fixed before the dawn of the millennium.

"Yet CIO's April 1998 poll of technology and business executives indicated that only 17% were confident the glitch would be fixed in time."—*PC Magazine, October 6, 1998.*

NOT GETTING READY—Some say there is no problem, that everyone is just about ready for 2000 to arrive. I have read such reports; you probably have too. Read this:

"From a survey of 15,000 companies in 87 countries for a July 1998 report:

"23% of all companies have not started year 2000 efforts. More than 80% of these are small companies.

"19% of the companies that have started compliance efforts began face-to-face meetings in 1998 with vendors that provide mission-critical solutions. These meetings were required, because survey letters proved to be an inaccurate assessment method.

"50% of all companies do not intend to perform year 2000 testing, because they plan to fix and install code to production systems."—*PC Magazine, October 6, 1998.*

GOING TO HAVE A PARTY—"President Bill Clinton and Vice President Al Gore say they are building a bridge to the 21st century. Unfortunately, the bridge could collapse just as the new millennium begins—because the administration isn't doing enough to ensure that the Year 2000 Problem won't crack the tchnological foundation of our economy . .

"On February 4, 1998, President Bill Clinton created a *Year 2000 Conversion Council* at the White House to coordinate the government's efforts to head off the problem. Unfortunately, this is a small step . . The president's February 4 executive order limits the council's mandate to overseeing the Y2K-fixing progress of the federal government's *executive branch,* where the effort remains decentralized at the agency and departmental levels.

"Previously, the Office of Management and Budget (OMB) had been in charge of overseeing the progress of federal agencies in fixing the problem. Sally Katzen headed this effort at the OMB's Office of Information and Regulatory Affairs. She had other responsibilities besides monitoring federal Y2K progress. In January 1998, she was appointed deputy director of the National Economic Council.

"The Year 2000 Conversion Council is chaired John

Koskinen, deputy director of the OMB . . Mr. Koskinen's ambitions are limited. He made it very clear, when he was appointed, that he won't be the nation's Y2K czar. He expected to be a 'coordinator, facilitator, and catalyst' to reinforce the independent efforts of the various federal agencies . . 'I'll have a very small staff' [he said.] . .

"He started [a month later on] March 9, 1998, which suggests there wasn't a sense of urgency at the White House about Y2K.

"Indeed, the administration is looking forward to a big party in 2000. Two days before he set up the *Year 2000 Conversion Council,* President Clinton signed an executive order establishing the *White House Millennium Council* 'to recognize national and local projects that commemorate the millennium in a national and educational celebration of our culture, democracy, and citizenry.' "—*Dr. Edward Yardeni, "Year 2000 Recession?"*

It reminds me of Belshazzar, who occupied himself with a drunken party, while the Persians slipped through gates which had been left open. History has a way of repeating itself.

GOVERNMENT REPORT CARD—Good news from Washington! The U.S. Government is getting ready for January 1, 2000! When will it be ready? —*Within six months to 20 years after January 1, 2000!*

Based on current rates of progress, 14 federal agencies report that those of their computers which perform "mission critical" functions will be fully millennium-compatible by the following year:

National Air and Space Administration - **early 2000**.
Federal Emergency Management Agency - **mid-2000**.
Agency for International Development - **mid-2000**.
Department of Education - **mid-2000**.
Department of Justice - **2001**.
Department of Health and Human Services - **2001**.
General Services Administration - **2002**.
Department of the Treasury - **2004**.
Department of Agriculture - **2005**.
Office of Personal Management - **2010**.
Department of Transportation - **2010**.
Department of Defense - **2012**.

Department of Labor - **2019**.

Department of Energy - **2019**.

Hard to believe? The Emergency Management Agency not prepared for its own emergency? The Agency for International Development without its own internal development completed in time? The Office of Personal Management not able to manage its own personal affairs?

For more on this, we refer you to official documents of the House Subcommittee on Government Management, Information and Technology, of the Government Reform and Oversight Committee.

A FEW ARE SOUNDING THE ALARM—On **January 12, 1997**, Senator Daniel Patrick Moynihan (D-NY) introduced a bill in the Senate to establish a bipartisan national commission to confront the Year 2000 Problem. The preamble warned, **"A devastating computer problem will have extreme negative economic and national security consequences in the year 2000 and in subsequent years, unless the Federal government addresses and remedies that problem."**

On **November 10, 1997**, Senator Bob Bennett (R-Ut) introduced a bill in the Senate to require greater Y2K disclosure by publicly traded companies. In his press release, the Senator said, **"The Year 2000 Problem lies at the heart of our economy . . To delay our efforts to address this problem is to be inexcusably reckless."**

In a **March 4, 1998,** press release, Representative Stephen Horn (R-CA) said, **"It is increasingly clear that a large number of federal computer systems simply will not be prepared for the date change on December 31, 1999."**

At a **March 18, 1998,** meeting of a House committee she chairs, Representative Constance A. Morella (R-MD) said, "As we ring in the 21st century, **we will be ushering in the mother of all computer glitches—one which could cripple critical government functions** . ."

As noted elsewhere in this report, in the **April 22, 1998,** issue of the *Wall Street Journal*, IRS Commissioner Charles Rossotti said, **"If we don't fix the century-date problem, we will have a situation scarier than the average disaster movie you might see on a Sunday night."**

In a **May 15, 1998,** memorandum addressed to members of Congress, Steve Forbes wrote this:

"**The Year 2000 (Y2K) computer crisis is now upon us and the federal government is even more woefully unprepared than the rest of society. The implications are ominous. Medicare, the IRS, the Federal Aviation Administration, and other basic agencies are operating on utterly out-of-date technology."**

EVEN IF —

"Even if everyone on our small planet did fix Y2K except for a few key U.S. government agencies, a global recession would still be a plausible scenario. After all, the federal government accounts for a great deal of U.S. economic activity, which, in turn, accounts for a great deal of global economic activity. U.S. federal, state, and local government spending accounts for 17.5% of real GDP [gross domestic product]. This percentage is even higher for most other countries around the world."—*Dr. Edward Yardeni, "Year 2000 Recession?"*

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E-mail message, dated March 8, 1999:

" I received a call from a man this weekend telling me he represented my bank and that they were havng difficulty meeting requirments to be computer ready for Y2K. He said all bank customers would need to transfer their accounts to a bond account specially designed to protect our money until the bank could fully comply with Y2K requirements. He then said that, to verify that he was talking to the proper account person, I needed to confirm informationabout myself: my account numbers and then give verbal authoriziatoin to transfer funds to this speically designed account.

"I don't trust folks who do this kind of thing, so I asked him which of the banks I use that he represented. At this point, he immediately hung up the receiver.

"Please pass this on to friends. This is a scam going all across the country. Fortunately, I have caller-ID, so I told the phone company about it."