What's Behind the

ENERGY CRISIS?

The Western world — especially the United States — is on an astounding energy binge. Authorities are concerned, wondering where we will get the fuel to supply our burgeoning cry for MORE ENERGY. Few, however, ask the most basic questions of all: Should we as a society be so utterly dependent on nonrenewable energy sources? Should we continue to use ever greater amounts of energy?

by Jerry Gentry

"BRNNG . . . brnng . . . brnng" — your electric clock goes off right on time!

You sleepily roll out of bed, and reach for the light switch. Of course, the light comes on just as you expected.

The house is cold. You stumble into the hallway where the heater thermostat is located and adjust the oil or gas furnace to the "comfort range."

You find your way to the bathroom, fumbling for your electric razor. Just a flick of the razor switch is your assurance of a clean shave. Next, comes a shower, and you hurriedly get dressed.

You seldom — if ever — stop to consider: Suppose the electrical power suddenly went off, and *stayed off,* in your home? No, you aren't even thinking of any "energy crisis" as you rush in for breakfast. Your wife has fresh orange juice squeezed in her new electric juicer. The refrigerator has assured your family of milk and eggs, which might have spoiled otherwise. You sit down to your toast from the electric toaster and eggs cooked over your gas or electric range. A cup of piping hot coffee percolated in your electric coffee maker, hits the spot.

A Morning at Home

But what about you, the wife at home?

You begin the household "chores" of washing dishes in the automatic dishwasher.

"What a work saver this is," you think as you tuck away the soiled dishes, and pour in the detergent.

The floors are dirty, and this calls for help. So out comes the electric vacuum cleaner from the closet. The clothes hamper in the bathroom is overflowing, and must be taken care of. Into the automatic washer go the soiled clothes. And no clothesline worries you — an electric or gas dryer does the job.

Stop and consider for a moment.

You have already used some 16 electrical, gas- or oil-fired appliances in the course of just one morning. Actually, Americans have available for use over 200 separate electrical gadgets. These exclude gas- or oil-powered machines such as a lawnmower or the automobile.

One person was recently challenged to compile a list of the electrical gadgets in his home. To his astonishment he found a total of 67 items — nearly one third of those available!

The newest of these mechanical servants is the "garbage crunching" device for compacting household solid waste before putting it in the garbage can. Another is the electrically-heated comb for men, to match the wife's electric rollers.

Our "Mechanical Maids"

To power these mechanical devices, Americans use more than 8 trillion horsepower-hours of energy every year.

Imagine having to stable the number of actual horses necessary to do this much work.

Much of this 8 trillion horsepower-hours is at the immediate beck and call of Americans. Each American has at his fingertips, on the average, the equivalent of the energy expended by 500 human slaves.

This means, according to *Los Angeles Times* science writer Irving Bengelsdorf, that the true population of the U. S. is 200 million people *PLUS 100 billion* energy-slaves, making a total human equivalent of 100,200,000,000 working servants.

This represents the total impact upon the environment. But the noxious wastes from our energy-slaves are far more difficult to deal with than mere human wastes.

Nevertheless, Americans especially continue to develop new energy-consuming gadgets.

The amount of electricity produced to power the gadgets — and industry — was 1.6 trillion kilowatt-hours in 1970. Within a decade, authorities estimate, Americans will consume TWICE the yearly power they presently use.

This trend of a more voracious power consumption has forced utility companies to build increasingly larger power-generating plants. Some are capable of producing at the rate of one million kilowatt-hours or more. A plant of this size gulps 9000 tons of coal each

day. As a result, an estimated 300 million tons of coal were fed into American steam-electric plants during 1970 alone! *Transporting* this vast amount of coal is an enormous task for America's railroads.

Authorities note that *industry* uses about 41% of the U. S. electrical supply; homes and commercial users divide up 49% between them. The remaining 10% is lost in transmission.

Reaching the Critical Point

How critical is the electrical supply? In 1965, history's largest electric power failure plunged 80,000 square miles of America's Eastern Seaboard into darkness. Experts predict more such "blackouts" and "brownouts."

