



# the VOLCANO BEAUTIFUL

MT. ST. HELENS—A 1981 APPOINTMENT CALENDAR  
November 1980—December 1981 Educational Text by Dr. Marvin Beeson



# the VOLCANO BEAUTIFUL<sup>®</sup>

## COVER:

July 22, 1980, the volcano blew away a 40-acre lava dome the size of Seattle's King Dome Stadium. It sent steam, rock and ash 45,000 feet into the air. The setting sun adds color to the white vapor clouds as they roll east.

## NOVEMBER 1980

The northwest side of Mount St. Helens prior to the 1980 eruptions. Dark rocks on left are Goat Rocks, lava dome formed during an eruption about 1800.

## DECEMBER 1980

Looking northwest. Initial eruption on March 27, 1980 ejected ash onto the mountain's white, snow-covered slopes. The first ash was composed of finely ground rock fragments and crystals from the old cone. The snow covered lava flows in the foreground were formed during an eruption about 450 years ago. At this same time the cone shaped summit dome was formed.

## JANUARY 1981

Steam and ash are ejected through a cloud that obscures the crater and emphasizes the symmetry of the cone that existed in March. Spirit Lake (seen just above clouds, covered with snow and ice), was created about 4,000 years ago by mudflows and ash from Mount St. Helens that dammed the North Tootle River. The May 18 eruption, in the direction of Mt. Rainier left similar deposits. The same kind of eruption that created Spirit Lake was later to devastate it, and then to rebuild it.

## FEBRUARY 1981

Eruptions between March 27 and May 18 contained varying amounts of steam and ash. The heavier ash tends to fall out of the eruptive cloud as condensed steam rises to form a white cloud. A dark shadow of ash mantles the once pristine, snow-covered slopes downwind.

## MARCH 1981

Helicopter surveys the south wall of the crater before the climactic eruption of May 18. Note the large variation in thickness of glacial ice in the side of a crater formed about 450 years ago. Ice and rock continually form avalanches into the crater. Very little melting of ice took place attesting to the low temperatures of the early eruptions.

## APRIL 1981

Evening light on May 18 illuminates two plumes. The smaller plume originates near Spirit Lake very near the spot where Harry Truman's lodge stood. This plume was from a "rootless" vent (fumerole) created by hot flows of gas and ash from the north side of the crater. Heat from these deposits warmed water below producing steam that erupted with tremendous force, carrying ash high into the air. This type of vent lasted several weeks.

## MAY 1981

May 18, 1980, 8:31 a.m. P.S.T., the largest explosion in the United States took place. Pyroclastic flows of hot ash suspended on super-heated gases race down the slopes instantly destroying everything in their path for miles.

## JUNE 1981

The shape of the mountain was completely changed by the May 18 eruption. About 1,300 feet of the top was blown away from the 9,677 foot volcano.

## JULY 1981

The initial blast knocked down trees up to 16 miles from the summit in a fan-shaped swath north from the eruption. The initial blast was created in part by the huge landslide and in part by the lateral forces of expanding gases when the "pressure cooker" exploded, destroying 150 sq. miles of timber in less than 4 minutes, while 100 foot trees were sand blasted to needle points in some areas. This upwind location, near the southwest margin of the blast area on the ridge received very little ash. Other areas were buried in several feet of ash.

## AUGUST 1981

Tons of mud, hot ash and gases poured over the land. Craters were then formed by steam from the trapped water and created fumeroles in pyroclastic flow deposits near Spirit Lake at the base of Mt. St. Helens.

## SEPTEMBER 1981

Clouds of white steam billowing from a 1 x 2 mile, 3000 foot deep crater at sunset creating a thing of beauty unto itself. Mt. Hood is seen in the background.

## OCTOBER 1981

Lava dome. The first liquid rock to reach the surface non-explosively was the lava which formed this dome. This was not the free-flowing red basalt seen in Hawaii, but a viscous dacite which rose slowly in the vent and cooled at the surface to a crusty white rock. The ridges surrounding the dome are pumice deposits from the three previous explosive eruptions.

## NOVEMBER 1981

The "new look" of a shorter, by 1,300, black Mount St. Helens contrasts with the dormant 14,440 ft. Mt. Rainier to the north.

