Summary of Personal Accounts

Description:	<u>Family camping at Rainbow Point, Hebgen Lake, MT</u>
Author:	Orton, Jean E.
Info Categories:	E, G, N, P
Description:	<u>Two individuals, dog, and parrot in Idaho Falls, ID</u>
Author:	Loosli, Stuart
Info Categories:	E, N, P
Description:	<u>At home in Idaho Falls, ID</u>
Author:	James, Georgia
Info Categories:	E, N, P
Description: Author: Info Categories:	Park rangers and truck drivers at West Yellowstone entrance to Yellowstone National Park Park Rangers, Truck Driver E, G, L, P
Description:	Manager of Duck Creek cabins near West Yellowstone, MT
Author:	Yetter, Jerry
Info Categories:	P
Description: Author: Info Categories:	Man who drove off fault scarp near Duck Creek Junction, north of West Yellowstone, MT Whitman, Rolland G, L, P
Description:	Manager of Hilgard Fishing Lodge, Hebgen Lake, MT
Author:	Miller, Grace
Info Categories:	B, G, P
Description: Author: Info Categories:	Caretaker family at Culligan's "Blarneystone Ranch," north of Hebgen Lake, MT Russell, John & Doris B, G, P
Description: Author: Info Categories:	U.S. Geological Survey geologist camped north of Hebgen Lake, MT Witkind, Irving J. P
Description: Author: Info Categories:	Experiences of residents and campers near Hegben Lake and the Madison River Canyon Witkind, Irving J. E, G, L, N, P

Description:	Camper at Beaver Creek campground on Madison River
Author:	Burley, Robert M.
Info Categories:	A, E, G, L, P
Description:	<u>1st doctor to reach earthquake area north of West Yellowstone, MT</u>
Author:	Bayles, R.G.
Info Categories:	A, B, G, L, P
Description:	Family camped in trailer near Madison Canyon landslide
Author:	Bennett, R.F. family
Info Categories:	G, P
Description: Author: Info Categories:	<u>Family camped at Beaver Creek campground, Madison River</u> <u>Canyon</u> Smith, Lewis family G, P
Description:	Family camped at Rock Creek campground, Madison River Canyon
Author:	Ost, Rev. E.H.
Info Categories:	G, P
Description: Author: Info Categories:	<u>Couple who clung to tree in rising Earthquake Lake, Madison River</u> <u>Canyon</u> Mault, Grover A, G, P

Information Categories

A -- Aid:

provide medical services, shelter, donations, loans, advice, encouragement, implement safety measures

B -- Building Damage:

structure itself plus windows and chimneys (typically damage visible from outside the building)

E -- Earthquake Description:

where, when, duration, direction, sound, motion, number and timing of aftershocks

G -- Geologic Effects:

changes at the Earth's surface, fault scarps, rockfalls, landslides, ground cracks, ground subsidence, sand boils, water spouts; effects on springs, lakes, wells

H -- Humor:

I -- Impact:

changes in daily routine; rumors; influx of reporters, politicians, cost in dollars

L -- Lifelines:

effects on transportation: roads, bridges, railroads, airports effects on communications: telephone, telegraph effects on power, gas, water, and sewer lines effects on dams

N -- Nonstructural Effects:

effects on plaster, furnishings (typically damage or rearrangement of furnishings visible inside a building)

P -- People:

effects on and responses to, during and after; deaths, injuries, near misses

R -- Recovery:

clean up, rebuild

S -- Scientific:

explanation of the day

Excerpts from: Letter written in response to newspaper article requesting personal accounts of earthquake experiences in the Intermountain West and follow-up interview Submitted by: Jean Ensign Orton Magna, Utah December 1995 Location at time of earthquake: Campground at Rainbow Point on Hebgen Lake, MT

Rainbow Point, six miles from Hebgen Dam on Hebgen Lake, is our favorite camping spot because of the great fishing. That's where we experienced the August 1959 earthquake.

That evening we ate dinner late, and didn't clean up before going to bed. I even left the eggs for breakfast out on our camper counter. The earthquake woke us up. The sound was very loud. So was my husband's swearing. We got up quickly, but slipped in spilled chili and raw eggs. The girls climbed down from their bed and began cleaning up the mess, but the shaking just kept up. When we finally got outside, we could see large pine trees all around us sway to the ground. It was hard to believe what you were seeing! My parents were camping with us in a small teardrop trailer. My husband and my mother stood for twenty minutes apologizing to each other for being in their underwear!

I was frightened, but I had my family there, my mother and dad and my children, so a lot of the fear left. The one thing that scared me the most was the fact that the shocks never stopped. Those aftershocks were the worst things.

There were about 50 or 60 people camped there with us. One man tried to leave, but had to return when he found large crevices in the road. We were all trapped together for three days. Everyone was cordial and helpful. My twelve-year-old daughter helped get the older people up and out. Many were nearly hysterical. One man refused to come out until he could find his teeth. Luckily my husband had pulled our boat out of the water earlier in the evening. All of the other boats were lost in the tidal wave. The boat had a radio, and that radio was the only one in camp. No news about what had happened was announced on the radio until around 6:00 or 6:30 in the morning. We heard on a California station that there had been a "small earthquake." By that time it was light, and we could see a house dropped into the lake and a huge crevice in the road that goes over to the dam and the camping area below it. There was a car in the crevice! The aftershocks never stopped. And then someone noticed that the mountain was gone. We had been able to see it from there before, and now it was just gone!

When we learned that we couldn't get out, we all met and decided what to do. First, we put the toilet right side up. Then we did an inventory on food. There was great camaraderie. That afternoon we heard on the radio that they were worried about the campers at Rainbow Point. They asked us to please call and let them know how we were. Of course, we had no phones, so got a good laugh out of that. A helicopter came by the second day, and someone on a bullhorn asked if we were OK. No one was hurt.

Finally a bulldozer filled in the road, and we were able to leave. When we got to West Yellowstone, we stopped to call home. My husband's brother had just taken the obituaries to the newspaper with my mother and dad's pictures--the Sadler obituaries! My husband was a prominent businessman in Tooele, Utah, at that time, and the whole town was in mourning for us all.

The next year we went back to Hebgen Lake, but didn't stay. It was eerie. The mountain was down and the sun was shining through the dead trees. This whole earthquake experience was very humbling. We felt so insignificant compared to the world. We never felt closer to God.