During the 1969-1970 winter, 39 of 181 large U. S. utility companies had less than 10% electrical reserves for an emergency.

And more recently, Britain's 125,000 electrical workers went on strike, plunging huge masses of her population into darkness, curtailing industry, and wreaking havoc with city traffic when street lights failed.

Yet worldwide energy demands, both private and commercial, continue to increase.

Americans alone are expected to demand just as much electric energy in the next 10 years as they did in the preceeding 90 years — a total of at least 18,000,000,000,000 (18 trillion) kilowatt-hours.

Said Dr. Wilson M. Laird, Director, Office of Oil and Gas, U. S. Department of the Interior, in a speech delivered on March 5, 1970: "We are entering a period of growing scarcity in energy of all kinds, and the ironic thing is that we go on acting as though our *supply is endless* . . . gas distributing companies continue to run full-page ads touting their product . . . We continue to build and aggressively merchandise every conceivable kind of appliance that can be attached to an electric power line, including whole-house electric heating requiring three times the expenditure of energy as oil or gas."

Americans are not alone in their voracious appetite for electric power. Other industrial nations are also consuming ever-greater amounts of energy. Canadians and Norwegians, on a man-for-man basis, consume more electricity than do Americans.

Can Americans continue to supply and distribute the growing energy requirements that double every 10 years or less? What effect will this have on earth's complex — and in many ways fragile — ecological interrelationships?

Should we use so much energy? Ought we to reconsider the unrestricted, uncontrolled devouring of nonrenewable "fossil fuels" as our main source of energy?

Where Electricity Comes From

At present the vast majority of our electricity comes from steam-generating plants powered by coal, oil, and natural gas.

From the start of the Machine Age, coal has been the most significant energy source. By 1950, the earth had yielded 80 BILLION tons of coal. Petroleum came into use later than coal. Even so, by 1950 over 70 BILLION barrels of oil had been piped from the earth.

These energy sources, combined with natural gas, provide over 95% of the total energy expenditure (including automobile gasoline) in the United States. Nuclear and hydro-power make up the remainder.

But continually increasing energy demands are putting great stress on production. The problem has not been clearly understood by the public.

"In the first place," said Mr. Harry Perry, Senior Specialist, Environmental Policy Division, Library of Congress, "two out of three of our fossil fuels are in short supply . . . secondly, the fossil fuels are, as is nuclear [energy] in other directions, a detriment to the environment."

Coal, oil and natural gas — which are responsible for about 80% of the electricity produced by our electric power plants — must be drilled or mined, processed and transported to a power plant before electrical energy can be generated. The gigantic task of producing and transporting enough coal for just one electric power plant is staggering. A plant located in the Mojave Desert in the Western United States gulps some 200 railway carloads of coal in just *one day's time.*

And there are literally hundreds of power plants over the United States and Canada requiring such huge coal tonnages. As more and more coal is used up, companies must turn to deeper deposits, veins with less thickness, or deposits hundreds of miles from the generating plants.

We asked Mr. Brice O'Brien, Vice President of the National Coal Association, how energy problems rank today in our list of national priorities. "We have used the cream of the crop, we're running out of that. From now on we're going to have to pay for energy," he warned.

Costs of mining increase, and so do costs for transporting all this coal. Profits disappear. These and other problems are beginning to result in actual coal shortages for utility companies.

T.V.A. Troubles

Tennessee Valley Authority (T.V.A.) is the largest buyer of coal in the United States. In 1969, it purchased 32 million tons of coal. "If you piled it up," James Watson, Manager of Power for T. V. A. told PLAIN TRUTH reporters, "and put it all on a football field, it would reach more than five miles in the air."

T.V.A. has been receiving only about 80% of its coal needs, thus creating a real pinch. During December 1970, when we visited T.V.A., it was down to a 29-day supply. Most utility companies have less than about 30 days' supply, several less than two weeks.