## DECEMBER 1981

A collage of photos surrounds the glowing fires of the 1/4 mile crater vent. They are:

**Left:** The explosion of May 18 sent steam to 75,000 feet and ash to 63,000 feet.

**Top Row:** Snow-covered Mt. St. Helens, March 23, 1980. The eruption of May 18.

Additional eruptions July 22, 1980.

The bulging peak shortly before it gave way on May 18.

**Second Row:** White plumes of steam dance where a great forest grew days before.

Helicopter searches the barren waste. The open crater of the volcano as of July 24, 1980.

**Middle Row:** (L) Spectacular night shot shows fire in the 1/4 mile wide vent, July 24, 1980.

(R) The 40 acre vent dome in the center of the volcano was blown out in one explosion on July 22, 1980, leaving the fire hole on the left.

**5th Row:** Overall view of the volcano and mud flows.

150 sq. miles of timber was destroyed in four minutes.

Forest land covered with foot deep blanket of ash, as a white column of steam rises from Mt. Saint Helens in the distance.

**Bottom Row:** 20 ft. high wall of water raced down the mountain streams destroying roads, bridges and homes.

Green vegetation grows around heavy ash covered stump as nature starts to rebuild again.

# THE 1980 ERUPTION OF MOUNT ST. HELENS: A SUMMARY

by Marvin H. Beeson, Ph.D.

## Man and the Mountain

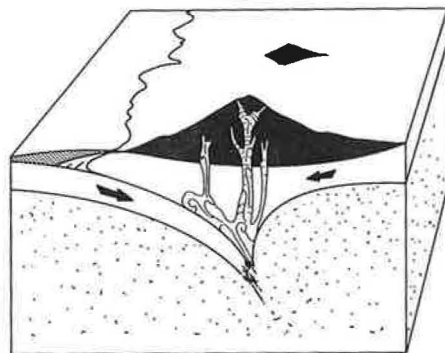
Mount St. Helens is in southwestern Washington State, 45 miles northeast of Portland, Oregon. It was a beautiful, symmetrical and serene peak. The mountain dramatically changed in the public mind when, with a small eruption on March 27, 1980, the world saw proof that it was an active volcano. Millions of people followed its progress from this small initial eruption to the violent and climactic explosion of May 18, 1980. This was the first eruption of ash from Mount St. Helens in 123 years, the first eruption of a volcano in the contiguous United States since Mt. Lassen erupted in 1914-15 and the first such eruption to be thoroughly covered by the media and brought live into millions of homes through television—the most exciting natural phenomenon of the century.



There were many participants in this event, as well as spectators. One such was the colorful and crusty 83 year old Harry Truman, owner of the Mount St. Helens Lodge at Spirit Lake. Harry had lived there at the base of the mountain's north slope for over half a century and loved and trusted his mountain. Although he was concerned and excited about the eruptions and earthquakes, he refused to leave his lodge. Harry would point his finger at the mountain and say, "There is no way that mountain is going to get me here at Spirit Lake." Harry Truman is now among the 65 people listed as dead or missing in the catastrophic May 18th eruption. Thousands more who lived near the volcano were affected by mudflows and floods and millions were affected by ash that drifted across the entire continent.

## Science and Mount St. Helens

Mount St. Helens is one of many volcanoes in the Cascade Range of Washington, Oregon and California that includes Mt. Baker, Mt. Rainier, Mt. Hood, Mt. Jefferson, Mt. Shasta and Lassen Peak. The Cascade Range is a segment of the "ring of fire" that circles the Pacific Ocean with volcanoes and frequent earthquakes. Geologists have recently concluded that this belt results from rigid plates of the outer shell of the earth colliding along this zone. The oceanic plate is thinner and denser than the continental plate and dives beneath the continental margin where it is heated and partly melted to produce liquid rock called magma, the source for all volcanoes (see figure top next column). The energy source within the earth that moves the plates



and heats the rock is decay of naturally occurring radioactive isotopes of potassium, uranium and thorium. The magma is produced in a zone just below the 60 mile thick plates and rises to the surface due to its lower density. Eruption at the surface from a single vent produces a volcano, such as Mount St. Helens.

The mid-Atlantic Ridge, including Iceland, the Azores and Surtsey, is made of volcanic rock erupted where plates move apart, creating new oceanic crust. The Hawaiian Islands are produced where a plate moves slowly over a magma-generating "hot spot" in the mantle that lies beneath the earth's crust. Volcanoes formed in these different structural settings are different in their shape, explosiveness and rock types.

