

Badwater

Ultra Marathon

25th Anniversary '77-'02



 **Sun Precautions**

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adventure
CORPS™
"We're Out There"

549 Vistamont Ct.
Berkeley, CA 94708-1243 USA
Pho 510-528-3263
Fax 419-818-5393

Chris Kostman, Race Director - chris@badwaterultra.com
Official Race Website - <http://www.badwaterultra.com>
Online Store - <http://store.adventurecorps.com>
Race Production Company - <http://www.adventurecorps.com>

Runners on cover
Left: Al Arnold, photo by Eric Rahkonen, 1977
Right: Anne Langstaff, photo by Dave Nelson, 2001

General Information

Date: July 23-25, 2002.

Distance: 135 miles.

Who:

An international field of approximately 80 endurance runners representing approximately ten countries.

Mandatory Runner Check-in:

12:00-2:00PM, Monday, July 22, 2002, Visitors Center Auditorium, Furnace Creek, CA. Every runner must attend at some point during the two hour timeframe. Photo identification is required for all runners.

Pre-Race Meeting:

3:00PM to 5:00PM, Monday, July 22, 2002, Visitor's Center Auditorium, Furnace Creek, CA. Runner and at least one crew must attend for the entire meeting. All crew members should attend.

Media Meeting:

There will be a brief meeting of all journalists after the Pre-Race Meeting in the auditorium.

The Jones Experience

Foot Care Clinic:

First Lady Denise Jones will host a foot care clinic, free of charge, immediately after the conclusion of the Pre-Race Meeting in the Auditorium.

Directions to Furnace Creek:

Here is the most direct route from Los Angeles (or anywhere that passes through Mojave on the way to Death Valley): Reset odometer to zero in Mojave and take Hwy 14 north. At mile 20, veer right onto Randsburg Road. At mile 32.2, stay straight (not right). Go left at the t-intersection junction with Hwy 395 at mile 40.5. At mile 43.6, turn right on Searles Station towards Trona (easy to miss). At mile 50, a

t-intersection, turn left to Trona. At mile 58.4, another t-intersection, turn right on Hwy 178 towards Trona. Pass through Trona, including its Texaco gas and mini mart, at mile 71.0.

At mile 104, you have two options. If it's nighttime or you don't like a little adventure, turn left towards Death Valley via Hwy 190. At mile 117.5, turn right at the t-intersection on Hwy 190 towards Death Valley. You will go over Townes Pass (elev. 4965'), pass through Stove Pipe Wells (gas, mini mart, hotel, and restaurant), then arrive at Furnace Creek at mile 170.

Your second option back at mile 104 is infinitely more fun and interesting, as well as even quieter. It's truly epic and feels like going back in time a few zillion years. So, at mile 104, if it's daylight and you have a working spare tire in your car, stay straight towards "Death Valley via Wildrose" instead of veering left as in option one. You will ascend over Emigrant Pass (elev 5318'). But first you'll go over three very short gravel stretches. They are only a few tenths of mile each and are easily passable in a normal car, unless there's a storm dumping on you. Be sure to check out the neat little oasis-like canyon you'll pass through. At mile 113.5, go left at the t-intersection towards Stove Pipe Wells and Furnace Creek. At mile 121 you'll summit Emigrant Pass. At mile 134.3, turn right at the t-intersection with Hwy 190 towards Furnace Creek. You'll pass through Stove



Badwater in the morning

PHOTO: TONY DIZINNO

Pipe Wells at mile 143.5 on your way to Furnace Creek, which you'll reach at mile 168. Voila!

Starting Location:

Badwater, Death Valley, CA, 282 feet below sea level.

Starting Time:

6:00AM, 8:00AM, and 10:00AM, Tuesday, July 23, 2002. Up to 30 runners per group. Runners may attend only their assigned start time. Runners must check in at Badwater, ready to race, 30 minutes prior to their start.

Ending Location:

The end of Whitney Portals Road, above Lone Pine, CA, on Mt. Whitney, elevation 8360 feet. The race does not continue up the Whitney Trail further onto the mountain.

Ending Time:

The event is officially over 60 hours after each starting group, so either 6:00PM, 8:00PM, or 10:00PM, Thursday, July 25, 2002.

Course Records:

Men's: Anatoli Kruglikov, 2000, Russia, 25:09:05.

Women's: Irina Reutovich, 2000, Russia, 29:48:27.

Race Identification:

Each entrant is assigned a race number and a bracelet for identification purposes. The race number and the race bracelet must be worn unmodified and visible at all times during the race. Racer numbers are listed in the back of this book. The actual race number and race bracelet to be worn will be issued to the runner only during the Pre-Race Meeting. Photo identification is required for all runners.

Post-Race Get Together:

6:00PM, Thursday, July 25, 2002, Lo-Inyo Elementary School, Multi-Purpose Room, Lone Pine, CA. All racers are encouraged to complete the race in time for this event! Pizza and drinks will be served at this informal get-together. There will be an open mic for runners to thank their crews and tell stories.

Post-Race Breakfast:

8:00AM to 10:00AM, Friday, July 26, 2002, Seasons Restaurant, 206 South Main Street, Lone Pine, CA. This will be an informal get-together, planned to provide one last opportunity for Badwater runners and crew to get together and share stories. Juice, coffee, muffins, yogurt, and the like will be provided. Room for 75 people total! First come, first served.

Awards:

All racers who begin the event will receive a Badwater Ultramarathon race t-shirt and Badwater Ultra-marathon Race Magazine. All racers who officially complete the event within 60 hours will receive a commemorative certificate and a finisher's medal. All racers who officially complete the course within 48 hours will also receive a commemorative Badwater Ultramarathon buckle (Buckles and certificates are sent in the mail after the race).

Race Headquarters:

This will be set up in a hotel room in Furnace Creek, then in Lone Pine. Time Station splits will be collated here and updates posted to the race website on a continual basis.

Webcast:

Spread the word that we will post time splits, commentary, and images on a continual basis for the duration of the 60 hour race at <http://www.badwaterultra.com>.

Rental Car Special Rates:

Participants in AdventureCORPS events can receive special discount rates on cars and vans from Enterprise Rent-a-Car. Call 800-325-8007, 800-593-0505, or any local branch and mention account # 32C1631.

