

REPORT OF BOARD OF REVIEW

Mann Gulch Fire

Helena National Forest - August 5, 1949

Missoula, Montana

September 29, 1949

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SAFETY  
Mann Gulch Fire  
8/5/49

Missoula, Montana  
September 29, 1949

#### Date of Accident

On August 5, 1949, a crew of 16 firefighters, 15 of them smokejumpers, became entrapped on the Mann Gulch forest fire on the Helena National Forest in Montana. As a result, 11 men were burned to death and 2 additional men died the next day from burns. Three members of the crew, one the foreman in charge, escaped without serious injury.

#### Preliminary Investigation

By August 7, there was under way an investigation of the catastrophe, headed by the Chief of the Division of Fire Control and the Safety Officer from the Office of the Chief, Forest Service in Washington. Later Chief Watts designated a special board to review the findings of these investigators and otherwise to make the best possible determination of the circumstances contributing to the tragedy.

#### Formal Board of Review

On September 26, the Board of Review assembled at Missoula, Montana, the headquarters of the Forest Service, Region One, in which the Helena National Forest is located. After a short organization session, the Board was flown on that day to the scene of the fire, accompanied by Regional Forester Hanson, Assistant Regional Forester Crocker, Foreman Dodge, Spotter Cooley, Ranger Jansson and Carl Gustafson, Chief of the Washington Office Division of Fire Control, who had conducted the preliminary investigation mentioned in the previous paragraph.

Several loops were flown around and across Mann Gulch, during the course of which significant points on the ground were pointed out and the topographic features and cover types were observed. At the completion of the aerial survey, the party was landed at Helena, whence it was taken by car and boat to the mouth of Mann Gulch. Approximately 3 hours was spent going over the ground, visiting the main points of significance, such as the parachutists' landing area, the equipment dump and the area where the deaths occurred. Ranger Jansson and Foreman Dodge explained the location and behavior of the fire and their respective actions as the various points were visited. A close-up view of topographic, surface and cover conditions was obtained.

During the next several days hearings were held at the Regional Forester's office in Missoula, during the course of which all key witnesses were heard. In keeping with the Chief's charge to the Board, particular attention was given to matters having a bearing on the following questions:

1. Were the weather conditions on August 5 of a character that would make the employment of smokejumpers unusually hazardous?
2. Was there available near the fire a suitable landing area, and was such an area selected?
3. Were the general topographic and cover conditions, and the fire behavior at the time of jumping, of such nature as would render unwise the placement of a crew where it was placed?
4. Was there delinquency on the part of the fire overhead to warn the crew of known impending danger?
5. Was there a failure of judgment or leadership on the part of the foreman due to insufficient training or otherwise?
6. Had the crew members been trained in the various phases of firefighting, including escape techniques?

In its report, the Board proposes to present:

- A. A brief history of the action on the fire having a significant relationship to the matters under review.
- B. Its conclusions concerning the questions listed above.
- C. Its recommendations as to measures which it believes may be helpful in guarding against similar occurrences in the future.

Membership of the Board of Review

C. M. Granger, Assistant Chief, Forest Service, in Charge of National Forest Administration - Chairman

H. D. Cochran, Chief, Division of Personnel Management, Office of the Chief, Forest Service

Jay H. Price, Regional Forester, North Central Region

Lawrence K. Mays, Assistant Regional Forester, in Charge, Division of Operation, Pacific Northwest Region

J. Malcolm Loring, Forest Supervisor, Chelan National Forest, Pacific Northwest Region

Technical Advisors

C. A. Gustafson, Chief, Division of Fire Control, Office of the Chief, Forest Service

Francis Lufkin, Smokejumper Foreman, Chelan National Forest, Pacific Northwest Region (Advisory Smokejumper Foreman)

Witnesses

J. Robert Jansson, District Ranger, Canyon Ferry District, Helena National Forest, Northern Region

Arthur D. Moir, Jr., Forest Supervisor, Helena National Forest, Northern Region

Frederick M. Fite, Regional Fire Dispatcher, Division of Fire Control, Northern Region

Ralph L. Hand, in Charge of Fire Planning, Division of Fire Control, Northern Region

Favre L. Eaton, Assistant Forest Supervisor, Helena National Forest, Northern Region

Earl E. Cooley, Parachute Project Administrative Assistant ( Fire Technician) Division of Fire Control, Northern Region

Elmer P. Bloom, Photographer (Motion Picture), Division of Information and Education, Northern Region

Kenneth Huber, Pilot, Johnson Flying Service (Government contractor), Missoula, Montana

Robert W. Sallee, Smokejumper-Fireman, Parachute Project, Division of Fire Control, Northern Region

Walter B. Rumsey, Smokejumper-Fireman, Parachute Project, Division of Fire Control, Northern Region

R. Wagner Dodge, Foreman of Parachute Squads, Parachute Project, Division of Fire Control, Northern Region

Sidney E. McLaughlin, Regional Personnel Officer, Division of Personnel Management, Northern Region

Fred I. Stillings, Parachute Project Administrative Officer, Division of Fire Control, Northern Region

Clyde D. Blake, Assistant Regional Training and Safety Officer, Division of Personnel Management, Northern Region

Seth Jackson, Safety Officer, Division of Personnel Management, Chief's Office

Ralph S. Space, Assistant Chief, Division of Fire Control, Northern Region

Percy D. Hanson, Regional Forester, Northern Region

LaVaughn Beaman, Regional Fiscal Agent, Northern Region

### Invitation to Relatives and Points Raised

An invitation was extended to relatives of the victims living in Missoula and Kalispell, Montana, to appear before the Board if they wished to do so. The only one who availed himself of this opportunity was Mr. Henry Thol, who appeared before the Board for approximately one hour the morning of September 29.