Common volcanic rocks include basalt, andesite, dacite and rhyolite. Basalt, as in Hawaiian volcanoes, flows most easily and tends to erupt least explosively whereas rhyolite flows slowly and may erupt violently. Volcanoes such as Mount St. Helens, formed in belts where earth plates converge, have the potential to be most explosive.

Mount St. Helens has been the most active volcano in the contiguous United States in the past 4,500 years, coming to life approximately every 100 years. It has a long history of explosive activity going back 38,000 years. Most of the visible cone of this mountain was formed in the last 2,500 years. The classical cone shape was formed as successive eruptions distributed lava and ash around the single vent, or conduit.

## A Chronology of the 1980 Eruptions

### I. Pre-eruptive Stage: March 20-March 26

A magnitude 4.1 earthquake on March 20 signaled the awakening of Mount St. Helens as magma began pushing its way toward the surface. At first only a few small quakes per day were recorded until March 25 and 26 when about 130 quakes per day of magnitude greater than 3.0 shook the mountain.

### II. Non-magmatic Eruptive Stage: March 27-May 17

This stage was characterized by eruptions of steam and

ash. The intruding magma was acting as a heat source that changed ground-water of the mountain to steam that rose explosively to the surface grinding rocks within the conduit to a fine ash that was expelled in the eruptions. No new solid magmatic material was erupted, however some magmatic gases, such as sulfur dioxide, escaped from the vent. The first eruption took place on March 27 creating a small crater. Subsequent eruptions enlarged the crater until it was bigger than four football fields and over 800 feet deep. Ice and rock constantly caved off into the crater to be ground up and ejected in the next eruption. The maximum height of the steam and ash plumes was about 10,000 feet above the crater during this stage. A bulge that finally expanded northward to a total of about 500 feet formed on the north side of the cone above Spirit Lake. In early May its rate of growth was measured at five feet a day. The frequency of earthquakes decreased slowly until May 18.

### III. Explosive Magmatic Eruptive Stage: May 18-July 24

Since May 18, four major eruptions have occurred in which new solid magmatic material was produced. First was the catastrophic eruption of May 18 in which ash was carried to an altitude of 63,000 feet. Smaller eruptions occurred on May 25, June 12 and July 22. The May 18th eruption was initiated by a magnitude 5.1 earthquake that caused the entire bulging north flank of the cone to slide. This released pressure on superheated water in the cone and on the underlying magma gave rise to a gigantic eruption. First the super-heated water of the volcano flashed into steam, carrying with it huge amounts of rock and ash from the old cone. This was followed by the escape of gases from within the magma which blew the liquid rock into fine pieces. Nearly one cubic mile was blown off the top of the mountain during this one eruption. The huge new crater now measured about one mile wide by two miles long and over 3,000 feet deep. The 9,677 foot mountain was 1,300 feet shorter. Following the June 12th eruption a lava dome began to form at the top of the conduit in the crater. Magma rising from below hardened into rock when it reached the surface and cooled, and the dome increased in size as additional magma rose underneath it. During late June and early July there was little notable earthquake activity. Finally, pent up gases beneath the lava dome exploded on July 22 with three eruptions in rapid succession, leaving a hole where the dome had been.

## The Future

No one knows what the volcano will do next, or when, or if it will do anything more at all. Volcanology is at best an inexact science so all geologists can do is say what may happen and help everyone to be prepared.

So we watch...and wait...and wonder...awed by the opportunity to observe and study the Earth in its natural process of change. Mount St. Helens—our window to one way our world evolves.





Mount St. Helens in evening light—1979.



