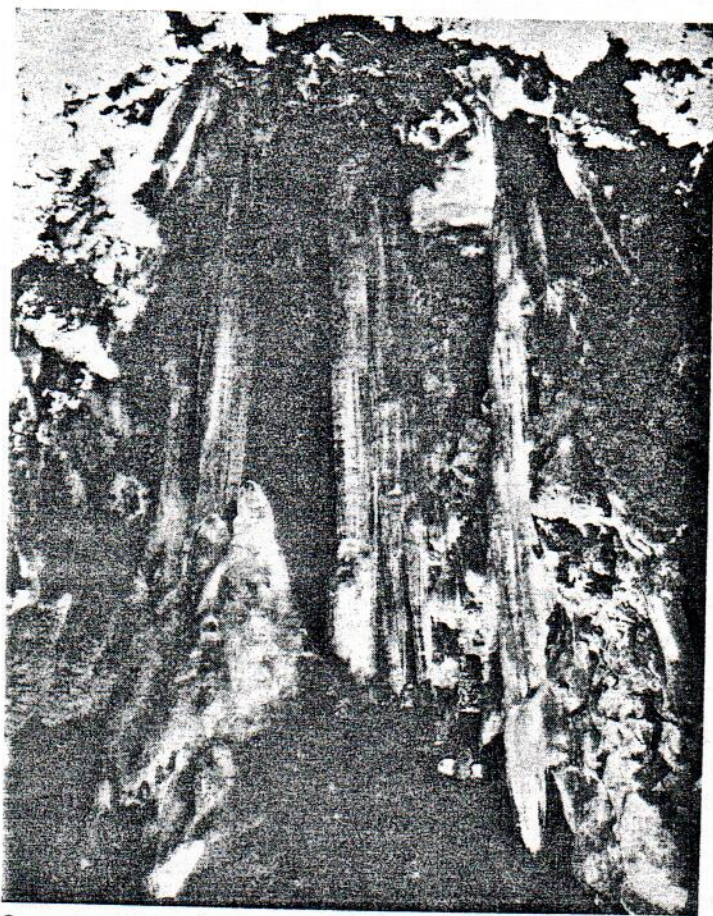




Centuries-old ice formations are located 160 ft. under the sun-baked desert of southeastern Idaho. Temperatures on the ground range in the high 90's while the ice cave remains a consistent, cool 32° year-round.

THERE'S EVEN A MARKET UNDER THE EARTH

By PEGGY PAPADAKIS
American Falls, Idaho

PROPANE MAKES IT ALL POSSIBLE

Crystal Ice Cave, located on a wide welcome relief from the 95° in-blistering volcanic desert in the-shade temperatures. During the southeastern Idaho, 22 miles from winter, propane heaters and furnaces supply cozy, practical heat. Highway 39 between Aberdeen and American Falls, uses propane to And last, but far from least, the propane-powered generators pump vital water from a depth of 800 feet below the surface. On the desert 160 ft. underground into an extinct volcano—the Great Rift National Landmark—and provide electricity there's nothing more important than water and you must be able to depend upon your equipment set-up. to illuminate the centuries-old ice formations in the cave which is Within propane we've never needed to worry. Who could ask for anything more?

Propane generators supply power for guided tours which take visitors 160 ft. underground into an extinct volcano—the Great Rift National Landmark—and provide electricity to illuminate the centuries-old ice formations in the cave which is within the Great Rift, a rare fissure-type volcano 46 miles long.

On the surface propane-originated power cools pop and runs air conditioners in the buildings to provide a

Our story begins some eight years ago while Jim was happily pursuing his hobby, spelunking. During a visit to this area, he heard about a wild ice cave from a couple of local 'cave-men' who gladly offered to take him there.

The three adventurers headed out, driving across the rugged moon-like terrain as far as they could go, then loaded their caving equipment on their backs and walked the remaining distance across the lavas to the fantastic rift. A nasty looking abyss, the natural entrance to the cave, was their destination. Using their precious knowledge and caving skills, they descended into the deep crevass, losing shoe leather, bits of clothing and flesh to the rough, basaltic lava as they went. Eventually they crawled through a frosty tunnel

which ended with a glistening ice flow and cascaded into the cave.

Giant Stalagmites. The three men slid down the ice into the cavern which had remained hidden to man until 1956. In September of that year, two area spelunkers decided to probe the depths of the Great Rift; their adventure led to their discovery of the cave. Townspeople found it difficult to believe the stories of giant ice formations under the hot desert, and as a result, only an adventuresome few dared to make the rigorous 160 ft. descent by rope.