The principal points made by Mr. Thol were:

1. The jump should not have been made at that time of day in an area presenting the topographic conditions and character of fuel which existed there, because it should have been evident to those in responsible positions that a blow-up might take place at any moment which would engulf the entire Mann Gulch area.
2. The jump having been made, Dodge should have taken his crew out of the area by the shortest route over the ridge at the time he rejoined the crew after contacting Harrison, instead of proceeding toward the river.
3. Dodge's plan of attacking the fire on the lower flank on the Mann Gulch side nearest the river was wholly impractical, because it would have been impossible to hold the fire on the slope where it was at the time.
4. The assertion in the Chief's letter of August 30 to Senator Murray that the fire was not spreading rapidly at the time of the jump was incorrect, because Thol regarded the increase in the size of the fire from nothing in evidence at 11:25 a.m., to an estimated area of 50 to 60 acres at 3:10 p.m., as rapid spread.
5. Dodge's action in setting the escape fire was not effective as a means of salvation for the crew, because the crew was not close enough to Dodge to have his purpose explained to them in time; but on the other hand, the escape fire actually impeded or frustrated the efforts of at least some of the men to escape over the ridge.
6. Thol challenged the statement in letter of August 30 from the Chief of the Forest Service to Senator Murray, that the members of the crew were seasoned firefighters. He pointed out that many of them had certainly had experience only on small fires.
7. Thol contended that the jump spot was ahead of the fire rather than on the flank, as asserted in the letter of August 30 from the Chief of the Forest Service to Senator Murray.

It is the feeling of the Board that all these contentions have been fully weighed and are covered in the Board's conclusions.

## History of the Mann Gulch Fire

(This factual history is based upon a report prepared by the regional forester, supplemented and confirmed by a preliminary investigating committee headed by C. A. Gustafson, Chief, Division of Fire Control, from the Washington Office, and by testimony before the Board of Review.)

1. Name of fire: Mann Gulch Fire, Helena National Forest, Montana. August 5 to August 10, 1949.
2. Location: The fire was located in the "Gates of the Mountains" wild area (roadless area) just east of the Missouri River, some 20 miles north of Helena, Montana. The fire started in the NE $\frac{1}{4}$ -NE $\frac{1}{4}$  Sec. 19, T. 13 N., R. 2 W, Montana Principal Meridian, at a point near the top of the ridge between Mann and Meriwether Gulches. The general area is steep and jagged on the Meriwether side and is said to be one of the roughest areas east of the Continental Divide. The exposure is generally northwest. The point of origin of the fire was accessible from the road end at Hilger Landing, just off U. S. Highway 91, thence by a 6-mile motorboat trip to Meriwether campground at the mouth of Meriwether Gulch, thence about a 1-hour hike on a trail over rough terrain.
3. Fuel type: At the point of origin the fuel type consisted of a dense stand of 6- to 8-inch diameter Douglas fir and some ponderosa pine poles. In the pole stand were occasional large Douglas fir and ponderosa pine trees. This type merged into one consisting of larger timber, mainly Douglas fir with stringers of ponderosa pine on the lateral ridges. The ground cover in the openings and in the less dense timber was a mixture of grass and weeds of medium density.  
  
At the point of disaster the tree cover consisted of stringers of scattered young ponderosa pine trees with occasional over-mature ponderosa pine trees. The ground cover or understory which predominated was bunchgrass with some cheatgrass.
4. Weather: The day the fire started a temperature of 97 degrees was recorded at Helena. At the Canyon Ferry Ranger Station, 20 miles from the fire, the following was recorded at 5 p.m.: humidity 22 percent, wind 16 miles per hour, fuel moisture 5.9 percent. These factors indicated a burning index of 74, with 100 as the maximum which could be measured. Reports from other locations gave wind direction and intensity as variable, which also indicated bad burning conditions about the time of the blow up. Fire danger on August 4 was 16 which indicated a very low rate of spread potential the day the fire started.
5. Manning. The planned fire organization on the Helena National Forest, as indicated by the fire danger, was in place. In addition to the lookout detection system, the forest maintained a complementary air-detection patrol.

Mann Gulch was observed from the air between 5 and 7 p.m. on August 4.  
The fire was discovered.

Discovery and reporting: The fire was first reported by Don Barker, lookout on Colorado Mountain, some 30 miles away. He reported it to the fire dispatcher in Helena at 12:25 p.m., August 5. The fire was also observed by District Ranger J. Robert Jansson at the same time. He had just returned to Helena from an air-detection patrol flight and noticed the smoke from the airport. He flew over the fire at 12:55 p.m., with Ranger Alternate Hersey and a pilot. The fire was then estimated to be about 50 acres in size and smoking strongly. Another smoke, later designated as the York fire, was discovered and scouted during this flight. It was located about 9 miles south of the Mann Gulch fire.

Action: Upon returning to Helena at 1:30 p.m., Jansson discussed the fire situation with Supervisor Moir. They mutually agreed to order smokejumpers because of the difficulty of getting local ground forces to the fire rapidly. Jansson, as soon as he reached the airport, also requested that 50 local firefighters be sent to the fire. The original request to the fire desk in Missoula was for 25 smokejumpers. Due to the extremely rough topography of the general area and the seriousness of the fire weather, the best overhead available was selected for this mission. Because of the lack of adequate airplane transportation, only 16 men were sent. (Planes were servicing other fires in the region and were not immediately available. A Douglas C-47 plane can carry only 16 equipped jumpers.)

They left Missoula at 2:30 p.m. and reached the fire locality at 3:10 p.m. One man became ill enroute, so only 15 men jumped. Following routine procedure, before any jumper left the ship, the spotter and foreman carefully observed the fire, the unburned fuel, the geography and fire conditions while circling the fire. The wind at this time maintained itself steadily, blowing the fire towards the top of the ridge and nearly parallel with it. It apparently had maintained this course since the fire started, as indicated by the directional spread of the fire. This was parallel to Mann Gulch. The contemplated jump was considered to be of routine nature. It was not different from the normal day-by-day action of the smokejumper organization. The jump spot was agreed upon by Spotter Cooley and Foreman Dodge as suitable and safe. The fire was then about 50 to 60 acres in size.

The personnel jump and cargo dropping were completed by 4:08 p.m. The plane was unable to contact the Helena National Forest by radio, thus making it necessary for Spotter Cooley to report the execution of the jump by telephone to the Helena office at about 5:15 p.m., after returning to Missoula.

In the meantime, Jansson had left Helena for the fire at 2:20 p.m. with 10 men. He was followed by Ranger Alternate Hersey and 9 men. Due to water transportation difficulties, these men did not reach Meriwether campground, the nearest boat landing point to the fire, until about 4:30 p.m. Jansson

instructed Hersey to take the crew and "proceed up Mann Gulch trail, break out on top of the ridge between Mann Gulch and Meriwether, and to hold as much of the fire as possible on the ridge." Jansson then went down river to scout the fire. There was too much smoke to see anything from the river, so he left the boat and started walking up Mann Gulch at 5:02 p.m. He walked up to where the fire had crossed to the north of the gulch in two places. He thought he heard voices above him and continued up the gulch in an effort to determine the source. He listened further and concluded it was not voices he had heard. The fire at this time became so hot and was spreading so rapidly that he was forced to turn back at about 5:20 p.m., and discovered the fire had cut him off from below. He had to go through the fire to save himself. He fainted from holding his breath while running through the fire, but fortunately recovered a short time later outside the fire and proceeded to Meriwether.