1980

NOVEMBER

1980

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p><b>OCTOBER</b></p> <p>S M T W T F S</p> <p>1 2 3 4</p> <p>5 6 7 8 9 10 11</p> <p>12 13 14 15 16 17 18</p> <p>19 20 21 22 23 24 25</p> <p>26 27 28 29 30 31</p>	<p><b>DECEMBER</b></p> <p>S M T W T F S</p> <p>1 2 3 4 5 6</p> <p>7 8 9 10 11 12 13</p> <p>14 15 16 17 18 19 20</p> <p>21 22 23 24 25 26 27</p> <p>28 29 30 31</p>					<p><b>1</b></p> <p>All Saints Day</p>
<b>2</b>	<b>3</b>	<p><b>4</b></p> <p>Election Day</p>	<b>5</b>	<b>6</b>	<p><b>7</b></p> <p>● NEW MOON</p>	<b>8</b>
<b>9</b>	<b>10</b>	<p><b>11</b></p> <p>Armistice Day</p>	<p><b>12</b></p> <p>Elizabeth Cady Stanton Day</p>	<b>13</b>	<b>14</b>	<p><b>15</b></p> <p>☾ FIRST QUARTER</p>
<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<p><b>22</b></p> <p>○ FULL MOON</p>
<p><del>23</del> 30</p> <p>First Sunday of Advent</p>	<b>24</b>	<b>25</b>	<b>26</b>	<p><b>27</b></p> <p>Thanksgiving</p>	<b>28</b>	<p><b>29</b></p> <p>☾ LAST QUARTER</p>





Dark ash covered spot marks first eruption late March.



# 1980

# DECEMBER

# 1980

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	<b>1</b>	<b>2</b>	<b>3</b> First Day of Hanukkah	<b>4</b>	<b>5</b>	<b>6</b>
<b>7</b> ● NEW MOON	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>
<b>14</b>	<b>15</b> ◐ FIRST QUARTER  Bill of Rights Day	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>21</b> ○ FULL MOON  First Day of Winter	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>  Christmas	<b>26</b>	<b>27</b>
<b>28</b>	<b>29</b> ◑ LAST QUARTER	<b>30</b>	<b>31</b>		<b>NOVEMBER</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	<b>JANUARY</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



Dome-shaped cloud obscures crater during March eruption.



1981

JANUARY

1981

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Purple plume of ash and steam drift southward—late March.



# 1981

# FEBRUARY

# 1981

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Southward into crater in rock and ice—April.



# 1981

# MARCH

# 1981

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<b>1</b>	<b>2</b>	<b>3</b> <small>Shrove Tuesday</small>	<b>4</b> <small>Ash Wednesday</small>	<b>5</b>	<b>6</b> ● <small>NEW MOON</small>	<b>7</b>																																																																														
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Two plumes at Sunset—May 10, 1980.



# 1981

# APRIL

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<b>12</b>  Palm Sunday	<b>13</b>	<b>14</b>	<b>15</b>  Income Tax Day	<b>16</b>	<b>17</b>  Good Friday	<b>18</b>																																																																																																																																																																																																																																																																										
<b>19</b>  FULL MOON  Easter First Day of Passover	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>																																																																																																																																																																																																																																																																										
<b>26</b>  Daylight Savings Time begins	<b>27</b>  LAST QUARTER	<b>28</b>	<b>29</b>	<b>30</b>																																																																																																																																																																																																																																																																												



Climactic eruption of May 18, 1980 viewed from the south.



1981

MAY

1981

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<p>10</p> <p>◐ FIRST QUARTER</p> <p>Mother's Day</p>	<p>11</p>	<p>12</p>	<p>13</p>	<p>14</p>	<p>15</p>	<p>16</p>																																																																																				
<p>17</p>	<p>18</p>	<p>19</p> <p>○ FULL MOON</p>	<p>20</p>	<p>21</p> <p>Victoria Day, Canada</p>	<p>22</p>	<p>23</p>																																																																																				
<p>24 / 31</p>	<p>25</p> <p>Memorial Day</p>	<p>26</p> <p>◑ LAST QUARTER</p>	<p>27</p>	<p>28</p> <p>Ascension Day</p>	<p>29</p>	<p>30</p> <p>Traditional Memorial Day</p>																																																																																				



Mt. Saint Helens crater at sunset.



# 1981

# JUNE

# 1981

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<b>7</b>  Pentecost	<b>8</b>  Shabuoth	<b>9</b> ◐ FIRST QUARTER  Senior Citizens Day	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>																																																																																																
<b>14</b>  Trinity Sunday Flag Day	<b>15</b>	<b>16</b>	<b>17</b> ○ FULL MOON	<b>18</b>	<b>19</b>	<b>20</b>																																																																																																
<b>21</b>  Father's Day First Day of Summer	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b> ◑ LAST QUARTER	<b>26</b>	<b>27</b>																																																																																																
<b>28</b>	<b>29</b>	<b>30</b>			<p style="text-align: center;">MAY</p> <table border="1" style="width: 100%; text-align: center;"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td></td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr> <tr><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td></tr> <tr><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S					1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							<p style="text-align: center;">JULY</p> <table border="1" style="width: 100%; text-align: center;"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td></td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td></td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td></td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S					1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18		19	20	21	22	23	24	25		26	27	28	29	30	31		
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Devastated forest, 7 miles northwest of Mt. St. Helens volcano summit.