Excerpt from: Letter written in response to newspaper article requesting personal accounts of earthquake experiences in the Intermountain West and follow-up interview Submitted by: Stuart Loosli Salt Lake City, Utah December 1995 Location at time of earthquake: Idaho Falls, Idaho

On the evening of August 17, 1959, I had returned home from a movie with my future wife, Jessie. While decompressing in our family/TV room in the basement of my parent's home at 441 Ninth Street, Idaho Falls, Idaho, I was watching a "TBA" program on the television. Most TV shows were "TBA" - To Be Announced- in those days. Suddenly I felt a deep earthbound thump and then the hanging ceiling lamps with the green lamp shades and very dim lamps began to sway. Reclining on the couch did not seem advisable. I ran up the stairs and into the backyard to see what else might be happening. The Atomic Energy Test Site always lurked on the horizon to the west. Outside, a few dogs were barking. The wire cable suspended street lights and the overhead phone and power cables in the alley behind the house were bouncing and swaying back and forth. Suddenly I realized that perhaps an earthquake had occurred or was occurring. I remember being enveloped by an eerie uncomfortable sensation, but no real sense of imminent doom or danger. The questions of What? Where? When? How? And Who? wouldn't be answered until later or even never. I have always felt a bond with that event, the people affected and that part of our Intermountain history.

Across town Jessie was dressed for bed in her basement bedroom. Suddenly a thump, and then the upstairs commotion was too loud to ignore. The family pet parrot, Loretta, had been knocked from her perch and out of her sleep onto the floor where she was face to face with the family dog, Lance, a champion pet miniature poodle. Both dog, Lance, and parrot, Loretta, had been given to the Manwarings by Aunt Mel from Connecticut. Lance's pedigree was impeccable, but Loretta's history was suspect and apparently included a tour of duty with a very profane and salty sailor. As Jessie came up the stairs, the conversation was going something like: "Damn Lance" "Bad Dog" "Bad Dog"! Along with the strewn sunflower seed husks, bird gravel, perches and water, nobody forgot that night!

Interview paraphrase: Georgia James of Salt Lake City, Utah, by a junior high school student fulfilling a classroom assignment

Submitted by: Sheena James student of Ms. Bonnie Nelson Olympus Junior High School; Granite School District Salt Lake City, Utah November 1996 Location at time of earthquake: Home in Idaho Falls, Idaho

I was asleep in my bedroom on the main floor of our house in Idaho Falls. I heard a loud bang, felt a shaking, and all the lights in the house came on. I went into the kitchen. My father was trying to figure out who turned on all the lights. We thought that some of my brother's friends had been messing around. We didn't know until the next day that it was an earthquake.

Excerpt from: <u>The Night the Mountain Fell: The Story of the Montana-Yellowstone</u> <u>EARTHQUAKE</u> by Edmund Christopherson; p. 6 printed with permission from current holder of copyright

Experience of: Yellowstone National Park rangers and truck drivers Location at time of earthquake: West Yellowstone entrance to Yellowstone National Park

When the quake hit, summer Alternate Rangers Fred Tim and Lamont Herbold were on duty at the West Yellowstone entrance of Yellowstone National park. They had just cleared a semi-load of Pres-to-Logs. As the truck pulled on through the gate, the plywood gatehouse shook so violently, with the lights flashing off and on, that Herbold shouted,

"Stop the truck, you....., you've hooked the shack!"

Truck drivers Jack and Lyle Tuttle thought the frantic way their truck was flopping around meant the motor had broken loose from the mounts. Driving into the Park, they were halted by huge rocks blocking the road. Renewed shaking, with tons more rocks rolling down the mountainside sent them scurrying for cover behind trees. Lyle took refuge in a tree, where, he later said, the shaking seemed twice as rough.

When the quaking stopped briefly, they turned the truck around ad were happy to get out before more boulders blocked their exit.

Excerpt from: The Night the Mountain Fell: The Story of the Montana-Yellowstone <u>EARTHQUAKE</u> by Edmund Christopherson, p. 7 printed with permission from current holder of copyright Experience of: Jerry Yetter, manager of motel near West Yellowstone Location at time of earthquake: Duck Creek Cabins near West Yellowstone

In the confusion that followed when the first shock hit, Jerry Yetter, who operates the Duck Creek Cabins near West Yellowstone, jumped out of bed and knocked on all the cabin doors to warn the occupants of the quake. Only after he'd finished the job did he realize that he was wearing no clothes at all.

His wife, Iris, ran onto the front porch. The porch dropped into the basement. She climbed out, got into the car, and didn't stop until she reached Bozeman, 90 miles to the north.

Excerpt from: The Night the Mountain Fell: The Story of the Montana-Yellowstone EARTHQUAKE by Edmund Christopherson; p. 7 printed with permission from current holder of copyright Experience of: Rolland Whitman

Location at time of earthquake: Near Duck Creek Junction north of West Yellowstone,

ΜT

Just west of the Duck Creek Junction of highways 1 and 191, the first shocks wakened Rolland Whitman as it sent dishes and furniture crashing to the floor. When he couldn't reach his wife's folks in West Yellowstone, 10 miles south, by phone, he rushed his wife, Margaret, and their six children into the car, started out, and immediately crashed over a 13-foot drop-off scarp that the quake had jutted up between his home and the highway.

Excerpt from: <u>The Night the Mountain Fell: The Story of the Montana-Yellowstone</u> <u>EARTHQUAKE</u> by Edmund Chistopherson; p. 9 printed with permission from current holder of copyright Experience of: Mrs. Grace Miller, manager, Hilgard Fishing Lodge Location at time of earthquake: Hilgard Fishing Lodge; Hebgen Lake, Montana

On the night of the quake Mrs. Grace Miller, a widow who, in her seventies, is still sprightly enough to run, single-handed, the Hillgard Fishing Lodge cabin and boat rentals on the north shore of Hebgen Lake, found herself suddenly wakened about midnight. She didn't know what was happening, but she felt she had to get out of the house. She threw a blanket around herself. The door was jammed, and she had to kick to get it open.

Outside the door she saw a big, 5-foot crevice. As she leaped across it, the house dropped from under her into the lake. More crevices kept opening in the moonlit ground as she walked away from the lake. "Rabbits were skedaddling in every which direction," she said, but her Malemute dog, Sandy, was so frightened he wouldn't even notice them.