Race Hotels:

We have reserved blocks of rooms in Furnace Creek, Stovepipe Wells, and Lone Pine during our event. Use the information provided here to make your reservations and to secure the special rates that we have obtained for Badwater Ultramarathon racers, crew, and staff. *Do not delay in making your reservations;* the Death Valley area is a very popular place during the Summer.

Furnace Creek Inn and Ranch Resort

Mile 17 on race route.

Phone: 760-786-2345

Fax: 760-786-2307

Booking Number: 4900

Password: Badwater Ultra

Rates: \$102/night for one or two occupants; \$20 per room extra for each additional occupant; \$20 for a rollaway bed; plus 9% tax and a \$2.50 energy surcharge. Reservations must be made by phone or fax.

Stovepipe Wells Village

Mile 42 on race route.

Phone: 760-786-2387

Fax: 760-786-2389

Password: Badwater Ultra

Rates: \$67/Standard: two beds; \$88/Deluxe - larger room with TV and fridge - with one or two beds; plus 9% tax. Reservations must be made by phone or fax.

Panamint Springs Resort

Mile 72 on race route.

Jerry Graham, owner

Phone: 775-482-7680

Fax: 775-482-7682

Website: <http://www.deathvalley.com>

Race Hotels in Lone Pine

Mile 122 on race route.

Dow Villa

Yolanda Chavez, Manager

310 South Main Street

Lone Pine, California, 93545

Toll Free: 800-824-9317

Phone: 760-876-5521

Fax: 760-876-5643

email: dowvilla@qnet.com

Best Western Frontier Motel, Inc.

Jerre Noland, Guest Services Supervisor

1008 South Main Street

Lone Pine, California, 93545

Toll Free (CA): 800-231-4071

Fax: 760-876-5571

Alabama Hills Inn

1920 South Main Street

Lone Pine, California, 93545

Toll Free: 800-800-6468

Phone: 760-876-8700

Fax: 760-876-8704

Mt. Whitney Motel

305 North Main Street

Lone Pine, California, 93545

Toll Free: 800-845-2362

Lone Pine Budget Motel

138 West Willow

Lone Pine, California, 93545

Phone: 760-876-5655

Fax: 760-876-5738

Trails Motel

633 South Main Street, PO Box 65

Lone Pine, California, 93545

Toll Free: 800-862-7020

Portal Motel

425 South Main Street

Lone Pine, California, 93545

Toll Free: 800-531-7054

Phone: 760-876-5930

Fax: 760-876-5517

BADWATER TURNS 25

Through the years with the world's longest, hottest, toughest, baaddest endurance race

To understand the history and culture of the Badwater Ultramarathon, the 135-mile foot race from the depths of Death Valley to the flanks of Mt. Whitney, you must be clear about one thing: This is not the Ironman of ultrarunning. This is not merely an extra-long, extra-hard run. This is not the annual focus of all the world's greatest ultrarunners. In fact, most top ultrarunners don't do this race -- or even regard it as running at all.

"It's more of a hike, a 130-degree-in-a-sandstorm hike, a torture-fest that I don't want to repeat," says the great Ann Trason, a 12-time winner of the Western States 100 who did Badwater once -- as a crew member. "I like adventure, but this is an out-of-this-world experience. I drank more crewing Badwater than I did running Western States. I felt like I was in Star Trek -- and I wanted to be beamed out."

In a nutshell, Badwater's a different planet. On this unique world, rubber soles melt, air-sole heel cushions explode, gel oozes out of shoes. Sweat dries before it wets your skin. Cans of soup are already warm when you open them. Hotel air conditioning lowers temperatures to 90. Outside, it feels like you've got a hair dryer in your face, or you're in an oven. To put it mildly, Badwater's not for everybody. In fact, it's safe to say that it's only for people who, like Badwater itself, are kind of, well, out there.

Consider Al Arnold, the man who started it all.

"I've always been the type who thought, 'If the world's going one way, then I'm going the other,'" says Arnold, now 75 and living in Walnut Creek, CA.

Arnold was always trying something just to prove it could be done. At age 21, he was a muscle-bound 6-foot-5 brute who, just for fun, would lift up the rear ends of small cars. He tried out for the 1948 U.S. Olympic boxing team as a light-heavyweight. During a U.C. Berkeley science project, he and a friend rode a teeter-totter for 72 hours straight, setting a world record of 45,159 up-and-downs. After taking 12 years to graduate with a business degree, he worked as a technician building ocean wave force-measuring devices, married twice, enjoyed the good life, and morphed "from jock to fat slob" (his words) as he ballooned to 275 lbs.

Then, at age 39, Arnold got some life-changing news: He had glaucoma.

He could no longer see well enough to hit a tennis ball. He was told by a doctor that "I'd soon have a tag on my toe." But he didn't really get motivated to change his life until he got word of the upcoming 1968 US-World Masters Invitational Track & Field Championship. Soon, just to prove it could be done, Arnold was running stadium steps with 100 lbs. of weights strapped to his body. In 18 months, he'd dropped to a solid 225 lbs. At the masters championships, he won the half-mile, and ran the quarter mile in 69 seconds. Before long, Arnold was working as an athletic director at a health club. Before most people had heard of the term, he was an ultrarunner.

In 1973, Arnold heard about Paxton Beale and Ken Crutchlow, who did a 150-mile relay run from Badwater, the lowest point in the Western Hemisphere at 280 feet below sea level, all the way to the top of 14,496-ft. Mt. Whitney, the highest point in the contiguous United States. Crutchlow, an Englishman from Santa Rosa, CA who imported London cabs for a living, did a lot of crazy stuff in his time -- including riding a bike from San Francisco to Alaska on a bet. Scanning a map of California,

he'd noticed how close the "lowest" and "highest" points were. According to one report, he considered it "outrageous" to think that any man could complete that trek alone.

Arnold was electrified when he heard about the tag-team's achievement. Death Valley fascinated him. Growing up in the 1940s, his favorite radio show was "Death Valley Days." He'd imagined old prospectors, battles with Indians, noble pioneers struggling for existence.