Smokejumper Foreman Dodge's statement shows the men landed successfully in the bottom and near the head of Mann Gulch shortly after 3:50 p.m., with the exception that Dodge received a minor elbow injury. The jump spot was about a half mile from the northeast corner of the fire. The cargo (tools, water, and food) landed without damage except for the radio. This was made inoperable when the chute failed to open. (It is not possible to say whether or not lack of radio had any effect on subsequent action.) The smokejumpers' cargo and gear were assembled at the camp site located below the jump area by 5 p.m.

Concerning the fire at that time, Smokejumper Robert Sallee says, "I took a look at the fire and decided it wasn't bad. It was burning on top of the ridge and I thought it would continue on up the ridge. I thought it probably wouldn't burn much more that night because it was the end of the burning period and it looked like it would have to burn down across a little saddle before it went up hill any more."

The assembling of the cargo and the time involved, along with Sallee's statement, indicate no undue concern by the men over their immediate safety.

Recreation and Fire Prevention Guard Harrison had been instructed by Jansson that morning to start a patrol by 11 a.m. and to return and report to the Canyon Ferry Ranger Station from the Meriwether Camp by 3:30 p.m. Evidence shows Harrison probably tried to radio to Canyon Ferry and Missoula about the fire at 12:15 p.m. but was unsuccessful, thus delaying detection by 10 minutes. According to Dodge's verbal statement made later, Harrison said he had left Meriwether in accordance with instructions, proceeded along his patrol route and observed the fire. He then returned to Meriwether Station, tacking a note on the door reading, "Gone to the fire. Jim." He then proceeded to the fire. He was heard shouting near the fire by Foreman Dodge at about 5 p.m. Dodge, thinking it necessary to find out the reason for the shouting, instructed Squad Leader Hellman to get the crew equipped and follow him to the fire. Dodge proceeded alone, in advance of his crew, and met Harrison near the top of the ridge at the head of the fire a few minutes later.

Dodge determined that this particular location was not best for attacking the fire, from a safety standpoint especially, so he returned with Harrison and met Hellman and the crew who were hiking in to the fire according to the pre-arranged plan. Dodge at that time instructed Hellman to take the crew across to the north side of Mann Gulch and proceed down Mann Gulch to the river, following about on the contour which would take them out of the gulch as they went. Dodge and Harrison returned to the cargo location where they obtained water, rations, and equipment. Dodge again observed the fire and saw that it was starting to burn more rapidly. They proceeded down the gulch and overtook Hellman and the crew at about 5:40 p.m. Dodge then stopped and checked the crew. All were present. He put Hellman at the back end; Dodge took the lead.

They continued in the same direction towards the river for an additional 5 minutes, at which time Dodge noted that the fire was burning below them on the north side of Mann Gulch and up the ridge before them. Finding that the route towards the river was cut off by the advancing fire, they doubled back and climbed towards the top of the ridge to the north of Mann Gulch. After proceeding in this direction for approximately 1,500 feet, at as fast a pace as the terrain would permit, Dodge concluded that it would be better for the men to lighten their loads so he directed them to discard their heavy equipment. (It was noted by the investigators that practically all the equipment was found within a circle of 100 feet in diameter; hence it is concluded that all the men were together at this point.) At this spot, the fire was about 500 feet behind them so they angled more towards the top of the ridge north of Mann Gulch, and upon topping a small side ridge, came out of the timber onto a small, grass-covered slope with an occasional ponderosa pine tree. Dodge concluded that the fire was too close to continue further. He reports, "At this point, I stopped the crew and explained to those nearest me (at least 8 men) that we would have to burn off a section of the light fuel and get into the inside in order to make it through. In my opinion, all of my men were still with me or very close." This was located some 200 feet below the top of the ridge. Dodge further explained, "After setting a clump of bunchgrass on fire, I made an attempt to start another but the match had gone out and upon looking up I had an area 100 feet square that was ablaze. I told the men nearest to me that we would wait a few seconds to give it a chance to burn out inside and then we would cross through the flames into the burned area where we could make a good stand and our chances of survival were more than even."

Dodge then walked around to the north side of the fire he had started as an avenue of escape. He called to the men to go into the burned area, but was unsuccessful in getting them to do so. He then walked through the flames into the burned area for about 30 feet, lay down, and continued to call the men to join him. (The identical spot Foreman Dodge occupied has been definitely located and marked.) At this time, the main fire was very close to the spot that Dodge had fired to provide a retreat area, but there was yet a fairly large unburned area to the northeast and below them. The head of the fire had also formed a pincer ahead of them. The men had to make their decision in almost a split second, whether to seek safety by going through the flames at

the edge of the fire which Dodge had started, or go on through the unburned area and seek safety elsewhere. They chose the latter, with Sallee and Rumsey just making it to a rock slide about a thousand feet beyond and over the ridge. Within seconds after Dodge walked into the burned area left by the escape fire, at about 5:55 p.m., the main fire passed over. (A recovered watch stopped at 5:57 p.m.) This lasted approximately 5 minutes. By the time Dodge was able to sit up within the burned area and look at his watch it indicated 6:10 p.m. At that time, he heard someone calling and upon investigation located Sylvia approximately 100 feet below and 200 feet to the east of his location. He was badly injured. After making Sylvia as comfortable as possible, Dodge started for help. He traveled through his escape burn to the top of the ridge where he met Sallee, who told him Rumsey was all right and that Hellman was a short distance away, badly injured. The area was full of smoke, and no other survivors responded to calls.

About 6:30 p.m., Dodge and Sallee started for help, leaving Rumsey with the two injured men. They arrived at Meriwether camp at 9 p.m. It was then that the catastrophe became known to others. Jansson radioed for medical assistance at 9:20 p.m. Supervisor Moir made arrangements for doctors, ambulances, and medical supplies to leave Helena immediately.