After quite a spell of hiking in the nightmare-like night, she found refuge along with about forty other people at Kirkwood Ranch, which itself was considerably damaged, but a safe distance from the lake. She was safe there, while next day skin-divers, alerted by worried friends, searched her floating house for her body.

Later next day she boated past her 9-room home--which contained everything she owned, floating on the lake.

"I hope it stays upright," she said. "My teeth are still on the kitchen counter, right next to the sink."

When she arrived at the dam, she greeted an acquaintance with, "I've been a pretty tough old bird, but I wouldn't want to go through that again!"

Excerpt from: The Night the Mountain Fell: The Story of the Montana-Yellowstone EARTHQUAKE by Edmund Chistopherson; p. 10 printed with permission from current holder of copyright Experience of: caretaker family at Blarneystone Ranch Location at time of earthquake: Blarneystone Ranch near epicenter

At the Emmett J. Culligan place, dubbed the "Blarneystone Ranch," the Santa Barbara water softener tycoon spent hundreds of thousands of dollars building a refuge from the possibility of atomic attack.

Ironically, the main fault of the earthquake rammed through one end of his building's cement block foundation, raising the ground 15 ft., twisting and cracking the whole 150-ft. length of the building.

His caretaking family, John and Doris Russell, were trapped in their cottage and had to crawl out and pass their children through a chin-high 15-inch square window.

Excerpt from: The Night the Mountain Fell: The Story of the Montana-Yellowstone <u>EARTHQUAKE</u> by Edmund Chistopherson; p. 12 printed with permission from current holder of copyright Experience of: Irving J. Witkind, U.S. Geological Survey geologist Location at time of earthquake: Geological Survey camp trailer located north of Hebgen Lake, near Blarneystone Ranch

The only man who was enthusiastic about the earthquake from the start was geologist Irving J. Witkind of the U.S. Geological Survey, who was living in a trailer on a rise to the north of Hebgen Lake, above the Culligans and Parade Rest, while he surveyed and mapped the area.

When the first shock hit, he figured his trailer had somehow broken loose and was rolling down the hill. He charged out, intent on stopping it. From the way the trees were swaying in the absence of any wind, he knew it was a genuine earthquake. He hopped in his jeep and headed down toward the lake. He saw the scarp that the Whitmans soared off just in time to stop.

"It's mine! It's mine!" he shouted as he got out of the jeep and realized the full measure of his fortune. His words will echo wherever geologists gather in years to come. Professionally, his once-in-a-thousand-lifetimes fortune in being on the scene of a major quake meant as much as discovering an unfound Pharaoh's tomb would to an Egyptologist.

Published Article: Events On The Night of August 17, 1959--The Human Story by Irving

J. Witkind, geologist; published by U.S. Geological Survey as <u>Professional Paper 435-A (1964)</u>

Experience of: Irving J. Witkind, U.S. Geological Survey geologist Location at time of earthquake: Geological Survey camp trailer on hillside near Blarneystone Ranch

EVENTS ON THE NIGHT OF AUGUST 17, 1959 - THE HUMAN STORY The Hebgen Lake, Montana, Earthquake of August 17, 1959 By Irving J. Witkind

Abstract

The Hebgen Lake area and the nearby canyon of the Madison River are popular tourist localities, and on the night of August 17, 1959, almost every campsite was occupied. At 11:37 p.m. an earthquake jarred most of the campers awake. A few panicked, and in trying to escape from one danger, faced another. Most of the campers, however, showed unusual courage and calmness. With few exceptions, the people near the lake spent the rest of the night either around campfires or in their cars. Those in the confines of the canyon downstream from Hebgen Dam moved to high ground to await rescue. Despite serious damage, the dam remained standing and averted greater disaster. Nevertheless, 28 persons were dead or missing when the earthquake was over.

Account of Events

The Hebgen Lake area, an attractive tourist site near Yellowstone National Park, is crowded with visitors during the spring and summer months. Many summer homes have been built in wooded patches along the south shore of the lake; and motels, dude ranches, campgrounds, and trailer parks line Montana State Route 499 (former State Highway 287) along the north shore. Below Hebgen Dam, where the highway follows the Madison River through a narrow canyon with steep towering walls, the U. S. Forest Service has built and maintained a series of campgrounds, among them the Rock Creek Campground.

During the early and middle parts of August 1959 the weather was nearly perfect--cool sunny days and clear calm nights. On the night of August 17 the moon was full. Tourists crowded the area, so much so that late travelers through the Madison River canyon could find no available site at any of the campgrounds and reluctantly continued on.

The first earthquake shock came at 11:37 p.m., after most of the residents and tourists were abed. It is uncertain just how long the earth trembled--estimates range from about 5 seconds to as much as several minutes--but those who experienced the violent shaking will certainly never forget it. Some nearly panicked; others showed great courage.

Our Geological Survey camp consisted of two house trailers parked on a small hill near the Blarneystone Ranch. Mr. and Mrs. J. B. Epstein occupied one trailer; I occupied the other. A day after the earthquake, Mrs. Epstein wrote this to her friends:

All of a sudden the trailer began to shake violently up and down and back and forth. I thought at first that Jack was fooling around and shaking the trailer, but in a split second I looked around and saw:

- I. Water pouring out of the wash basin.
- 2. All dishes, groceries, and clothes falling out of the cabinets.

3. The gasoline lantern hanging from the ceiling, swinging in a 2-foot circle, and looking as if it would fall any minute. If it did it would have set the whole trailer on fire.

There were fantastic rumblings. The farthest thing from my mind was an earthquake. In this same split second I thought that the 100-pound propane tank outside the trailer was starting to explode and that's what caused the noise and shaking. In pure horror and fright I dashed out the door and screamed for everyone to follow and run as far away from the trailer as possible. Jack was still in the trailer, trying to stop the lantern. He got beaned on the head with it, gave up, and came charging out. He had realized from the first that it was a quake. My complete horror came after I hit the ground and found that it was no better than in the trailer. The solid earth, "terra firma," was like a glob of jelly. I was frantic--there was nowhere to get away from the fantastic sensation. Jack screamed not to run near the woods because trees were toppling all over. We could hear loud rumblings due to rock slides and landslides in the mountains.