"Immediately, I knew that I had to do that run, too," says Arnold. "But I wasn't about to leap-frog." He did plan to run with a partner -- his dentist David Gabor, a former Hungarian freedom fighter-- but both would complete the entire route.

In 1974, the pair pushed off at Badwater. Several hours later, the mercury topped out at over 130 degrees.

They lasted 18 miles -- until Gabor went into shock. "My buddy almost died," said Arnold. "His whole body shut down. Blood flow to the arms and legs stopped. We had put him into an ice-filled bathtub at the Furnace Creek Ranch. Took him months to recover."

From that point on, Arnold knew he had to go it alone. "When you do something like this, as far-out as Badwater, your mind has to be focused. You can't feel responsible for someone."

So a year later, the 47-year-old Arnold was back. Unfortunately, his knee was not cooperative. Its grotesque swelling stopped his second attempt at mile 36, just before beginning the ascent of 4956-ft.-high Townes Pass.

But 1977 would be different. For two years, Arnold trained like a man possessed. He pedaled a bike in a 200-degree sauna for two hours a day. Carrying no

water and living off the land, he ran 200 to 250 miles a week up and down 4,000-ft. Mt. Diablo, a Bay Area landmark near his home. He once jogged 36 hours straight. "I became so much a part of the land that I could walk through a pack of deer without them moving," he says. "Once, I shared a water hole and its surrounding shade with the 'Resident Mountain Lion.' I never saw it again. It was one of those moments that you never forget."

On August 3, 1977, Death Valley recorded its highest known temperature that year: 124 degrees. While the nearly 50-year-old Al Arnold jogged and power-walked, the super-heated road surface radiated nearly 200 degrees. He left Badwater before dawn, along with a two-man support crew, photographer Erik Rakonen and friend Glenn Phillips, and 30 gallons of a self-concocted electrolyte solution of fructose and water. He drank it all.

Arnold covered the first 40 miles in 10 hours, developed knee trouble on the 15-mile climb over the Panamints, stopped to stretch for a couple hours, then kept going, very slowly. "At least I'd learned one thing over the years: Go fast and you die," he says. Amazingly, Arnold ran an extra 45 miles over the second half of the route. Concerned over the disappearance of his support vehicle, he actually ran back 22 miles to find Rakonen, now crewing alone, asleep and "dead to the world" in the car. A purist, he refused a ride 22 miles back up the course and instead just resumed running towards Whitney.

Searing winds blasted Arnold with sand and silt on the climb over the Inyo Mountains, but it didn't matter. In his mind he had become Olympic decathlon champion Bruce Jenner, immortalized on a box of Wheaties. As he descended into the Owens Valley, he gazed at Mt. Whitney for the first time. The sight so moved him that he stopped and spoke directly to the mountain.

"You probably thought you'd never see me, but soon I'm going to be on top of you," Arnold warned the peak, according to a profile in the 1978 issue of *Marathoner* magazine. "She's a very powerful lady," he explained, "and I didn't want to conquer her --- just be part of a relationship."

Approaching the little town of Lone Pine, the last stop before the final climb, people started coming out onto Highway 136 to take pictures of the "crazy man who had just run from Death Valley." A Highway Patrolman handed him a hamburger and chips. He ate only the bun and headed uphill into the Sierra Foothills, dodging two wild donkeys on the way to the Mt. Whitney Portal at 8400 ft.

The pavement ended and the 11-mile climb up the Mt. Whitney trail began. "As I got closer and closer to the top, the hikers, forewarned of my arrival, all cheered for me," says Arnold. "It was like a ticker-tape parade."

About 192 miles after he'd began his quest, Arnold reached 14,496 feet -- the Mt. Whitney summit. He burst into tears and couldn't stop. He'd lost 17 lbs. -- 8 % of his body weight. He'd been on the road for 84 hours.

Yet there was no time to spare. As dusk fell, Arnold staggered down to the Trail Camp campsite at 12,000 ft. A tent, sleeping bag and warm clothing were to have been stored for him there. Instead, there was nothing left but a plastic tarp. Everything else had been stolen.

After roasting alive in 130 to 120 degree temperatures for over three days, Arnold spent the fourth night in his running shorts, rolled up in plastic, shivering in 20-degree temperatures.

A couple of days later, Arnold's wife suggested a way to warm her man up: A trip to Maui. It would lead to a test more challenging than his amazing run.

On his tenth day of bodysurfing, a 25-ft. wave torpedoed Arnold into the sand, dislocating the cervical area of his neck, separating both shoulders and leaving a severe contusion on his spinal cord. Paralyzed below the neck, gulping for air, Arnold went under seven times before washing up on the shore.

Doctors told him he'd never be able to walk again without a walker, but Arnold left it on the sidewalk when the cab drove him to the airport for the flight home. A mere four months later he ran the five-loop Paul Masson Winery Marathon, stopping every five miles to run into the fire station to clean his running shorts. The accident had left him without bladder or bowel control, a condition that wouldn't clear up for nearly 15 years. Nonetheless, he finished in 4:59:59, much to the amusement of those who trailed him.

"I'll never live it down,' my friend Stan Pletz told me," said Arnold, "I was beaten by a paralyzed man."

A year later, he ran 99 miles around Lake Tahoe in 19 hours.

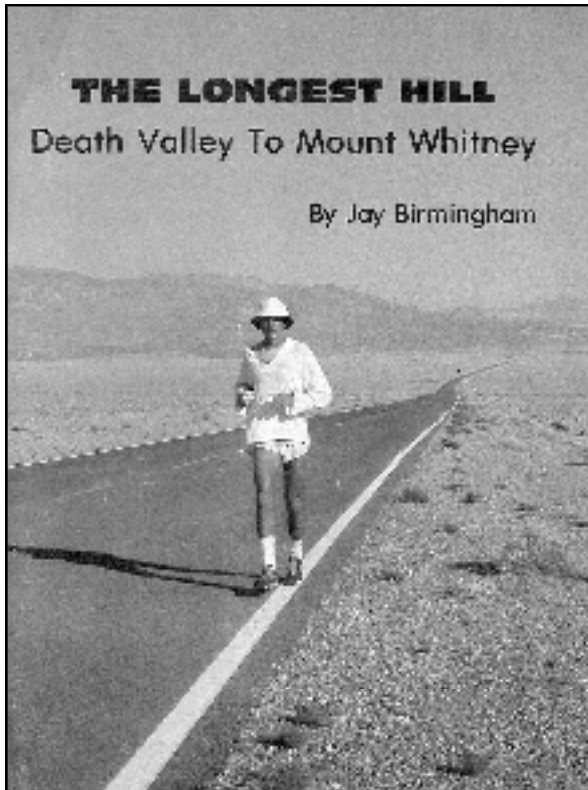
Despite his continued running, Arnold never fully recovered from his paralysis. "My body feels like my foot's been asleep for 25 years," he says.