During the time this tragedy was occurring, Ranger Jansson was enroute to Meriwether camp from the mouth of Mann Gulch. He met Supervisor Moir enroute and at about 5:45 p.m., they went downstream in a motorboat to scout the west side and northwest corner of the fire. They returned to Meriwether camp, and Moir left for Helena at approximately 6:45 p.m. to make arrangements for manning this fire and the York fire (another fire near York, Montana).

At about 8:00 p.m. a member of Hersey's crew came to the Meriwether camp for water. He said the smokejumpers had not joined them. Jansson sent instructions to Hersey to return with his crew to Meriwether. Hersey reached camp around 10:10 p.m.

Jansson organized a rescue crew which left Meriwether camp when the doctors arrived. They landed at the spot where Dodge and Sallee reached the river near the mouth of the first gulch downstream from Mann Gulch. At 11:30 p.m., August 5, they retraced the route to the injured men.

At midnight, Hellman's water supply had been consumed so Rumsey started for the river to get some. He saw lights coming up the gulch. He called out, received an answer, and waited. It was Jansson, two doctors and several others. Hellman was given plasma at 12:45 a.m., August 6. When it became lighter, he was carried down the mountain. They reached the river at 6 a.m. He died in St. Peters Hospital in Helena about noon.

The rescue party crossed the ridge into Mann Gulch at 1:20 a.m., August 6. At 1:50 a.m., they reached Sylvia and gave plasma to him. The doctors recommended waiting until daylight to move him. They left at 4:40 a.m., and reached the mouth of Mann Gulch at 6 a.m. He died in St. Peters Hospital in Helena about 10 a.m.

Search for the missing men continued until all were found. Dodge remained on the fire until all bodies were identified. The last one was flown to Hilger Landing by helicopter about noon, August 7.

Large fire action: Regional Forester Hanson, Fire Control Chief Crocker, Strong and DeJarnette from the regional office reached Helena at 3 a.m., August 6. Hanson immediately headed up search and evacuation activities.

During the night of August 5 and early morning of August 6, it became evident that the Mann Gulch fire had become what is termed a "project fire" which required large crews for control. Action was then initiated to bring in large organized firefighting crews and the required overhead. Mobilization of firefighters and transportation was difficult. Upon Forest Service request, the Spokane Air Force Base (Washington) and the Great Falls Air Force Base (Montana) supplied five transport planes. Two hundred trained firefighters were called from forests near Lewiston, Coeur d'Alene, and Moscow, Idaho, and were flown to Helena, a distance of about 230 miles. Firefighters were recruited at Helena and brought by truck from other points. A volunteer group of local farmers and ranchmen also fought the fire. Men from the U. S. Reclamation Service, Montana State Highway Patrol, and Army Air Force Base at Great Falls were rushed to the fires in the Helena area.

Crew leaders and other experienced Forest Service foremen came from the Cabinet National Forest (Thompson Falls, Montana), the Flathead National Forest (Kalispell, Montana), the Gallatin National Forest (Bozeman, Montana), the Beaverhead National Forest (Dillon, Montana), and the Lolo National Forest and Regional Office (Missoula, Montana).

A 10-mule pack string was sent to Helena by truck from the Forest Service Remount Depot near Missoula, a distance of 170 miles.

Five fire camps were occupied during the course of the control of the Mann Gulch fire. They were: Meriwether, Elkhorn, Willow Creek, Kennedy Springs, and Willow Mountain. The latter two were supplied entirely by air.

A total of 450 men worked on the fire.

Communication was by short-wave radio. The State of Montana, Montana Power Company, and Forest Service facilities were used.

Spread of the fire was stopped, and it was practically under control on Sunday, August 7. The completed control, including fire lines around several very inaccessible "stringers" in the high crags, was established August 10. The total burned area was estimated to cover 5,000 acres.

9. Type and location of accident: On August 5, 1949, at about 6 p.m., 11 forest firefighters died on the Mann Gulch fire, Helena National Forest. Two additional men were injured so severely that they died the next day in a Helena hospital.

10. Men who lost their lives were:

- |  |                  |              |   |   |
|--|------------------|--------------|---|---|
| 1. William J. Hellman, smokejumper squad leader, | died in hospital |              |   |   |
| 2. Joseph B. Sylvia, smokejumper                 | "                | "            | " | " |
| 3. Eldon E. Diettert,                            | "                |              |   |   |
| 4. Henry J. Thol, Jr.,                           | "                | died on fire |   |   |
| 5. Leonard J. Piper                              | "                | "            | " | " |
| 6. Stanley J. Reba,                              | "                | "            | " | " |
| 7. David R. Navon,                               | "                | "            | " | " |
| 8. Robert J. Bennett,                            | "                | "            | " | " |
| 9. Marvin L. Sherman,                            | "                | "            | " | " |
| 10. Philip R. McVey,                             | "                | "            | " | " |
| 11. Newton R. Thompson,                          | "                | "            | " | " |
| 12. Silas R. Thompson,                           | "                | "            | " | " |
| 13. James O. Harrison, smokechaser,              | "                | "            | " | " |

11. Survivors:

- |   |          |  |
|---|----------|--|
| R. Wagner Dodge, foreman of smokejumpers, | survived |  |
| Robert W. Sallee, smokejumper,            | "        |  |
| Walter B. Rumsey,                         | "        |  |

## conclusions

1. Fire conditions in that locality, the character of the country, and *The* location and behavior of the Mann Gulch fire at the time of the jump presented no indications of dangerous conditions beyond those often encountered by suppression forces which should have ruled out placing the smokejumpers in the area.
2. The jumper crew was headed by experienced and capable men, Dodge and Hellman. A statement covering the kind and length of experience of Dodge and Hellman in fire work is in the Appendix.
3. The jump area was carefully selected by Cooley and Dodge, and there was nothing to indicate more than average hazard, either with relation to the safety of the jump or proximity to the fire. A statement covering the kind and length of experience of Cooley in fire work is in the Appendix.
4. The jump, cargo-dropping operation and the assembly of the crew and cargo on the ground were carried out in normal manner except for the loss of the radio which was destroyed when the parachute failed to open.
5. Dodge's decision, after contacting Harrison and rejoining his crew, to proceed with the crew to the river in order to put his crew in a safe place, and to provide a means of safe retreat if it appeared feasible to attack the fire on the Mann Gulch flank nearest the river, was logical as was also his choice of the route taken by himself and crew along the slope on the north side of Mann Gulch, from which they could watch the action of the fire on the opposite slope, while proceeding toward the river. The sudden explosive runs of the fire from the upper slope of the ridge between Mann Gulch and Meriwether Canyon across the lower end of Mann Gulch could not reasonably have been expected.
6. There is no evidence of confusion until the time of failure to heed Dodge's efforts to get men to go into the escape fire area.
7. The evidence is not conclusive as to how many of the crew understood Dodge's purpose in setting the escape fire and heard his directions to join him inside the burned area. The situation was complicated by the noise of the main fire and possibly by the remark of one victim, as heard by some of the men, "To hell with this, I am getting out of here." Evidently each individual followed either his own instincts at this point or the example of those ahead of him who were making their way up or across the slope.
8. Dodge showed coolness and good judgment in setting the escape fire. Both survivors and Sylvia said they believed that all the men would have been saved if they had followed Dodge's lead in getting into the area burned by the escape fire.