At the time of the earthquake I was asleep in my trailer. As I later wrote to my wife, "I went to sleep about 9:30 p.m. and was awakened by the frenzied jiggling of the trailer. Things were falling from shelves all over the place. I thought that the trailer had somehow come off its jacks, jumped the chocks, and was rolling down the hill. I scrambled out the front door determined to stop the trailer, no matter what, although I had no idea as to how I would go about it. When I got outside, the trailer was in place, but the trees were whipping back and forth and the leaves were rustling as if moved by a strong wind--but there was no wind. I knew right then that it was an earthquake. I could hear avalanches in the canyons behind me, and could see huge clouds of dust billow out of the canyon mouths. Jack Epstein, who was awake at the time of the earthquake, says he heard a deep rumbling in the earth.

I noted the time of the first shock, and kept track of the major aftershocks for about 20 minutes before I decided to visit the Blarneystone Ranch and see if they needed help. I drove down the hill toward the ranch. About a quarter of a mile from camp I came upon a large new fault scarp that cut across and displaced my access road.

The Blarneystone Ranch was severely damaged (fig. 6). When John Russell discovered that the doors of his apartment there were jammed shut and that he and his family were trapped, he broke a window and used it as an exit. Others in the main dwelling made

their way to safety through once-orderly rooms that were now a scene of displaced and overturned furniture, fallen pictures, and plaster.

The Parade Rest Ranch, about half a mile to the south, was also damaged, although not as severely. Mr. Wells Morris, Jr., the owner, was suddenly awakened by the distinct sensation that his bed was falling from beneath him in short spasmodic jerks.

Also awakened by the quake, a family in a motel on U. S. Highway 191 hastened into their car and raced southward, trying to escape, only to drop off a new fault scarp which crossed the highway about 500 feet from the motel. The car turned over and was demolished; the family returned to the motel, unharmed.

A rancher hurrying to help his neighbor drove off a new scarp about 100 feet from his house. His car remained on end all night.

Shortly after the earthquake, the occupants of a small house trailer parked near the north shore of Hebgen Lake discovered to their horror that the lake which had been 50 feet away was now swirling around the trailer, and rising. The couple made their way out, waded through the water to higher ground, and then watched the trailer float away. The next morning only the open hatch in the rooftop could be seen, some 100 feet offshore.

At Hilgard Lodge, about a mile southeast of Hebgen Dam, the earthquake and the accompanying surges of the lake wreaked havoc (fig. 9). The main dwelling and a group of connected motel units were built on a broad sloping alluvial cone at the northeast edge of the lake--a sector of ground that dropped about 10 feet during the earthquake and was broken by many small scarps and gaping fissures. All the buildings were tilted and knocked askew, then lifted and dropped by a wave of water that moved toward the dam. Mrs. Miller, the owner, was asleep at the time of the quake. Suddenly aware that her house was sliding into the lake, she scrambled out with great difficulty and, dazed and shocked, stumbled across scarps and fissures in a rough sagebrush pasture to the Kirkwood Ranch, more than a mile away.

George Hungerford, foreman at Hebgen Dam, and Lester Caraway, his assistant, were awakened by the major shock and within moments recognized it as an earthquake. With their wives, they hurried to a water gage downstream from the dam to see if the river flow showed that the dam was leaking. As they neared the gage, Hungerford heard a roar. He glanced up to see a wave of water about 4 feet high moving down the river. Fearing that this meant the collapse of the dam, he returned to his house on the highway above the gage and tried to telephone a warning, but the line was dead. The two couples then drove toward the high ground near the dam and arrived there at about 11:55 p.m.

The moon was obscured by dust, and it was very dark. The water had withdrawn from sight, but they noticed that the downstream side of the dam was wet. Then, before they could see it, they heard water again; it was coming down the lake. They climbed out of

the way and watched the water rise, overtopping the dam by about 3 feet. After 5 or 10 minutes it receded, then disappeared from sight. "All we could see down the dam was darkness again," Hungerford recalls.

The crest of the dam was again submerged in 10 or 15 minutes, but this time by less water, and the water receded sooner. In all there were four surges over the crest. Between them, Hungerford and Caraway could see no water on the upstream side, even once when they ran out onto the dam. The water in Hebgen Lake had been sloshed about like water in a bathtub, and it continued to oscillate, though less violently, for at least 12 hours after the quake (Myers and Hamilton, chapter I).

Many of the campers downstream from the dam were slow to realize what had happened. They woke and looked about them, confused, but the aftershocks alerted most of them to the danger. Fearing that the dam would break, they abandoned their trailers and fled by car to higher ground.

Among them was the Lewis Smith family of Greeley, Colo., who were sleeping in a small house trailer in the Beaver Creek Campground, about 2 miles downstream from Hebgen Dam. Awakened by the violent shaking of the trailer, Mr. Smith called to a neighbor and asked what had happened. An earthquake, he was told--and the dam was not far upstream. Smith decided to evacuate his family and leave the trailer behind.

When he reached State Highway 499 he had two choices. He could turn northeast and drive toward the dam for about 2 miles to the high ground on which the dam was built, or he could turn southwest and drive down the Madison River canyon for about 5 miles and then leave the confines of the canyon for the open country west of the Madison Range. Believing that the dam would break at any moment and unwilling to risk driving toward it, Smith turned southwestward, down the canyon. Three and a half miles from the campground a huge boulder blocked the road, but Smith was still unwilling to drive the other way. The family left their car and climbed to higher ground, where they spent a cheerless night. Boulders were crashing down the mountainside, but not until daybreak did they realize that the route was blocked by a great landslide.

Early the next morning, Smith returned to his car and listened to a radio broadcast in which the collapse of Hebgen Dam was declared imminent. He drove his car part way up a small hill, then rejoined his family. The Smiths were rescued by helicopter that afternoon; their car was gradually inundated as the river, penned up behind the Madison Slide, rose to form Earthquake Lake (frontispiece).

For some travelers the night of August 17 was more tragic. Mr. and Mrs. F. R. Bennett and their four children, en route from their home in Coeur d'Alene, Idaho, to Yellowstone National Park, camped that night in the Madison River canyon near Rock Creek Campground, which was later partly buried by the Madison Slide. The parents were sleeping in their small house trailer, and the children were in bedrolls on the ground nearby when Mrs. Bennett was awakened by a loud noise. "Some time later" she heard a great roar and, alarmed, went with Mr. Bennett to check on the children. Just as they left the trailer a tremendous blast of air struck them. Mrs. Bennett saw her husband grasp a tree for support, then saw him lifted off his feet by the air blast and strung out "like a flag" before he let go. Before she lost consciousness she saw one of her children blown past her and a car tumbling over and over. Her son Phillip, 16 years old, was buffeted about by the air blast and immersed in water, but somehow, with a broken left leg, he managed to crawl into a clump of trees, where he burrowed into the mud for warmth. He and his mother, sole survivors of the family, were rescued the next morning.