As for Badwater, Arnold's never considered trying it again. "I did it to prove it could be done -- like Roger Bannister breaking the four-minute mile," he said. "Now, I just sit back amazed at the world-class names who do it now. I'm not in their league."

True. Al Arnold is in a league all his own.

THE RACE IS ON

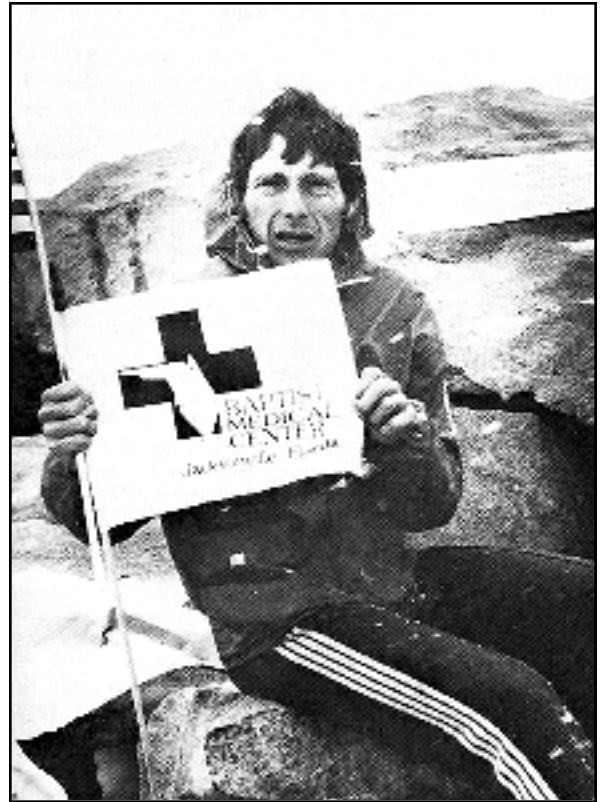
In 1980, 34-year-old Jay Birmingham, a running-store owner from Jacksonville, FL, ran from Los Angeles to New York wearing a small backpack in 71 days, 22 hours, and 59 minutes, the fastest non-supported transcontinental crossing in history. That run, mainly along old U.S. 60, taught him a lot, but especially one thing:



"I was a good hot-weather runner," he said. He'd easily cruised through a heat wave that stretched from Texas to Indiana.

Birmingham had read the article in *Marathoner* magazine about Al Arnold and felt 84 hours would be an easy record to break. He'd also gotten advice from Badwater wannabe Gary Morris, who only got as far as Townes Pass in 1980. So in August of 1981, Birmingham embarked on a family roadtrip through North Carolina, Colorado, Las Vegas, and other places, getting in his training miles along the way.

They eventually arrived in Death Valley and he started running from Badwater at 6 a.m on August 15.



He summited Mt. Whitney 75 hours and 34 minutes later.

Other than "terrible pain in my heel" from Townes Pass to Lone Pine due to a heat-bloated lump in his shoe, the run went smoothly. Birmingham never ran past 10 p.m., slept at least six hours a night, and climbed Whitney with his entire family without any altitude problems. He found the dry heat of Death Valley to be much easier than the draining humidity of his Florida training ground; a week spent in the Rockies just before the run acclimated him to high elevations.

Birmingham's feat didn't gain him national fame, but he did become the first person to publish a book about Badwater in the form of "The Longest Hill," released in 1983. He also put his name in the Guinness Book and set off a slow-building

land rush which saw 30 people complete the lowest-to-highest course in the next decade. In 1982, Max Telford of New Zealand blitzed the blistering course in just 56:33. American Gill Cornell, starting at night, ran a 45:15 in 1987. The very next day, Badwater godfather Ken Crutchlow returned with two Americans and a Brit to stage the first actual head-to-head race on the course, U.S. versus U.K.

As the buzz about Badwater began to grow, the course got the attention of the Hi-Tec shoe company. Seeing the race as a good promotional vehicle for its new running shoe, appropriately named the "Badwater 146," it began sponsoring and producing the event in 1988. It stuck to the long-established "Gentlemen's Rule" that Badwater must be held in the two-month July-August window, when the temperature is hottest.

"Nothing else I've done since compares to Badwater," says David Pompel, who directed the race for three years while working at Hi-Tec and is now a manager at Timberland.

"To go from lowest to highest ... to be at 119 degrees at 6 p.m. ... to see the gel melting out of an Asics Gel shoe ... to have an elevation gain of 24,000 feet ... it looked like something out of Mad Max: Beyond Thunderdome," he said. "Remember, there was no Eco-Challenge then. Most people looked at us like we'd lost our mind."

One of Pompel's most memorable moments came that first year, when he watched Adrian Crane -- later to gain fame for bagging all 50 of the highest points in each U.S. state in one year -- set off across the Death Valley salt flats with modified cross-country skis. "He made the rest of the runners seem normal."

In 1988, eight racers completed in the first Hi-Tec-sponsored race; four finished. American Tom Possert won in 45:10, a figure in dispute because he was photographed being dragged uphill by his support crew. In 1989, seven finished and the race scored its biggest media coup: Five minutes on "The Today Show" with Bryant Gumbel.

One big change in 1989 was moving to a 6:00 p.m. start time, to avoid the hottest part of the day in Death Valley. This rankled the purists, who wanted maximum heat exposure in Death Valley, and was eventually switched back to an AM start with the 1996 race and those held since.