Even though the U. S. exports only 10% of the coal it mines, domestic users are complaining this is too much. In some cases they claim coal companies have cut short their commitments to *domestic* electric utilities in favor of FOREIGN CUSTOMERS *offering* higher prices. Normally, high quality metallurgical coal is exported to foreign steel producers. More recently, Japan has been forced to buy U. S. utility-grade coal for use with other grades of coal to make steel.

Coupled with these problems, the shortage of railroad hopper cars often halts the flow of coal from the fields to the power plants. T. V. A.'s James Watson also commented to us, "We have a shortage that amounts to some-

thing like 100,000 tons of coal a week that we could get if we had sufficient cars." Some steam plants could run out of coal during peak load periods if the supply is not improved.

Some train cars have sat in port for *weeks,* or longer before ships arrived to take coal overseas. And the thought of a railroad workers' strike doesn't exactly put utilities companies at ease.

Strip Mining Devastation

Scrambling to meet market demands and to cut costs, coal companies turn to the method of *strip mining* to supply customers.

The strip mining method is perhaps the most devastating means available for obtaining coal. It accounts for one third of America's 500 million-ton annual output.

Some 3.2 million acres in the United States alone have been torn up by strip mining. That is roughly equal in size to the U. S. state of Connecticut, or to Northern Ireland in the British Isles. And most of this land — about 66% — lies barren and unreclaimed, a monument to man's greed and destructiveness.

Of the 34% of "reclaimed" land, half has been rejuvenated *only* by forces of nature, not by the men who devastated it. Reclamation of stripped land is expensive, and seldom carried out by the companies who "mine" the coal. There are a few notable projects, however, where companies have leveled the land, planted trees, stocked artificial ponds with fish, and made other amends.

Yet, we can easily understand how difficult it is to "put it all back like it was."

Incompatible With Ecology

Furthermore, the resource being dug — coal, in this case — pollutes the air we breathe. Mr. Harry Perry, quoted earlier, told our staff: "No energy form is completely compatible with ecology. Nuclear energy generates thermal pollution. It also has a radioactivity problem. . . . Fossil fuels have the problem of oxides of nitrogen and sulfur oxides . . . and ash."

The burning of coal creates clouds of sulphur oxide and other pollutants which engulf cities and destroy health. Lower-quality coal is less desirable because it pollutes more. This becomes a serious problem, when we realize that *two thirds of the coal produced* east of the Mississippi River will not meet present pollution standards because it is too high in sulphur content.

Some areas like the city of Chicago have even rescinded anti-sulphur pollution laws so that low-grade coal could be used. It was either this alternative or simply *no power!*

And so modern man charges onward in the name of Technological Progress.

Oil Problems Too

Coal and coal-fired furnaces are not the only trouble. Along the U. S. Eastern Seaboard, where residual oil powers many utilities, shortages are occurring — and prices are on the rise.

New York City is a case in point. Here electricity prices are highest in the United States — $10.00 per 250 kilowatt-hours, compared with Los Angeles at $5.63 per 250 kilowatt-hours.

Foreign residual oil must be shipped long distances to reach U. S. ports, and prices increase with transportation costs.

The problem of getting oil is further complicated by the fact that 9 out of 10 wells sunk are dry! Each well drilled on land in the United States costs in excess of $50,000. Ten times that amount is spent for the average off-shore well, and over $1 million for the average Alaskan well!

And — it takes from 3 to 10 years for a field to go from initial discovery to full production.

To be sure, there is NO *present* worldwide oil shortage. There are, in fact, surpluses.

Nevertheless, America and the Western world continue to suck up and consume oil at an increasing rate.

By 1950, twice as much crude oil was produced as had been in 1945. By 1960 production doubled again, now 1000 millions tons. Eight years later, in 1968, it doubled again. Forecasts say it will AGAIN double, to 4000 million tons, by 1980.

With only growth in sight, we need to stop and ask ourselves some questions. How great are total fuel reserves? Can we really continue to use up these sources at an ever-increasing rate?

A Prognostication

In 1963, geochemist Harrison Brown, biochemist James Bonner and psychologist John Weir, published *The Next Hundred Years. In their study,* completed under the auspices of the California Institute of Technology, certain estimates were made concerning various sectors of the world economy. One of the items considered was the world supply of fuels.