Rev. E. H. Ost and his family were among the survivors at Rock Creek Campground. Awakened by the first tremor, the family left their tent. As they stood in the bright moonlight, about 20 seconds after being aroused, they heard a tremendous grinding noise and, with it, the sound of water. No wave of water was moving downstream; instead, Rev. Ost saw water moving upstream. He shouted to his family to hang onto trees. His daughters, alerted by the call, scrambled up slope. Water swirled through the campground, rolling and tumbling their car about 50 feet upstream, but Rev. and Mrs. Ost held firm to the trees and soon were able to pick their way out of the debris. With other survivors, they climbed to higher ground. Dawn revealed the east edge of the Madison Slide about 100 yards from the Osts' former campsite. By 6:00 a.m. all the cars in the campground were submerged beneath Earthquake Lake.

The house trailer of an elderly couple, Mr. and Mrs. Grover Mault, of Temple City, Calif., was carried some 200 feet upstream in the wave created by the Madison Slide. The water rose rapidly as the Maults tried to escape from the trailer, so rapidly that by the time they made their way to the door the trailer was almost completely submerged. They managed to get out and climb first onto its roof and then, as the trailer was inundated, into a nearby pine tree. The ever-rising water forced them to climb higher. Several times, when the boughs broke under their weight, they fell into the lake. Each time they climbed back. Just as daylight was breaking, they were rescued, after 5 hours in the tree.

At Ennis, Mont., about 50 miles downstream from Hebgen Dam, the major tremor aroused many of the residents. A few went outside to see what had happened; most merely went back to sleep. At about 2:45 a.m. a message reached Ennis that the dam had failed or was about to fail, and the authorities immediately began to alert the residents. Sirens sounded, and people went from house to house warning their neighbors and friends. The word swept through town. All residents were urged to move to higher ground as soon as possible. Most took a few prized possessions and drove to a high terrace at the west edge of town. By 4:00 a.m. Ennis was nearly deserted, and as the night passed may residents moved to still higher ground farther west. By dawn a large field in this new area was covered with cars.

The threat of flood still hung over Ennis on August 18, and by midmorning roadblocks had been established on State Highway 499 leading to the Madison River canyon. As the threat lessened, many residents wished to return to their homes, but the town officials, fearful that Hebgen Dam still might collapse, issued an official evacuation order to prevent their return. Most of the populace spent the rest of the day and that night camped out. The order was retracted on the afternoon of the 19th, and the residents returned to Ennis on the basis of a standing alert. The warning signal was to be the sounding of the siren. This was never used, for Hebgen Dam held firm.

At West Yellowstone, which was much closer to the epicentral area and therefore more intensely affected by the major shock than Ennis, the fear of additional severe shocks prevailed. Most of the residents left their dwellings at the time of the major shock and got into their cars. An amateur radio operator radioed: "The pavement looks like it is coming toward me in waves a foot high." The aftershocks kept people away from buildings, and many spent the night in their cars. In the early morning large numbers of tourists left the area via U. S. Highway 20 to Idaho--the only route not blocked.

The earthquake was felt in most of the surrounding communities as a moderate rolling and pitching motion. At Bozeman, Mont., about 60 miles north of the epicentral area, the major tremor jostled the community awake, and some residents heard a low rumbling roar in the ground. A few of the more curious went outside; most of the others, satisfied that their lights and telephones were still working, went back to sleep. At Butte, Mont., about 100 miles northwest of Hebgen Lake, the motion reminded one reporter of "negotiating a rough patch of water in a small boat." The tremor was first felt as a slight shaking which worsened and lasted about 30 seconds. At Ashton, Idaho, about 55 miles south of Hebgen Lake, most of the populace was shaken awake but no one was injured, nor was there any serious structural damage.

Published Article: *Earthquake* by Robert M. Burley published in proceedings of <u>Billings</u>

Geological Society; 11th Annual Field Conference; September 7-10, 1960

Experience of: Robert M. Burley Billings, Montana Location at time of earthquake: Beaver Creek Campground, Madison River Canyon

My Wife and I arrived at Beaver Camp ground, a favorite camping spot on the Madison River, at approximately 10 o'clock on the night of August 17. We set up our tent and had just gone to sleep when my wife was awakened by the earthquake. She woke me up screaming, "A bear or something is shaking our tent!" We both jumped up and stumbled through the tent door. At first, I thought it might be a violent wind storm; but when we got outside, we immediately realized what it was. Neither one of us could stand up, and we fell to the ground, clawing for something to hold onto. My wife thought it was the end of the world, and I was about ready to agree with her.

It was the most terrifying sight I have ever seen. The car was shaking up and down so violently I thought it would either go in the river or topple over onto us. All around us the trees were swaying with a terrific force, and the ground was trembling violently. The mountain directly across the river from us was covered with dust from the slides. I thought we would be engulfed by tons of rock at any moment. The terror that we felt for that minute and a half is indescribable. The mountains appeared to be smoking all around. We realized later that it was dust from the avalanches and rock slides.

We looked down the river toward the Rock Creek Camp ground and saw the mountain split with a huge cloud of dust. After that we could see nothing but the dust in that direction. Although we saw it, we didn't realize until later what had really taken place at the Rock Creek Camp ground.

We were afraid that Hebgen Dam, which was two or three miles upstream from us, might wash out and submerge us under tons of water. I grabbed our blankets and equipment and threw them in the car. My wife cried "Leave everything and let's go!" But I thought we might need our equipment later, which proved to be correct. We hurriedly loaded up and drove north toward Ennis.

We were somehow able to maneuver around the huge boulders and rock slides which were strewn on and near the road. By the time we got to the Rock Creek Camping area, it was apparent that we had been completely cut off by the slide. There were people on the road waving lights and screaming for help. Many of them were injured seriously and most of them had lost everything in the avalanche. We emptied the back seat of our car, distributing what blankets we had to those who were injured. Some of them were in a state of shock and were shivering from the cold.