In 1990, the Forest Service forced the race to conclude at the Whitney Portal, creating the 135-mile distance that has been the official route to this day. Over the years, many runners continued onto the mountain unofficially after securing permits. That year, Possert set a new record to the Portal of 27:56. That time shrank quickly over the following decade -- to Marshall Ulrich's still current PM start record of 26:18 in 1992, then a slew of AM start records such as Gabriel Flores' 28:09 in 1998, Eric Clifton's 27:09 in 1999, and the current AM, and overall, start record of 25:09:05, set in 2000 by Russian superhero Anatoli Kruglikov.

Angelika Castaneda and her twin sister Barbara Alvarez were the only women to finish Badwater in 1989 and 1990, but by 1991 were being challenged by the likes of Bonnie Boyer, who set the women's PM start record that year with 36:19. The field grew to seven women by 1999, when all female participants proudly finished. A record seventeen women are registered to compete in 2002.

The current course record was set in 2000 by Irina Reutovich, 51, of Russia, with a time of 29:48:27. This was seven hours faster than Castaneda's 1999 record of

36:58, which was, in turn, three minutes faster than Lisa Smith's 1997 record of 37:01.



Lisa Smith climbing Townes Pass - 2000

Smith, a massage therapist and running/triathlon coach from Victor, ID who will be competing for her 6th time this summer, exhibits the typical ultra career path: Tiring of triathlon after seven Ironmans, she heard about Badwater from Ulrich at the 1995 Eco-Challenge. When she lined up in 1995, the longest run she'd ever done was four hours. Luckily, she loves the heat. She finished in 41:24. After winning three times, she married cameraman Jay Batchen in 2000, and naturally persuaded her husband to run with her. They set a couple's record of 43:23:56 in 2000.

THE SUPERMEN

One night in early 1989, Richard Benyo, a marathoner, author, San Francisco Chronicle columnist, and former Runner's World managing editor, was getting drunk with Tom Crawford, the fifth person to complete Badwater and a two-time finisher. "Listen, man," Benyo slurred, "since you already had to come 12 miles down from the peak, why the heck didn't you just run back all the way to Badwater and finish it?"

And Badwater was suddenly taken to a new level: The Double. Round-trip. Back-to-back.

For three months beforehand, Benyo and Crawford ran in a dry sauna for up to an hour a day. They doubled their bodies' water processing ability from two quarts to one gallon per hour. They camped out for a week in Panamint Springs before the event, running in the heat for four or five hours a day to teach their bodies to conserve water and salt.

"Untrained people lose more salt than trained people," he explains. "So we developed a ritual: Licking each others' arms. After the third day, they wouldn't taste so salty anymore."

During the run, everything went smoothly until the descent from the Mt. Whitney summit, when hail and lightning storms rained terror on the duo. Benyo, slowed by destroyed toes and quads, hobbled back to Badwater in 170 hours and 58 minutes, two days after Crawford, who doubled in 126:34. Every inch of the agonizing way is detailed in Benyo's acclaimed book, "The Death Valley 300."

Two months after the double, Benyo and Crawford began planning another. Benyo doubled again in 1992 in 157:58, Over the next four years, six others doubled, including Benyo's wife, Rhonda Provost, who became the first woman to do a double with her 1995 time of 143:45. In 1996, Milan Milanovich of Switzerland set the double record of 110:26. In 1994, American Scott Weber did a triple: Whitney to Badwater to Whitney to Badwater, in 257:32.

The need to push the boundaries of human endurance even further fell to Marshall Ulrich, a long-time marathoner and ultrarunner from Ft. Morgan, CO who wholesales boneless frozen beef to dog food manufacturers. In 1990, he was looking for a new challenge. Naturally, that led to Badwater.

Having never driven the course, Ulrich figured the course would cool off once it left the Death Valley floor. "I had no idea," he said. After leading the race for 117 miles, Ulrich was passed by 1988 winner Possert.

Vowing to return and win, Ulrich set a new PM start record of 26:32 in 1991 and lowered that to 26:18 in '92.

At this writing, Ulrich has done the Badwater race nine times, won it four times, never stopped at the Portal, and still holds the unofficial record of 33 hours to the Whitney summit.

But all that was just a warmup for a feat that astounded the ultrarunning world. On July 3, 1999, just ten days before the race, Ulrich became the first person to complete the Badwater course unassisted.

Pulling a specially designed, two-wheeled, solar panel-equipped cart that initially weighed 212 pounds and held 21.5 gallons, he reached the Portal, then continued with a backpack to the top of Mount Whitney. The total time: 77 hours and 48 minutes. "It's the hardest thing I've ever done," he told the Ft. Morgan Times. "I don't know how many times I thought of quitting. I was reduced to a desert animal, crawling under mesquite bushes to get away from the heat."

As if that wasn't enough, in 2001 Ulrich commemorated his 50th birthday with something else that had never been done before:

A Quad. A double up-and-back. 584 miles with 48,000 feet of elevation gain.

Starting on July 20, 2001 at 6:10 a.m., Ulrich ran continuously for the first four days, stopping only for short naps totaling 1.5 hours per day. He broke the old double record by almost nine hours, finishing in 96:07, attended the pre-race meeting, went

to sleep, then woke up in time to start the official Badwater Ultramarathon with 70 other contestants the next morning.

Wracked by severe tendonitis on his shins, Ulrich's crew had to ice and wrap his legs every 20 to 30 minutes during the third and fourth crossings. He summited Whitney for a second time with the clock ticking at 185 hours, setting a new triple-crossing record. Nearly wearing through his second pair of shoes, which had to be cut on the sides to relieve several painful, huge blisters, Ulrich hobbled into Badwater at 253 hours (10 days and 13 hours).

The effort paid off. Ulrich, growing increasingly spiritual over the years, managed to raise \$65,000 for Teachers Fillipinni, a Rome-based order of nuns dedicated to helping starving children. On April 17, 2002 he and Lisa Smith, his Quad crewchief, had an audience with the Pope at the Vatican.