They foresaw the future possibility of using energy equalling 100 BILLION tons of coal annually! Do we have sufficient coal, oil and natural gas to fulfill such voracious demands?

At the time, estimates put the total world supply of coal which could be practically mined at 2500 billion tons. This alone would provide the world's energy needs — at the then current rate of expenditure — for about 700 years.

Estimates of oil reserves were put at 1250 billion barrels. This could be equated to about 280 billion tons of coal. Adding actual coal and natural gas, the sum of these various sources of fuels amounts to the equivalent of about 3700 billion tons of coal.

Resource experts estimate that *at current rates* of expenditure the fuel supply should be sufficient to last for a thousand years.

But the rate of consumption is skyrocketing. Resources are dwindling alarmingly. Said authors Brown, Bonner and Weir: "At a twenty-five times greater rate of consumption, *they would last only another FORTY YEARS . . .* and we must recognize that, once our petroleum and coal have been consumed, as far as the human species is concerned, they will have disappeared forever" (*The Next Hundred Years,* pp. 99, 100).

It is of course very difficult to estimate "proved resources" especially of oil. Said resources expert Hans Landsberg: "Petroleum history is littered with the remains of obsolete guesses, spectacularly wrong. . . .

"One of the reasons is that only that relatively small part of oil occurrences that exploratory drilling has proved to

exist can be correctly said to be 'known.' Beyond, short of systematically digging up the first 60,000 feet of the earth's crust from pole to pole, one can go only by inference" (*Natural Resources for U. S. Growth,* Hans Lansberg, Baltimore, Johns Hopkins Press, 1964, page 177).

The point is — there may be more, but there may also be much less oil than is expected. Energy requirements are also little more than guesses based on past increases and hypothetical future considerations.

But, however long these fuels last, they may one day be used up. They are NON-renewable.

The Nuclear Power "Panacea"

Nuclear power plants have failed to become the great boon they were once expected to be.

Soon after World War II, the "peaceful atom" was predicted to be the power of the future. After all, coal, oil, and other fuels caused pollution. Nuclear energy was *clean,* authorities assured us.

Coal mining operations slowed their progress, bowing to the "peaceful atom." Many coal miners were thrown out of work. Large regions, especially in Appalachia, became depressed areas.

But many complications have arisen for nuclear energy.

For one — *it does pollute!*

Potentially, nuclear energy is much more dangerous and deadly than either oil or coal. A certain amount of radioactivity is inevitably released during the production of nuclear fuel for power plants, although this is generally conceded to be minor.

There is also a storage problem — how to handle the 3.5 million gallons of high-level waste estimated to be produced yearly by 1980.

Too Hot to Handle

Nuclear power plants have also come under attack in recent years because of a "new" type of pollution — *thermal pollution.*

The nuclear reaction produces heat to generate steam. This steam turns giant turbines which in turn generate electricity. As much as 50% of the heat created is "wasted." It must be taken away by the cool waters of a river, lake, or ocean — or by expensive evaporative cooling towers.

This waste heat is detrimental to life in the surrounding waters. It lowers the oxygen content and drives the water temperature up. Many desirable forms of life are destroyed, and undesirable forms proliferate, in the process. The delicate thread of life is broken, and ecology suffers. Rivers "die." Man suffers kickbacks, too.

Thermal and radioactive pollution are the "last straw" in the pollution controversy. They have caused a concerned and frightened segment of society to bring pressure against nuclear power plants. The whole U. S. nuclear plant program, as a consequence, has been delayed by 2 to 5 years.

Some look beyond fission (which supplies about 2% of present U. S. energy needs) and fusion (not even tapped yet) to a process called MHD — magneto hydrodynamics. But this is still dependent on a coal supply — and is presently only theoretical.

Environment Takes the Brunt

Consider this report from the Committee for Environmental Information delivered before the Joint Congressional Committee on Atomic Energy, January 2, 1970. It concludes:

"In the year 2000, if power consumption continues to increase at the present rate and there is no great increase in overall efficiency (which there is unlikely to be), power plants of all kinds will produce enough heat to raise *by twenty degrees* the total volume of water which runs over the surface of the United States in a year" (*Environment* magazine, Volume 12, Number 2, March 1970, page 4).