We loaded up as many of the injured as we could and headed back, hoping to get above the dam. Just below the dam, cars were jammed, and we realized that we were isolated. The people there were organizing a camp in an area higher than the level of the dam. We unloaded the survivors into some of the other cars in order to get them warmed up. One of the men we transferred had his foot almost severed, and we were afraid to move him. Much to our relief there was a registered nurse present who helped take care of the injured. We tore up our pillowcases and such to use for bandages.

I tried to get some of the other men to go back down with me to pick up the other survivors. We got two more cars and went back down. By the time we got back to the Rock Creek Camp ground, the survivors had built a fire and most of them were up on the road. The camp ground was completely inundated with water which was backing up behind the avalanche.

There were ten to fifteen survivors gathered around the fire, and more were trying to make their way out of the avalanche. I went up to the foot of the slide and helped some men carry a crippled man off the slide.

Some of the survivors wanted to stay there by the fire, but we prevailed on them to move to higher ground since the water level was rising rapidly and would soon cover the camp ground. We loaded up all the survivors there in two other cars besides mine. I had five people and a crippled man's wheel chair piled on the outside of my car besides the survivors inside. We could hear people who had been caught in the river screaming for help, but we had to leave them for the time being.

On the way back up toward the dam, we crossed Beaver Creek bridge, which had been broken in two places and had moved on its foundation. It was still usable, but some of the men and I walked across it first for fear the extra heavy load might loosen it some more.

After disposing of the injured at the emergency rescue camp, another man and I gathered up life jackets and as much rope as we could find and headed back down to Rock Creek. We joined two other men who had already started on their way down to the area. After wading through water for about one mile, we finally reached Rock Creek Camp grounds.

We located the people in the river, and after splicing our rope together, we went out after them. A man from Nye, Montana, whom I was certainly glad to have with us, took the biggest life jacket, a rubber mattress, and headed out into the river on the end of the rope. The other man and I waded out as far as we dared to give him more rope; however, he could only get within 100 feet of the people. When we tried to bring him back in, the rope caught in some trees. We spent about an hour and a half getting him untangled. All the while the ground was shaking, the rocks were sliding, and there was a terrible thunder storm.

We succeeded in getting the man back to the fire where he stayed for the rest of the night talking to the people in the river. Meanwhile, another man and I went back up to the dam to try to secure a boat. Locating a boat at Hebgen Dam, we returned to the

disaster area. By that time, it had begun to get light. We could see the water covering the road for about three miles above Rock Creek Camp ground. We put the boat in the water and headed for the middle of the river. The debris was so bad I could understand why we almost lost our fellow rescuer the night before. We worked our way through the debris and located the people clinging to a tree. This was about 6:00 a.m.

It was an old man 71 years of age and his wife, who was 68. They were exhausted and just about frozen by the cold water. I believe that if we had gotten there 15 minutes later, they would have been gone. We took the old couple to shore immediately and built a fire to warm them. It was then that I could see for the first time the avalanche. There was a whole new mountain possibly 300 feet high across the valley.

We headed back to the new camping area shortly, for we thought we might be stranded as the water was rising rapidly. At the main camp, the people immediately took the old couple and dressed them in dry clothes.

The survivors were working together very smoothly by that time, as they always do in a crisis. Everyone had pooled their food together, and the ladies started breakfast.

During the day, there were numerous tremors and rock slides in the area. We could see the dust from the slides and felt the tremors almost constantly. Planes began to fly over the area and dropped messages to us. They set up a schedule to pick up the wounded with helicopters.

By this time we were getting reports on the car radios and were able to learn the extent of the damage. We knew we were trapped, and all we could do was wait for the rescue operations to begin.

Planes began to drop smoke jumpers and supplies around noon. About 2:00 p.m. the helicopters began picking up the injured. A doctor and two nurses had come in by boat that morning to administer first aid to the injured. We learned later that two of the injured had died at Bozeman hospital.

Food was dropped to us later in the afternoon and some of the survivors ate for the first time that day.

A Montana Highway Patrol car came in about 6:30 p.m. to let us know the road had been repaired to permit us to get to Bozeman. We took Mr. and Mrs. Jack Goodnough from Albion, Washington, and their three children with us to Bozeman. They had lost everything in the slide except what clothes they had on. The children were barefooted. Nevertheless, they were thankful to be alive after that horrible experience.

On the way to Bozeman, we could see the tremendous damage done by the quake. The road was under the lake in places, and in other places it had been torn from its foundation. There were faults 10 to 30 feet high back along the foot of the mountains. The lake looked as if it had shifted for several hundred yards. The dam had several

large cracks--how it held was a miracle. There was a large lake forming from the slide when we left. It covered most of the road.

In Bozeman, the people opened up their hearts to the stranded people and provided them with clothes, lodging, food, and even transportation plus that intangible something that ties people together in a crisis such as this.

Our deepest admiration and gratitude goes to those people who risked their lives to help the stranded people between Hebgen Dam and the slide, to the smoke jumpers, the army helicopter, the Civil Defense, the doctor and nurses who worked with the injured at the emergency camp, the Highway Patrol, and the road crews who worked through that stormy night and day to open up the road which seemed an impossible task in such a short time.

We also want to thank all our friends and the people who prayed for us. I do not believe we would have made it without them.

Published Article: A Doctor's Report, by R.G. Bayles published in <u>Billings</u> <u>Geological</u> <u>Society; 11th Annual Field Conference; September 7-10, 1960</u> Experience of: Dr. R. G. Bayles Bozeman, Montana

Location at time of earthquake: Apartment in Bozeman Hotel

A DOCTOR'S REPORT

At 11:37 p.m., Monday, August 17, 1959, when the first hard jolt of the earthquake struck, I was enjoying some much-needed sleep in my apartment in the Bozeman Hotel, where my professional and business offices are located. After being jolted from bed, I immediately switched on the radio to catch any news, but at that time it was too early for any reports. I dressed as quickly as possible and went down to the lobby where most of the guests were gathering, many still in their night clothes. Some were badly frightened, and a few on the verge of hysteria. After doing what I could to calm them my first thought was for the welfare of my employees at West Yellowstone, where I own the Stagecoach Inn, and also maintain a professional office. I tried to call but the telephone lines were down.