But that's not all for Ulrich. In 2002, both he and 67-year-old Englishman Jack Denness, a retired Lloyd's of London driver, hope to become the first people to complete 10 Badwater races. This milestone would also be Ulrich's 100th ultra, with an average distance per outing of 110 miles. From there, he plans to make what he calls "a logical progression:" combining hot weather ultrarunning with snowbound mountain climbing. This June 1, if everything went as planned, he successfully scaled Mt. McKinley. Then in 2003, he'll take it to the extreme: The Everest Summit to Sea -- the longest, fastest descent ever from the world's highest place, Mt. Everest, to Calcutta and the Indian Ocean, 600 miles away.

Through it all, though, he won't forget his roots. "When I'm 100, I'll still be doing Badwater," he says.

THE ORGANIZERS

When Hi-Tec employee Matt Frederick took over as Badwater 135 race director in 1996, the participation limit was gradually raised from 25 to 40. The time to "buckle" - to earn the prized Badwater belt buckle that signifies that you finished well under the overall time limit of 60 hours -- was raised from 45 hours to 48. He was also at the helm when Hollywood immortalized the race in the award-winning feature-length documentary "Running on the Sun," directed by Mel Stuart of "Willy Wonka and the Chocolate Factory" fame.

Frederick enjoyed the quirkiness of the event. In a statistical irony that rankles purists, he discovered that walkers have a higher finishing percentage than runners. He found that older runners finish more frequently than younger ones. He laughs when he tells of driving all the way to Beatty, Nevada, cleaning out a little store and driving back with 200 lbs. of ice. Most of all, he remembers the characters: California dentist Dale Sutton, who raced in pajamas from head to toe, kept cool by sewing extra pockets on his pants and filling them with ice; Major Maples, a U.S. Marine who DNF'd every other year, but finally finished with a whole crew of Corpsmen as his support crew in 1997 and 2000; Charlie Liskey, who crawled across the finish line in 1996. His favorites are the three-time finishers he calls his "virtual grandparents," Ben and Denise Jones, known to most as the "Mayor" and "First Lady" of Badwater.

The couple officially received their titles in a special ceremony at Badwater on July 4, 1992 in recognition of their generous support of the event. Ben, the sole doctor in Lone Pine, has provided medical assistance, served as the race's historian (see his many race reports on the website), and, with Denise, hosts annual race-course training clinics on Memorial Day and Fourth of July weekends. They also

are enthusiastic participants. In 1991, then-58-year-old Ben became the only runner to conduct an autopsy in the middle of the race. He arrived at the Portal that year in 49:00, and at the Whitney Summit in 72:58. He completed Badwater again in 1992 and 1993, usually with a support truck carrying plastic palm trees and an ice-filled casket in which to cool off. Denise, known as the "Blister Queen" because of her expertise in dealing with Badwater runners' feet, is also a three-time finisher (1994, 1996, and 1999).

By late 1999, having long since dropped their "Badwater 146" running and hiking shoe lines, Hi-Tec decided to abandon all support of the race.

Into the void stepped Chris Kostman's AdventureCORPS, producers of the annual Furnace Creek 508 bicycle race through Death Valley, and creator of the L.A. Marathon Bike Tour, Earth Journey Triathlon Stage Race, and the relay division of the Race Across America bicycle race. No desk jockey, Kostman is a record-setting ultramarathon cyclist who's done the Race Across America, Triple Ironman, Iditasport, and other endurance events. In 1995, in recognition of the kindred spirit between the Badwater 135 and his own Furnace Creek 508, he created the "Death Valley Cup," to be awarded to the first or fastest athlete to complete both events in the same calendar year. Not surprisingly, Marshall Ulrich completed both in 1996 and became the first recipient. Angelika Castaneda took the first women's cup in 1999.

"When Ben Jones suggested that I should step in to fill the void left by Hi-Tec's pull-out, I saw an opportunity to give a fantastic, yet under-publicized event the energy and organization it deserves," says Kostman. "It wasn't hard to do; Death Valley is one of the world's great ultra athlete meeting grounds and is an incomparable natural sports arena."

The last two years have seen noticeable additions to what is now called the Badwater Ultramarathon: the first official race website, www.badwaterultra.com; an annual webcast during the race (which received 95,000 page views during the 2000 race and 350,000 page views in 2001); and a new title sponsor in the form of Sun Precautions, the Everett, WA-based makers of Solumbra 30+ SPF sun protective clothing, medically accepted sun protection for sun sensitive and sun sensible people. Also, with a history of successful events in Death Valley, Kostman lobbied the Park Service to double the maximum field size.

The result? For the first time, there is instant worldwide access to Badwater information and applications. In the last two years, over a dozen countries have been represented, including Russia, Italy, France, Japan, Brazil, Hong Kong and more. And despite raising runner qualification and selection standards each year, the field has grown from a previous high of 42 runners to 69 in 2000 and over 80 in 2002.

Finally, with the establishment of the Badwater Hall of Fame, Kostman has brought a sense of history to the event. Fittingly, the first person inducted into the Hall this July, moments before the 2002 race begins, will be the man who started it all 25 years ago, Al Arnold.

When told of his upcoming induction, the George Washington of running in 130-degree temperatures, now 75 and unable to run due to a bum knee, was moved to tell a story.

"I just always liked doing things that others might have thought were crazy, and they weren't always grand things like Badwater," says Arnold.

"I once ran around a 10-by-10 wrestling mat for 10 hours. Even now, I hike a lot in a small area in the hills that most people just pass through quickly, all except for one 14-year-old kid.

"He'd seen me there a few times, and finally stopped to ask me, 'Why do you come here?'

"I answered, 'Because it's my cave.'

"The boy then asked me, 'How big is your cave?' I looked at him and said, 'How big is your mind?'

"The boy was silent for a few seconds. Then he said, 'Can I hike with you again?'"

ABOUT THE AUTHOR

Irvine, CA-based freelancer Roy M. Wallack (roywallack@aol.com) writes for many national magazines and has completed the Eco-Challenge, the 1200km Paris-Brest-Paris bike ride, the 400-mile TransAlp Challenge mountain bike race and other endurance events. He vows to do Badwater someday; his wife is pushing stamp collecting.