9. All evidence available to the Board indicates that the escape fire in no way impeded the progress of the men seeking to attain the ridge, or was otherwise instrumental in causing or contributing to any of the deaths.
10. Ranger Jansson, upon learning from Dodge of the injuries to Hellman and Sylvia, displayed good judgment and fortitude in the rescue operations.
11. Regional Forester Hanson and various members of his staff ably directed or conducted the search for and removal of the bodies, notification of relatives, assistance in funeral arrangements, giving out information, and handling related matters.
12. It is the over-all conclusion of the Board that there is no evidence of disregard by those responsible for the jumper crew of the elements of risk which they are expected to take into account in placing jumper crews on fires. However, the Board feels that there are elements of this catastrophe which indicate the need for intensified study and training in fire behavior, and in the training of men in meeting fire emergencies. The Board makes the following specific recommendations:

Recommendations

1. The Board recognizes that training of jumpers and other regular fire suppression personnel has included instructions on how to recognize dangerous conditions and the importance of following leaders in emergencies, but feels that even greater emphasis could profitably be given in firefighter training to both of these factors.
2. The Board recognizes that the system necessarily employed of rotating jumpers and the varying size of the crews makes it difficult to maintain close acquaintanceship between leaders and jumpers, but feels it important to develop such acquaintanceship as fully as possible, as one means of establishing confidence in the leaders, so essential in emergencies.
3. Include in training the use of escape-fire method of avoiding catastrophe, even though occasions for and opportunity to use this method are relatively rare.
4. Continue and intensify efforts in the study of fire behavior to furnish more dependable basis for anticipating and predicting blow-ups, and intensify training of firefighting overhead in this respect.

Approved: Oct. 6 1949

[Signature]  
Chief, Forest Service

By authority of the Board:

[Signature]  
C. M. GRANGER  
Assistant Chief, Forest Service

## APPENDIX

1. The following photograph, oblique aerial pictures and diagrammatic sketch depict details of the Mann Gulch Fire, Helena National Forest, August 5, 1949.

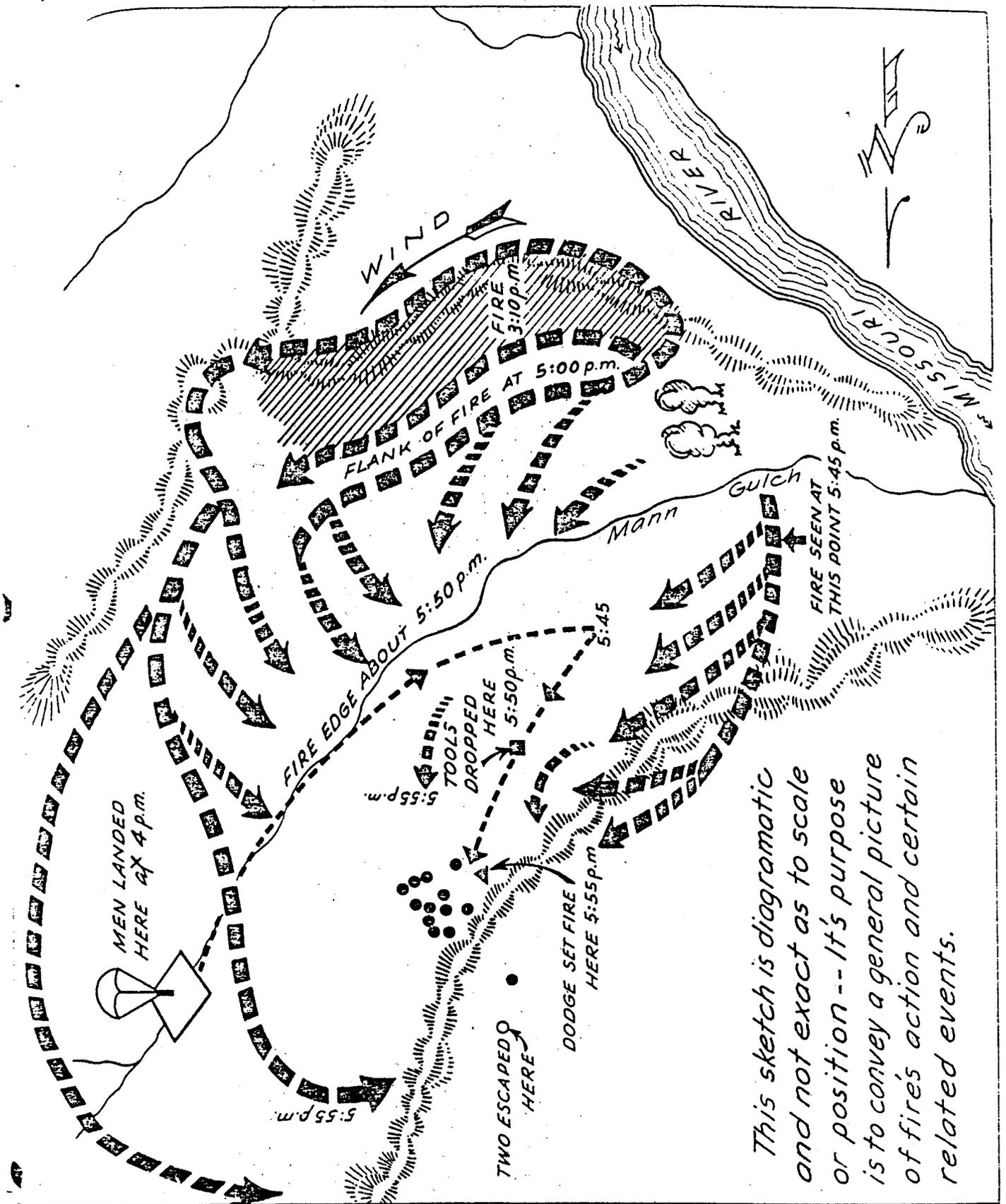
a. Sketch No. 1 diagrammatically shows the movement of the fire from 3:10 p.m. until the disaster occurred; the general line of travel of Dodge and his crew prior to and after blocked from reaching the river; the general location of the tragedy area and other important features. Note small side movement of northwest flank of fire between 3:10 p.m. and 5 p.m.