As the night wore on, the radio reports gave only a few vague, contradictory details, but confirmed that there had been an earthquake of major proportions. Through the sheriff's office, which was in communication via short-wave radio, I learned the shock centered in the west Yellowstone area, and all roads to this vicinity were blocked and several bridges out. There was also the report that Hebgen Dam was leaking badly and the Madison River rising. Ennis, Three Forks, Trident, and Townsend, small towns down the river, had been warned to evacuate. Before dawn several families from Trident registered into the hotel, and I later learned that many families from these towns spent the remainder of the night huddled on the hills outside if their respective towns.

At dawn, equipped with my medical bag, I chartered a plane from Flight Line Inc., piloted by Bob Winterowd for the flight to West Yellowstone. We attempted to fly directly toward Ennis, but encountered a severe thunderstorm and were forced to fly back and up the Gallatin Canyon and over the mountains, coming into the Madison at the lower end of the Canyon.

We had had no report of a slide and as the canyon came quickly into view we were completely appalled. The mountain on the south had fallen across the canyon. It was hard to comprehend the immensity of the slide and damage it inevitably had done. We circled down as close as possible. The whole area seemed to be green, due to uprooted trees laying crisscrossed like match sticks, except for the top part of the slide that had rolled up the opposite wall of the canyon like a giant ocean breaker. We estimated it to be one mile long and 250 to 300 feet deep where the road, river, and Rock Creek Campground had been. It was obvious that any people in the immediate vicinity had been killed or injured. On the upper side a lake was beginning to form. It had already reached the tops of some of the smaller evergreens along the river bank adjacent to the slide. Below the slide the river bed was nearly dry for some distance. However, from the air, it was apparent why the report that the river was rising rapidly and evacuation notices had been issued down river, since the water had been forced from beneath the slide with terrific force thereby temporarily greatly increasing the flow of water.

At a short distance, on the highest ground they could reach, a small group of people were gathered. They were desperately waving anything available to attract attention. We circled low to indicate that we had seen them and were aware that they were in desperate need of help, and also to try to determine if there were any injured among them. As we went farther up the canyon there was a large group of people, cars, tents, and campfires. As we approached Hebgen dam we could see the extensive damage to the dam. There were large cracks in the concrete core, the spillway was cracked and chunks broken out, and there was considerable damage to the dirt fill below the concrete. Another large group of people and cars was gathered on the roadway, where it widens out at the north end of the dam. Hebgen Lake, which was then very muddy and rough, was covered by thousands of logs which were just barely floating. The road just above the dam had completely disappeared into the lake for approximately 100 yards. The top of a house and other debris were floating where the road had been. Two large fault lines were clearly visible on the mountain. One was a short distance above the lake, the other higher up. Farther up the lake there were two more areas, each approximately 100 yards long, where the road had disappeared into the lake. The upper, or south, end of the lake had raised out of the water, and boat docks had either been swept away or were marooned in the mud far from the water. Cabins previously located on the edge of the lake were now hundreds of feet from shore. We later learned that this end of the lake had raised 8 feet sending cascades of water in the form of huge tidal waves over the dam, thus adding to the formation of the new lake.

The fate of the people completely trapped between Hebgen Dam and the slide, a distance of seven miles, was indeed precarious. The dam was expected to go out momentarily, there was danger of additional slides at any time, and waves with each new major tremor. There was no means of escape except by rescue by helicopters.

As we flew on toward West Yellowstone we saw where the fault in the earth crossed the highway at Duck Creek. Abutments to all three bridges were out.

As we approached West Yellowstone, we could see that considerable damage had been done to the town. Chimneys had fallen and many buildings were badly damaged. When we landed at the airport we found many people gathering there. They were as yet unaware of the tragic situation down the canyon.

From the airport I caught a ride the few blocks uptown to the Stagecoach Inn. There I found the few employees and guests who had not evacuated south into Idaho, huddled around a campfire under some pine trees across the street from the Inn. I spoke briefly with them and was told that the Inn had suffered serious damage. However, at that time, I was more concerned with the sorry plight of the people trapped between the dam and

the slide. The only employee left in the Inn was the manager, Jane Winton, who is a registered nurse. Without bothering to inspect the Inn for damage, I asked her if she was willing to fly back to the slide area with me to render what aid we could. She replied something to the effect, "that it would be a relief." We hurriedly gathered additional medical supplies and returned to the airport, where I asked Bob Winterowd if he was willing to fly back and attempt a landing. His reply was, "If you're willing, so am I." We flew back and managed to find a field large enough to land on at the Watkins Creek Ranch, located on the south side of the lake about three miles from the dam.

We walked about half a mile down the lake toward the dam through mud and debris thrown up by the tidal waves to a place where people were dragging their boats higher out of the water, which had risen eight feet at this end due to the tipping of the lake. These people believed the dam to be going out, and were reluctant to lend a boat. Finally, a young fellow, whose name I never learned, volunteered to take us across in his motor boat. It was impossible to dodge the trees and other debris, so we just went over the top of them, and prayed we wouldn't hit a snag. It was approximately 3 miles to the end of the dam where we landed. We then had to cross the cracks and crevices in the dam. The ground was still quivering.

A nurse, Mildred Greene, of Billings, Montana, who has since been featured in a Reader's Digest article about the guake, met us at the other end of the dam. She told us that no one had been there, and that they had had no word from the outside since the guake, more than 8 hours earlier. She had been camping in the area with her family. They had been a little above the major slide, so had not been injured. She had gathered all the more seriously injured into the area just along the highway end of the dam. There were 16 seriously injured, and she had them in the back of the station wagons, except for one couple in a fishing trailer. Among the injured was a woman whose left arm was nearly severed in two places; she had suffered a crushed chest and was in severe shock; a woman who had suffered three deep body wounds and a severe blow on her head; a man with painful internal injuries, a broken collar bone and severe lacerations; a man with deep lacerations over 90 percent of his legs; a girl with a crushed ankle; a woman with a broken vertebra; a small child with a gash over her eye, which at the hospital, required 32 stitches to close. There were many others with less severe injuries. Mrs. Greene had done wonderful work in the absence of drugs, medications, and even bandages. Not only that, she had kept them all under control and calm and quiet. We were there for one and a half to two hours, helping with the medications which we had brought for pain and shock.