Breaking Point...And Beyond

Reprinted From *POL*, July/August 1978

Story by Roger Allebone

Photography by Eric Rahkonen

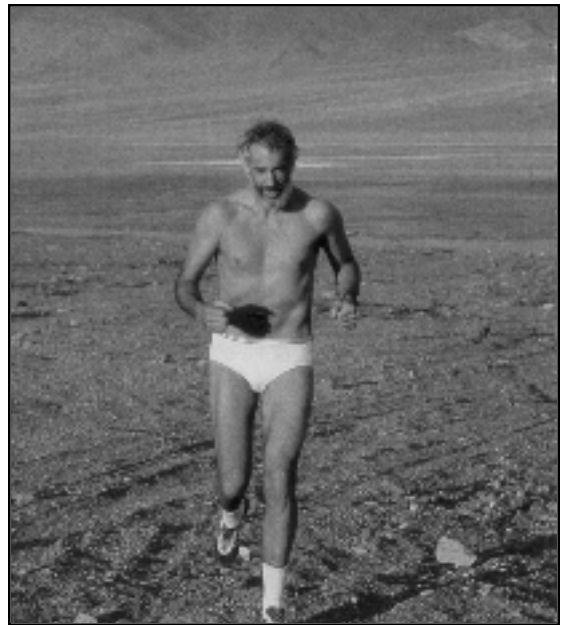
From athlete to invalid...and back, Al Arnold is perhaps the ultimate example of human potential and survival. ROGER ALLENBONE meets an Iron Man with an iron will.

This is the saga of one man's defiant pilgrimage to the breaking point of human endurance, and beyond ... and of how Mother Nature extracted a crushing revenge. It's the story of Al Arnold. Occupation: runner, surfer, lover and journeyman-tinkerer with all things mental and mechanical, frontier scout for the tribal consciousness. When the history of California's human potential movement of the 70s is written, Al Arnold will be one of its extradimensional heroes.

For, at the age of 50, this shambling phantom from suburbia tucked his rubbery body inside a white flannel cape and set out in a quest of his impossible dream – to run non-stop from the subterranean swelter of America's Death Valley to the freezing granite peaks of Mount Whitney, at 14,496 ft the highest point in the continental United States. Could a man, half a century old, jog ... walk ...run, or even drag himself, across 145 miles of some of the most awesome and inhospitable desert and mountain terrain to be found anywhere in the world?

Al Arnold had already broken his body on those hostile elements enough times to know that only a superman could take on such a challenge. Yet, with three previous attempts at Death Valley, the thousands and thousands of miles of training, years of mental preparation – all his experience – told him it could be done.

What price would he pay? Not even his wildest guesses could have foreseen that the road he was embarking wouldn't end



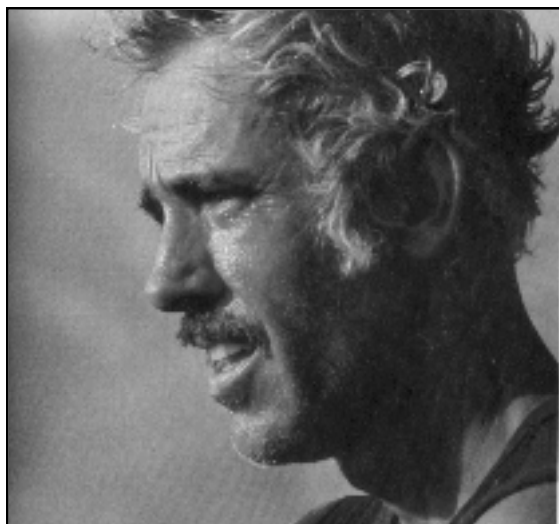
atop the Sierra Nevada. Instead, the forces which had fascinated the grey-haired, thick-boned athlete since childhood lay poised in wait at a more distant destination ... the thundering surfline of Hawaii. Within days of pitting his strength against the eerie western badlands, Al Arnold found himself trapped and fighting for his life beneath a massive wall of water. A new element had taken his proud body and snapped it in an instant on the ocean floor. Those powerful limbs which had seemed invincible were suddenly senseless and inert. Al Arnold was at the real breaking point – a breathless quadriplegic being smashed about below the waves with only his mighty will left to save him.

Since the end of World War II, California has been the birthplace of a succession of revolutions including the aerospace and entertainment industries, the student power movement, and more recently, the human potential disciplines. One of the expressions of this growing individual

awareness in the 70s has been the boom in physical exercise and recreation. With its temperate climate and year-round sunshine, the Golden State has nurtured legions of New Age warriors—backpackers, cross-country skiers and cyclists, along with the most noticeable and prolific cult, the joggers.

Clubs like the Quail Boulevard Athletic Club at Walnut Creek sprang up throughout California in recent years to cater for older jocks who still prefer the familiar combat of the gymnasium, weight room and handball courts into the new wave of Zen mystics whispering around the running tracks. Al Arnold was the perfect mentor to oversee the several hundred members who regularly work out on the basketball court, par course and heavy metal facilities at Quail Court. He loves to compete. The kind of urger needed about the locker room to taunt the boys into a thousand or so push-ups and some strength tests pumping iron.

Al Arnold suffers from a chronic Skinny Kid syndrome. Back in the 30s when he was six years old and hanging around the San Pedro beachfront and the Los



Angeles breakwater, a tidal wave warning sent most of the locals scurrying inland. But Arnold, determined to prove his courage, grabbed an inflated tyre tube and paddled out to sea to await the 25ft wave which dumped the boy onto a pile of sandbags lining the roof of the two-story bathhouse. Miraculously, the child was unhurt.

At high school, Arnold was 6'5" and only 135lbs when he played on the football, basketball, track and baseball teams. Three years in the armed services, then college athletics including rowing, rugby, boxing and weightlifting converted the spindly youth into a 273lb giant. He could pick up the back end of a 1950 Ford and just to show the world, he and a college friend set a 72-hour record for teeter-tottering. The pair went up and down on the see-saw 46,000 times. Anything to be different. "It's always been part of my make-up," he recalls, "If the crowded masses are going this way, I'm headed in the other direction. It's harder to be that way but you enjoy more about life."