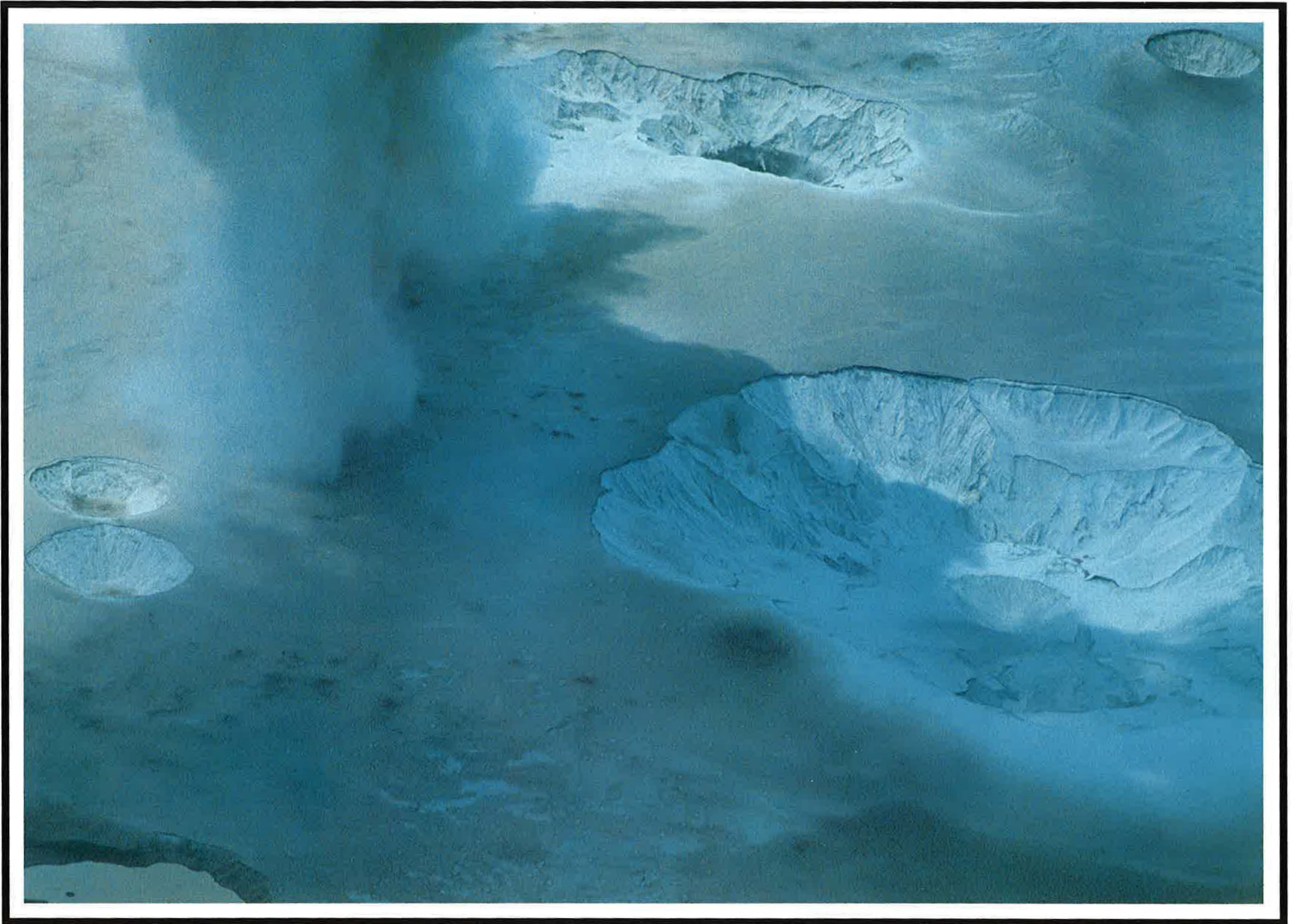


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1981

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Mt. Saint Helens "moonscape"—craters caused by trapped hot gases.