All these people were badly in need of hospital care, so as soon as I had done everything I could, we recrossed the lake, hiked to the plane, and returned to West Yellowstone to alert the hospital via short wave, and help set up the air rescue. The injured couldn't be taken out by boat, since they were too badly hurt to be transported that way, and the lake was too dangerous. No roads were open so it was a matter of getting them out by helicopter. Shortly after noon, an Air Force helicopter and other planes arrived. The helicopter flew the first load of injured to the West Yellowstone airport where they were immediately loaded onto the floor of a converted B-18, and flown to Bozeman. The helicopter shuttled back and forth from the dam to the airport, and planes from the Johnson Flying Service flew these additional loads down. There was a fleet of station wagons at the airport there to rush them to the hospital. The 16 most seriously injured were in the Bozeman hospital by early afternoon. I made several trips down and back with the planes. Two of these injured later died at the hospital. If the medical attention had reached them sooner they might have lived. However, several others might have died if medical attention had been longer delayed.

While we had been making our hazardous crossing of the lake, above the shaky dam, the old World War II slogan, "Is this trip really necessary?", kept popping into my head. As it turned out, it was, and I shall always be glad I made it.

Excerpt from: The Night The Earth Shook; A Guide To The Madison River Canyon Earthquake Area; U.S. Department of Agriculture Forest Service, August 1962 Experience of: R. F. Bennett family Coeur d'Alene, Idaho Location at time of earthquake: Campground in Madison River Canyon

One of the more tragic incidents involved the F.R. Bennett family of Coeur d'Alene, Idaho. Mr. and Mrs. Bennett and their four children, en route to Yellowstone National Park, reached the western end of the Madison River Canyon late in the afternoon of August 17 and decided to spend the night there. Mr. and Mrs. Bennett occupied their house trailer, while the children slept in bedrolls nearby. The Bennetts were awakened by the jiggling of the trailer and wondered what had caused it. Some time later, Mrs. Bennett recalls, she heard a tremendous roar, and she and her husband, alarmed, left the trailer to check on the children. Suddenly they were struck by a violent blast of air. Mrs. Bennett saw her husband grasp a tree for support; then as his feet were swept out from beneath him, he was strung out "like a flag" for a moment before his hold was broken and he was blown away. Before Mrs. Bennett lost consciousness, she recalls seeing one of her children blown past her, and a car being tumbled along by the air blast

Philip Bennett, her son, was buffeted by the wind and washed downstream by a wave of water. Although his leg was broken, Philip managed to crawl into a clump of trees, where he burrowed into the mud for warmth and awaited daybreak.

Mrs. Bennett and Philip, the only survivors, were rescued early next morning and taken to the hospital at Ennis, Mont.

Excerpt from: The Night The Earth Shook; A Guide To The Madison River Canyon Earthquake Area; U.S. Department of Agriculture Forest Service, August 1962 Experience of: Lewis Smith family Greeley, Colorado Location at time of earthquake: Beaver Creek Campground, Madison River Canyon

The Lewis Smith family of Greeley, Colo., camped at the Beaver Creek campground, about two and a half miles downstream from the dam, were awakened by the major tremor. Cognizant of their precarious position below the dam, Smith hurried his family into their clothes, and drove away, abandoning his house trailer. At highway 287 he had two choices. He could turn northeast and drive toward the dam for two and a half miles until he reached the high ground near the dam; or he could turn southwest and drive five miles down and through the Madison River Canyon.

Smith decided to turn southwest. He drove down the canyon until halted by a large boulder in the road. Still fearful that the dam would break, the Smiths left the car and scrambled up the mountain flank to higher ground. They spent a cheerless night listening to boulders tumble down the mountainside. At dawn they saw that the boulder blocking their car was part of the immense mass of the Madison Slide.

Returning to the car, Smith heard a radio news report that the collapse of Hebgen Dam was imminent. He therefore drove his car as far as he could up a small knoll, and climbed back to his family.

The Smiths were rescued by helicopter the next day, August 18. The car was gradually submerged as the waters penned behind the slide rose to form Earthquake Lake.

Excerpt from: <u>The Night The Earth Shook; A Guide To The Madison River Canyon</u> Earthquake Area; U.S. Department of Agriculture Forest Service, August 1962

Experience of: Rev. Mr. E.H. Ost and family New York City, New York Location at time of earthquake: Rock Creek Campground; Madison River Canyon

When the slide came to rest, its northeastern (or upstream) edge was about 100 yards away from a campsite occupied by the Rev. Mr. E.H. Ost and his family.

The Rev. Mr. Ost and his wife were awakened by the major tremor and stepped out of their tent to see what had happened. They stood in the moonlight for about 20 seconds looking about; then suddenly they heard a terrifying grinding and roaring noise intermingled with the sound of rushing water. Alarmed, Mr. Ost at first thought that a wave of water was coming downstream. None was, but when he glanced downstream he was astonished to see a wall of water racing toward him! He called to his family to hang onto trees and he and his wife did so while the water swirled around them. Their daughters fled about 50 feet and were not touched by the water. When the wave had passed, Mr. Ost and his family struggled up the mountain flank away from the rising water. They were joined by other survivors and all were rescued the next day.

Excerpt from: <u>The Night The Earth Shook; A Guide To The Madison River Canyon</u> Earthquake Area; U.S. Department of Agriculture Forest Service, August 1962

Experience of: Mr. and Mrs. Grover Mault Temple City, California Location at time of earthquake: Rock Creek Campground; Madison River Canyon

Once the valley was blocked, the waters that crested Hebgen Dam as a result of the seiche, plus the waters normally released through the spillway at the dam, were impounded east of the slide and Earthquake Lake began to form.

Mr and Mrs. Grover Mault of Temple City, Calif., were almost drowned by the rising waters of Earthquake Lake. They spent a miserable, forlorn, and frightening night in the branches of a tree, watching the waters of the new lake slowly rise.

The sudden surge of water at the time of the slide trapped the Maults in their trailer. As they tried to escape, the rising waters carried the trailer about 200 feet upstream before lodging it against some rocks. Although the trailer was almost completely submerged by then, the Maults managed to clamber onto the roof. As the waters rose, they abandoned the trailer and climbed into a nearby pine. The ever-rising water forced them to move higher and higher where the limbs were smaller. Time after time, boughs broke and dropped them into the water. Each time they climbed back into the tree. Many who stood by helpless remember their repeated calls for help. During the night several attempts to locate and rescue the couple were made by Mr. Frank Martin of Virginia City, Mont.--who used an inflated air mattress in lieu of a boat! At daybreak Mr. Martin located a boat and helped the couple ashore. The Maults had spent more than 5 hours in the tree.