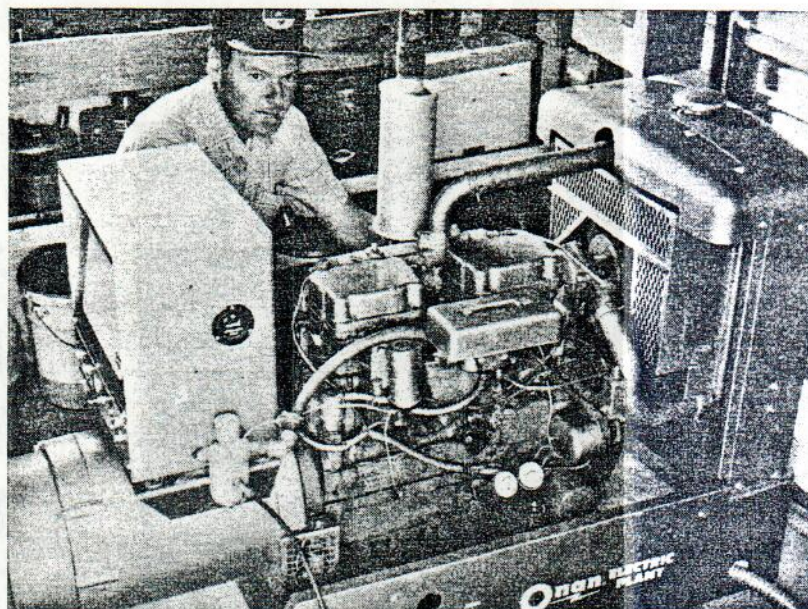
Jim was now one of those few. He began to probe the darkness with his flashlight, then sucked in his breath as he saw, shimmering against the inky background, a giant stalgmite of pure ice about 25 ft. high. Icicles hung from the sides of the rift and delicate, hexagonal ice crystals were growing from the ceiling.

Jim was overwhelmed. His trained geologist's eyes were trying to assimilate the phenomenon he was looking at. He had never seen anything like it in all his days of caving.

Moving along, the trio explored the icy underworld as best they could with flashlights and carbide lamps, sliding down another flow, dwarfed by other formations and gazing up at the 40-ft. high ceiling of the cave. Ice creepers on their feet kept them from falling and helped them climb the ice slides when they exited from the cave.

Hidden Beauty. During the ride back to town, Jim was pensive. The memories of the translucent beauty of the delicate ice formations and grandiose pillars filled his mind. He kept thinking people that weren't cavers should be able to view these magnificent formations which nature had kept hidden for centuries under the sage covered desert. Elderly travelers, school children, young people with no caving skills—people who would never see this wonder of nature if it remained a wild cave.

For weeks the idea nagged at him. For weeks he kept rejecting it,



This propane-fueled, 15-KW RJC engine-generating set provides the power for surface and underground lights, pumps water from 800 ft. beneath the surface, and furnishes electricity for general appliance use. Cave developer Jim Papadakis has used the propane set-up for seven years.

for the task seemed too gigantic. Finally, however, he weakened. His first step was to contact the U.S. Department of the interior to see if he could make the necessary arrangements, since the cave was on federal land. In 1963, two years after he had first seen the cave, and after months of letter writing and paper work, he was ready to begin.

Reliable Power Source. When you choose to live in the middle of 20,000 virtually uninhabited square miles, you have to make the right decisions for your welfare and security right at the beginning. The vast Snake River Plain, which was to be our home had been built up from lava flow upon lava flow, and didn't offer exactly what you'd call country living. There were no power lines, no communications, no water and no neighbors. The last signs of life stopped ten miles south from us. All we'd have to depend upon would be ourselves and our equipment set-up. The closest towns, Aberdeen and American Falls, are both about 30 miles away.

"Whatever we choose as a source of power, it has to be reliable," Jim said, "because our very existence depends upon it."

After careful investigation, our plans were carried out. Three-fourths in. black pipe was buried underground and copper tubing led to all engines and appliances from a 1000-gal. propane tank. Two generators equipped with propane carburetion had been ordered from the factories. (One is a 15KW 3-phase, 120/208V-60 cycle, water cooled 4-cylinder Onan; the other is a 6.5KW 1-phase, 120V-60 cycle, water cooled 4-cylinder Kohler)

Propane Does the Job. Propane is the single source of power for our entire operation. All electricity is generated by the two light plants. A 5-hp electric submersible pump is at the bottom of the 800-ft. well, pumping pure drinking water into a 4000-gal. cistern on the surface. All heaters and the forced-air furnace in our large mobile home are propane powered, as are the hot water heaters and three propane refrigerators. (One is in the utility building where the generators, pressure system, restrooms and washing facilities are; one is in our living quarters and the other in the guides' quarters.) It's a neat set-up and we don't have to worry because it's dependable as well as economical.