b. Photograph No. 2, provided by Henry J. Thol, taken from near the saddle at the head of Mann Gulch looking down the Gulch toward the river, shows the character of the cover on the right-hand side of Mann Gulch where the tragedy occurred. Note the scattered timber on this side of the draw and the large open areas that were covered with grass previous to the fire. Also note the heavy burned-out pole stand on the left-hand side of the Gulch looking down draw in the direction of the river.

c. Pictures Nos. 3 and 4 are oblique aerial photographs of the disaster area. No. 3 is the view looking southeast across Mann Gulch near the disaster area. Picture No. 4 is the view looking northeast up Mann Gulch.

2. Brief history of training and experience of principals:

- a. R. Wagner Dodge
- b. William J. Hellman
- c. Earl E. Cooley



*This sketch is diagrammatic and not exact as to scale or position -- It's purpose is to convey a general picture of fire's action and certain related events.*

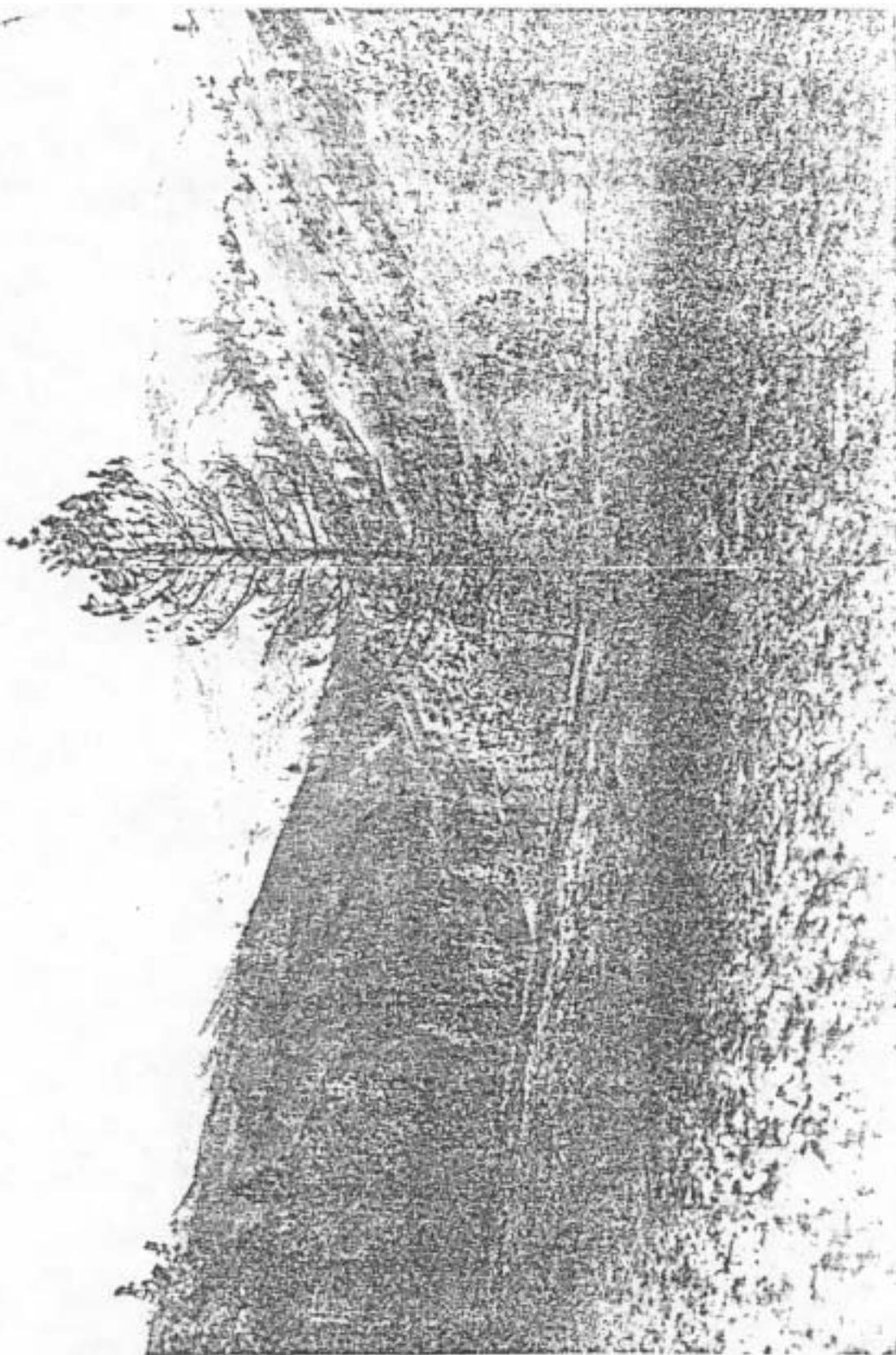


Photo #2

View of Mann Gulch (looking west from head of Gulch)