1981

AUGUST

1981

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<p><b>JULY</b></p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td></tr> </table>	S	M	T	W	T	F	S				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		<p><b>SEPTEMBER</b></p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30							<b>1</b>
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Steam billows from the new crater at sunset.



1981

SEPTEMBER

1981

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13	14  FULL MOON	15	16	17 Citizenship Day	18	19																																																																																											
20  LAST QUARTER	21	22 First Day of Autumn	23	24	25 Native American Day	26																																																																																											
27	28  NEW MOON	29 Rosh Hashana	30		<p><b>AUGUST</b></p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td></tr> <tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr> <tr><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td></tr> <tr><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td></tr> <tr><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td></tr> <tr><td>30</td><td>31</td><td></td><td></td><td></td><td></td><td></td></tr> </table>	S	M	T	W	T	F	S							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						<p><b>OCTOBER</b></p> <table border="1"> <tr><td>S</td><td>M</td><td>T</td><td>W</td><td>T</td><td>F</td><td>S</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1 2 3</td></tr> <tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr> <tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td></tr> <tr><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td></tr> </table>	S	M	T	W	T	F	S							1 2 3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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St. Helens lava dome—July 1980.



1981

OCTOBER

1981

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<b>11</b>	<b>12</b>  Columbus Day Canadian Thanksgiving	<b>13</b>  FULL MOON  First Day of Sukhoth	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>																																																																																				
<b>18</b>	<b>19</b>	<b>20</b>  LAST QUARTER	<b>21</b>  Simhath Torah	<b>22</b>	<b>23</b>	<b>24</b>  United Nations Day																																																																																				
<b>25</b>	<b>26</b>	<b>27</b>  NEW MOON	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>  Halloween																																																																																				






Ash-covered snow on Mount St. Helens contrasted with snow-covered Mt. Rainier.



1981

NOVEMBER

1981

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<b>1</b>  All Saints Day	<b>2</b>	<b>3</b>  Election Day	<b>4</b>	<b>5</b>  FIRST QUARTER	<b>6</b>	<b>7</b>
<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>  FULL MOON  Armistice Day	<b>12</b>  Elizabeth Cady Stanton Day	<b>13</b>	<b>14</b>
<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>  LAST QUARTER	<b>19</b>	<b>20</b>	<b>21</b>
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>  NEW MOON  Thanksgiving	<b>27</b>	<b>28</b>
<b>29</b>  First Sunday of Advent	<b>30</b>				<b>OCTOBER</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	<b>DECEMBER</b> S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31





Mount St. Helens 1980—change and the forces of change.







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**Marvin H. Beeson Ph.D.**, our author and technical advisor to Volcanology, Ltd. is Professor of Geology, Earth Sciences Department, Portland State University, Portland, Oregon. Dr. Beeson has also held the position of visiting Assistant Professor of Chemistry, Reed College and Chairman of the Earth Sciences Department at Portland State. He received his education at the University of Oregon, University of Missouri, University of California, San Diego, and Eastern Oregon College, receiving his Ph.D. in Geochemistry (Dissertation: "Trace Element Study of Silicic Volcanic Rocks") in 1969. He has studied volcanism in many areas of the world specializing in the study of volcanic structures and geothermal resource assessment of the Cascade Range. His many studies have been reported in many of the geologic communities' journals as well as the American

Journal of Science. Dr. Beeson is a member of the Geochemical Society, The Oregon Academy of Science, The Geological Society of the Oregon Country and the Society of Miscellaneous Oregon Geologists.

We are grateful for Dr. Beeson's help in the text preparation and also the use of some of his photography; since early March 1980 he has risked his life several times landing in or on and flying near the crater of Mt. St. Helens.

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Al Hayward  
Cover, December 1980, January 1981, March 1981, May 1981, June 1981, August 1981, September 1981, October 1981, November 1981 and December 1981.

Marvin Beeson  
July 1981, December 1981

Ron Cronin  
February, 1981

Roger Werth  
December 1981

Pat and Tom Leeson  
December 1981

John Hill  
November 1980

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