The cave is open to the public for six months, from May 1 to Nov. 1 (7 a.m. to sunset), and we're here ten months out of the year. Our annual propane consumption is about 2500 gal.

Blasting Begins. In the Fall of 1964, after the power plants were in place and the well had been drilled, Jim was ready to blast. Before he could do any actual blasting, he had to crawl into the yawning depths of the rift with his light, rope ladders, and other equipment to determine the path of the tunnel which would follow alongside the open rift. Finally the plan was finished and the labor began.

A pattern of 18 holes was drilled in the rock and fitted with 40 sticks of dynamite. Each blast loosened four ft. of lava which was hauled away a ton at a time by a diesel ore carrier. Relentlessly, he and his daring men inched their way underground, operating 24 hours a day. As they progressed, they would string incandescent lights in the tunnel. When you leave sunshine and enter the darkness of the underground earth, light is beautiful—and so is the sound of that smooth running propane generator aboveground. Neither of us had to worry.

For ten months the blasting continued, until 1000 feet of tunnel was completed. The deeper the men got, the slower the work went. Near the cave, blasting became tedious and unbelievably time consuming. Extreme caution had to be taken not to destroy the very ice formations they were trying to preserve for public view. At last the exacting work was completed, and the cave was ready to open for public viewing.

World of Great Rift. That was three years ago. Today there is 1200 feet of completed tunnel which has been blasted through the solid lava and which takes you 160 ft. underground into the phenomenal world of the Great Rift. The cave is softly illuminated with indirect lighting from low temperature ballast fluorescent lights, and the tunnel is lit by cheery strings of 60W bulbs, about 120 in all.

This year marks the fourth full season the cave has been open to the public. Persons from all over the world have come to see the spectacular beauty of the cave and the awesomeness of the Great Rift which is believed to be the deepest open volcanic rift on earth. At a certain point underground, guides turn off the lights and demonstrate to their visitors what total darkness is really like. Until you've experienced this sensation, you have no true appreciation for such a simple act as flipping a light switch. We can breathe easily, however, because in four years of guiding some 100,000 persons underground we have never lost our power. We even watched the Apollo 11 moon landing with our propane-powered electricity.

Moon-Like Surface. Scientists and astronauts that have visited us tell us our area is much like the moon's surface in appearance—that's minus the sagebrush, of course.

When we're very busy and people are running drinking water, pulling cold pop from vending machines, flushing toilets, and vying for seats close to the air conditioner, most of them never give these luxuries a second thought. With us, it's a different story for we know that a 1/3-hp pump is pushing water into pressure tanks as fast as the people are running it out and that we aren't going to have a power failure while there are hundreds of tourists underground enjoying the cool tranquility of the cave.

We're pretty smug about our set-up because it's clean, dependable and virtually trouble-free. We have enough to do without asking for more work.

Our engines run trouble free and last longer; there are no carbon deposits and the engines start easily even in the coldest weather. To top it off, our maintenance dollar savings are great.

Next year will see new expansion in buildings and facilities here at the Crystal Ice cave, but the only change in our equipment set-up will be a larger propane tank. ■

ELECTRIC HEAT IS ARE SHORT OF EL

Electrical shortages and threatened shortages notwithstanding, electric heating is still growing in certain areas of the U.S.—and, in most of them it is still no bargain.

Example: In Grand Rapids, Michigan, the average home can be heated with natural gas for \$136.58, but to do the same job with electricity costs \$568.76. Prevailing rates are 81.4 cents per Mcf for gas and 1.56 cents per kwh for electricity.

Or you might heat with oil at 16.9 cents per gal for \$231.02.

These figures, and many others relating to heating costs of various fuels, are contained in INGAA's booklet, *Comparison Of Seasonal Househeating Costs For Gas, Fuel Oil, & Electricity—1970 Season—65 Cities*, August 1971. LP-gas is not included in the comparisons, but with a minimum of computation it is possible to relate the costs of the other fuels to LPG. In the case of Grand Rapids, for example, electricity at 1.56 cents and 100% efficiency is equivalent to LP-gas at 33.47 cents a gallon and 80% efficiency. Thus propane at, say, 22.16 cents would save the homeowner a third off the cost of electricity—or about \$190 a year.

Wide Variations in Rates. Figures are given for 65 cities in the U. S. degree days vary from 766 in Orlando, Fla., to 9,359 in Minot, N.D. Electricity rates vary from 0.81 per kwh in Seattle and Tacoma, Washington, to 2.2 cents per kwh in Cambridge, Mass., nat-