Photo by Henry Thal

### LEGEND

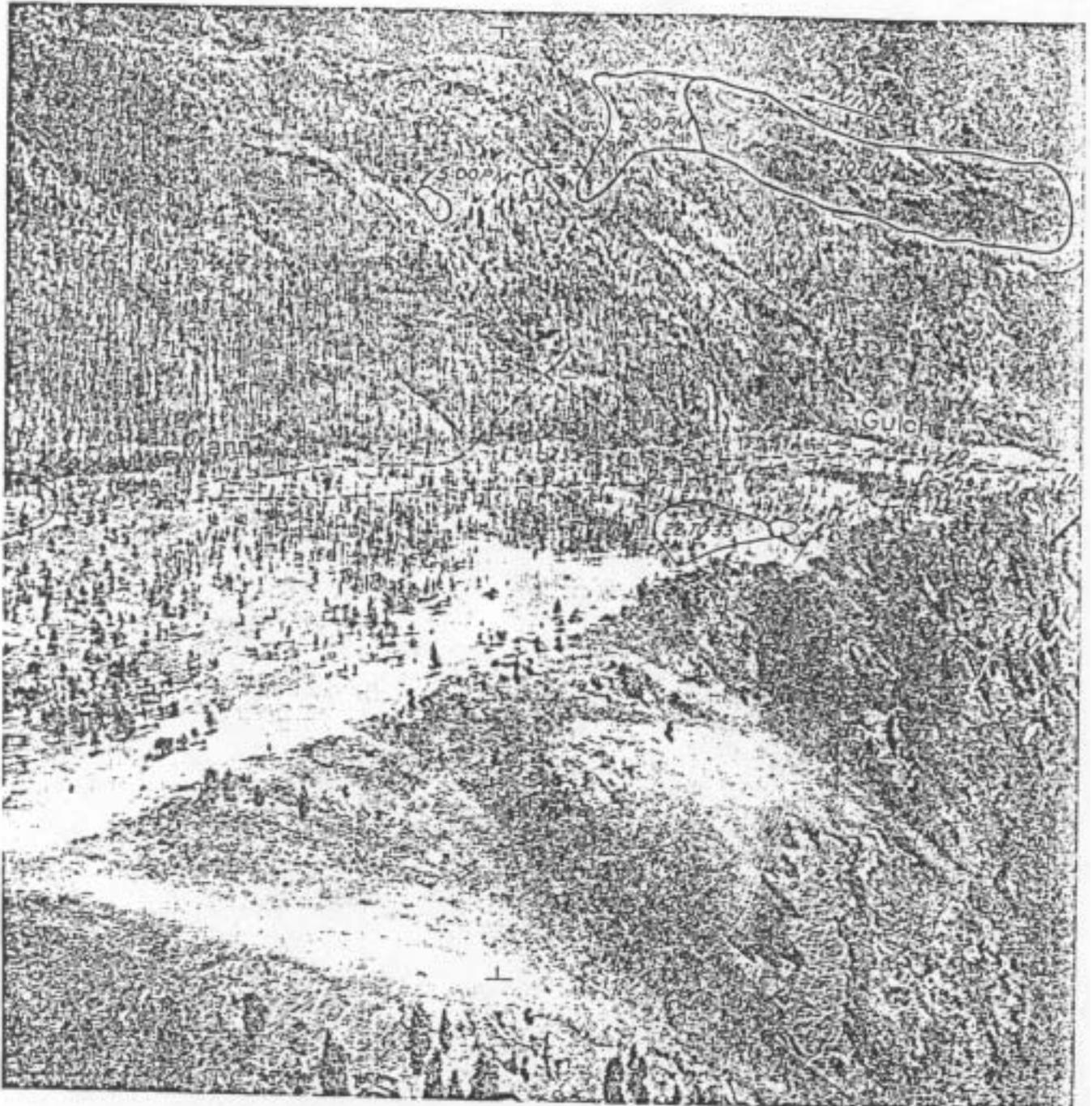
To accompany oblique photographs Nos. 3 and 4, of the Mann Gulch Fire, Helena National Forest, Montana, August 5, 1949. Numbers refer to those shown on the photographs.

1. The area selected by Spotter Earl E. Cooley and Foreman R. Wagner Dodge as the place jumpers and cargo would land.
2. Location where cargo was gathered and stored. Also the point from which Dodge heard someone calling up on the ridge in the vicinity of Point 4. (Picture No. 3 only.)
3. Route traveled by Dodge to point of contact with Ground Patrol James O. Harrison at Point 4.
4. Point of contact between Harrison and Dodge a few minutes after 5 p.m.
5. Point where Dodge and Harrison met William J. Hellman and the crew enroute to the fire.
6. Route Hellman and crew followed on their way down Mann Gulch after meeting Dodge at Point 5. (Picture No. 3 only.)
7. Route Dodge and Harrison followed back to cargo camp at Point 2.
8. Route Dodge and Harrison followed to join crew.
9. Point Dodge and Harrison met crew. Dodge at this point accounted for all men, placed Hellman in the rear while he took the lead; about 5:40 p.m. No fire visible in bottom of Mann Gulch from this point.
10. Route followed by crew. (Picture No. 3 only.)
11. Location from which Dodge determined that there was fire on the north side of Mann Gulch about 750 feet below him and concluded his planned route of travel was cut off (about 5:45 p.m.); all men present.
12. Line of travel after turning back in search of way around fire to river.
13. Point at which tools were discarded by most members of the crew; all men present. (Picture No. 3 only.)

- A. Final area of retreat fire set by Dodge in grass. The main fire at this time was moving towards him and the crew with considerable speed.
20. Where Robert W. Sallee and Walter B. Runsey found safety, and where marker is located. (Picture No. 3 only.)
21. William J. Hellman marker; found alive at this point but died later in the hospital at Helena, Montana. (Picture No. 3 only.)
- 22.-33. Area in which eleven bodies were found after being caught by the sweep of the main fire. One other man was found alive in this area but he died later in the hospital at Helena, Montana. (Picture No. 3 only.)