Less than *ten* degrees temperature change is enough to kill many fish, as fishermen and tropical fish hobbyists well know.

That perhaps is where the *current* energy crisis is — the destruction of our "good earth" as a direct result of our increased *demands* upon it. One specialist, Mr. Harry Perry, put it this way: "Do you want to improve the quality of the environment, or do you want the electricity to come on as you need it?"

This earth, after all, is a "closed system." It operates as a unit, and renews, replenishes, and purifies itself without any outside help other than energy from the sun.

There *are limits* to the earth's capabilities. Only certain quantities of additional carbon dioxide, carbon monoxide, sulphur dioxide, lead, etc., from the burning of fuels, can be absorbed into the system. Only a limited amount of extra heat can be absorbed by our streams before some life forms begin to suffer. Only so much radioactive waste can be absorbed. Then deformities and abnormalities in life forms occur.

We all know these basic facts!

The question is, does convenience of energy for the moment justify future ecological disaster — the possible destruction of life within a generation?

Most — if not all — of man's MAJOR exploits of his *only* environment are out of step with the natural regenerative processes on earth.

It's time man took a long look at fuels — and our spiralling increase in energy consumption — and asked some basic questions: Do we really *need* all this energy? Why did we build our economic structure on polluting, nonrenewable resources? There are, after all, other forms of energy available.

Thinking the Unthinkable

Even as polluting as the nonrenewable fuels are, they are not the central problem in themselves. It is man's *exploitation* of them for selfish profit and convenience which is at the heart of the problem.

For example, suppose man were to harness the sun's non-polluting energy. Would he use it wisely? Or would he turn it to profit-seeking and selfish, destructive uses? The history of man's greed is NOT reassuring.

It is becoming increasingly clear that man must totally re-evaluate concepts concerning the structure of society. The concentration of population, of industry, of power generation, is increasingly bringing us closer to a date with disaster.

We are encountering massive problems of distribution. We are faced with wholesale destruction of the landscape. We find it less and less practical

to utilize RENEWABLE sources of energy. The mammoth industrial demands of our highly technological society could not be supplied enough energy from simple wood burning or other similar *renewable* sources of energy. There just isn't enough wood, and other renewable sources — tide power, geothermal steam, solar energy — are not developed.

The solution is to restructure society to a much simpler form, *reducing* total energy consumption. We are polluting ourselves to death by being forced to rely on "dirty" fuels.

Dr. James P. Lodge, Jr. of the National Center for Atmosphere Research in Boulder, Colorado had this to say:

"We must limit our own population it is true, but it is even more necessary to impose a program of rigorous birth control on our energy slaves. To say that this program is an enormous program of RETHINKING PRIORITIES is to state the obvious, but it is nonetheless true."

The Greatest Change of ALL

We need to consider a change of *approach* in dealing with our environment. We have been careless — blasé — in our use of this earth. We have polluted, raped and destroyed the earth God gave us.

You need to write for a FREE copy of *Our Polluted Planet*. It explains how we are destroying the intricate balances of our earth systems — and the dire consequences we are producing.

Are we yet willing to cease the greedy and ignorant destruction we have caused? At the present time mankind *as a whole* is not yet ready to make this necessary change. Because the biggest change needed is a change in man's basic nature and outlook in life. Man's nature is one of getting for the self instead of giving. Man has *taken from* the earth — instead of *taking care* of it.

Will man go too far — so far he can't cleanse this earth of its pollution? Will man respond in time to the moaning and groaning of the earth? Some authorities warn that man may already have gone too far — that it may already be too late to save this earth from man's devastating exploitation.

Almost 2000 years ago, a great teacher wrote: "For we know that the whole creation groans and travails in pain together until now" (Romans 8:22). That scripture has come to pass in our day. Our earth is wounded and we are wielding the death weapon. It may kill *us!* Unless, we change. □

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