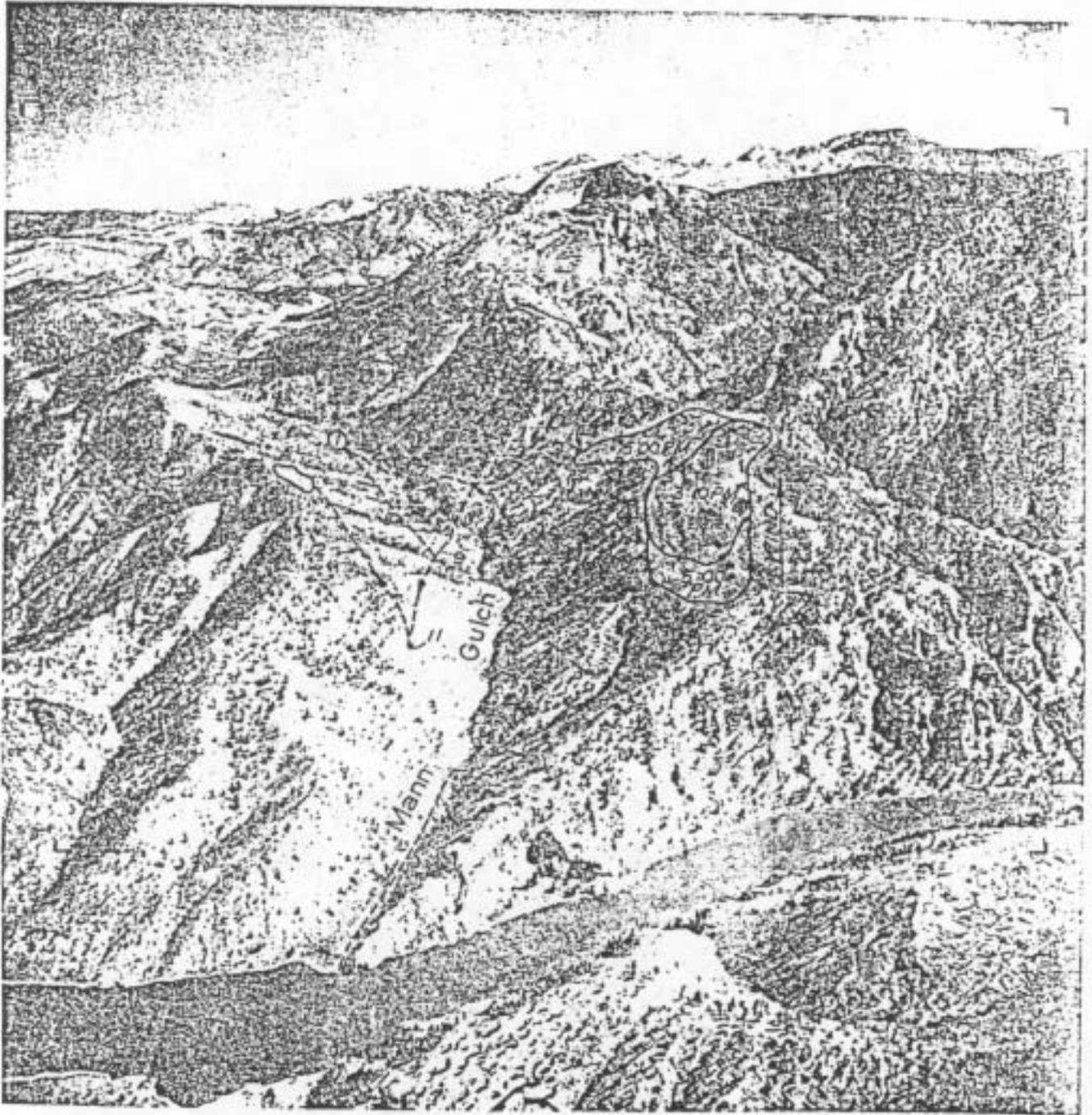
NO. 3

OBLIQUE PHOTOGRAPH  
MANN GULCH FIRE DISASTER AREA  
HELENA NATIONAL FOREST, MONTANA  
AUG. 5, 1949



NO. 4

OBLIQUE PHOTOGRAPH  
MANN GULCH FIRE DISASTER AREA  
HELENA NATIONAL FOREST, MONTANA  
AUG. 5, 1949



Foreman R. Wagner Dodge

Nine seasons' regular Forest Service experience, including 8 seasons with the smokejumper unit, 5 years of which was as smokejumper foreman. During 1945, 1946 and 1947, he was in charge of smokejumper crews of the Forest Service Continental Unit. He received 9 seasons' special training in fire suppression work, also as firefighting foreman, in fire behavior, etc. Also received training in smokejumping, spotting jumpers and as Smokejumper foreman.

Fire suppression records are not complete but they show he worked as firefighter on the West Trout Creek Class E fire (over 300 acres) in 1950; as firefighter on MacPherson Class E (over 300 acres) in 1931; as firefighter on 3 railroad fires in 1932; as firefighter on Berry Mountain fire in 1934; as smokechaser on 2 fires in 1937; as squad leader on one Class A, two Class B, one Class C and one Class D fires (100 to 300 acres) all in 1938; as fireman on four Class A fires and one Class B fire, as foreman on one Class E fire (over 300 acres), all in 1940; as smokejumper on one Class A, one Class C (10 to 100 acres) and as smokejumper in charge of jumpers on one Class B fire in 1941; as squad leader in charge of jumper crew on two Class D fires in 1944, one Class D fire in 1947, and one Class C fire in 1948.

b. Squad Leader William J. Hellman

One season as ranger district employee, four seasons with the smokejumper project; assisted as an instructor during spring training program for smokejumpers. He was given training in fire behavior and also took the foreman's J.I.T. course in 1948.

Fire suppression experience: in 1946, two class A, two Class B, two Class C (10 to 100 acres) and one Class E fires (over 300 acres). In 1947, four Class A, two Class B and one Class C fires. In 1948, two Class C fires.

c. Spotter Earl E. Cooley

Four seasons as forest guard previous to joining smokejumpers. Joined the smokejumper unit in 1940 and was one of the first two men to jump on an actual forest fire. He has been with the smokejumpers from 1940 through the 1949 seasons. Trained as parachute rigger in 1941. Promoted to chief foreman of parachute squads in 1943 and worked on fire training, equipment development, as spotter, fire foreman and sector boss that year. From 1944 to January 1948 was assistant to the project administrative officer and in charge of training for the 150-man smokejumper crew. In January 1948 was promoted to Fire Technician and is responsible for organizing and supervising the training of project personnel in the techniques of fire suppression, use of tools, woodsmanship, safety and first aid. Occasionally is a jumper in charge of large crews of

smokejumpers on difficult and potentially dangerous fires. Also serves as spotter for smokejumper crews where jumping conditions or fire potentials are hazardous.

He has jumped on numerous small, medium and large fires among which was the Kah Mountain fire that required 75 jumpers to control. He has had assignments on a number of large fires such as the Miller Creek fire in 1947, the Pettibone Ridge fire where he had charge of 100 firefighters, the Dearborne fire, the Kah Mountain fire, the Meadow Creek fire and another large fire out of Lander, Wyoming. He has had a great deal of experience in watching fire behavior from the air on fires such as the Eddy Creek fire on the Cabinet, the Washington Creek fire on the Clearwater and the Benchmark fire on the Lewis & Clark, all large fires.