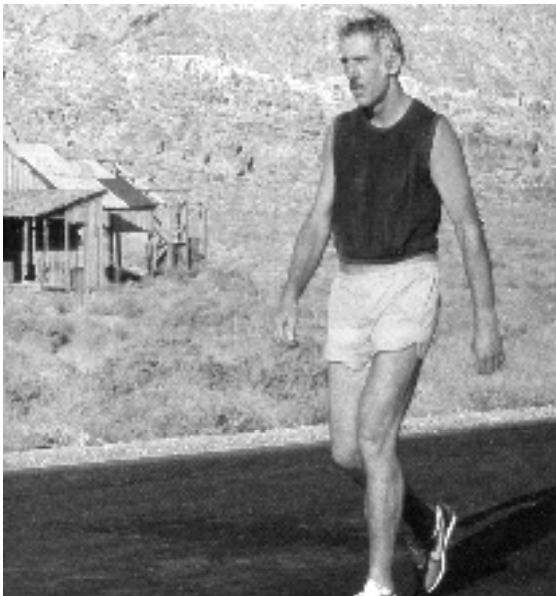
Although he originally entered college in 1950, Arnold drifted through a succession of undergraduate courses and in and out of the first of his three marriages. He finally graduated in 1962 and went to work at the University of California's engineering school where he spent the next 15 years as an electromechanical technician in oceanographic work. He specialized in building equipment to simulate and test the force of breaking waves, particularly tidal waves. What effect would a single wave have crashing onto a beach that was almost eroded?

In his personal relationships, Arnold was unforgiving. A second turbulent marriage broke up, he dropped out of graduate school, and for relief, he turned to sports. But on top of the anxiety and stress, Arnold developed glaucoma which

deprived him of the hand-eye coordination needed for tennis and handball. So, at the age of 40, he took up running and swimming again to help him cope with the pressures in his life.

Running can easily become an addiction. Once the weekend jogger has run in a City-to-Surf or Bay-to-Breakers race then a whole new world of potential opens up. Would it be possible to make a marathon? How far and how fast can I go? These are the kinds of thoughts one dwells on as the imagination tries to block out the pain of each mile.

In Al Arnold, such thoughts had to be extreme. He had always been impressed by the desolation of Death Valley. He wanted to attempt the perilous run non-stop in the scorching heat of mid-summer.



"I'm essentially a lazy man and it takes an awful lot to challenge me. I guess I enjoy having my back against the wall."

Arnold, the student of forces and balance, had very little idea of how to prepare for the grueling trial. But he'd kept in shape with regular running and swimming. Taking two friends as a support team, the

tall athlete covered only 18 miles in his first attempt at the run in 1974. The air temperature on the day was 139-degrees.

"I felt like somebody hit me in the middle of the stomach with a 16 lb shot," said Arnold as he described how quickly his body had dehydrated. "I vomited and had no strength to move ... could hardly breathe. Your pulse rate changes, the blood pressure and body temperature go crazy ... you begin to pass out. It's a very precarious position because if your heart goes into ventriculation then you could easily die from heat prostration. That's what happens when tourists driving through Death Valley stop to sightsee and never make it back to their car."

"My friends and family thought that would have to be the end of my wild ideas, especially as I'd nearly lost my life, but I wasn't going to let go of that dream so easily."

Arnold changed gears into a much more strenuous training program. He set up an exercise bike in a 200-degree sauna and began riding 45-minute sessions to acclimate himself to the heat and stress he'd undergone in the desert. At first he'd stagger nauseous from the sauna but gradually his physiology began to change. "I've never been able to conquer the stress level of my nerve which controls all of the vital functions of your body if it goes into a shock situation."

"My body temperature is now 97.6 degrees, whereas before it was 98.6. It can be 20 degrees outside at night and yet I can sleep naked with just a sheet over me." He also started running long hours around Mount Diablo, a 4000 ft peak overlooking Walnut Creek, 20 miles from the San Francisco Bay."

The intensive exercise whittled Arnold's frame down to 200 lbs and on a "cool" August day in 1975, with the barometer at only 105 degrees, a second attempt was made. He didn't get far.

"I hyper extended my right knee – it swelled up to the size of a cantaloupe and wouldn't support my weight after the first 50 miles." Undaunted, the veteran went back into even more rigorous training mixing the sauna-cycling with two swims and half-day mountain jogs. But in 1976, a test run lasted only 60 miles so he decided against taking a support team into the desert that year."

Arnold, then aged 48, had married for a third time in October 1975. His new wife, Betty Marie, was 34. He didn't look much older. Arnold also took on a seven-year old stepdaughter to add to the three daughters from his previous marriages. By that stage his whole family had given up on attempts to talk him out of his Death Valley obsession.

"In 1977, I didn't tell anyone what I was doing. I just went out and averaged 45-50 miles a day, four or five times a week. I would run all night and all day, whole weekends non-stop on the mountain ... walk ... jog ... walk ...jog. I'd do a circuit that brought me back to my car for a drink or else I'd tie a hiker's cup around my waist and sniff out the streams.

"When you initiate a long-distance program like this, you have to start with a mind effort. Then it becomes a conditional reflex. The body settles down and your mind departs. There have been times I've started to run on Mount Diablo before dawn. The next thing I remembered was the full moon coming over the mountain the following night.

"I'd have no recollection what went on during the day ... a total escape out of mind for 14-15 hours. I simply became an animal on that mountain. Sure, sometimes I'd think about my family, or work out a mathematical problem or notice how beautiful the country was ... but then it would be one-step-in-front-of-the-other, my mind would be a blank, sort of in hypnosis ... what you'd call a deep and involved trip.

"Unless you're a marathoner, you can't imagine how different it is. The long distance running and five-mile rowing races were the most difficult events I'd attacked. You almost have to be a masochist – enjoy pain. Except the pain is totally removed from your body. It's non-threatening."

Arnold taught himself to pace a 20-minute mile, keeping his pulse rate at a steady 120. "At that rate I knew I wouldn't have any concern with my heart on the Death Valley-Mount Whitney run. I'd think of myself as a refrigerator door. A hinge might break – my knee or hip might collapse – so I had to keep the stress level very, very low."

Death Valley is an inferno of sun-blistered salt flats, endless gravel fans, sand dunes and parched creek beds sagging between craggy canyons and cliffs which rise as high as two-miles above the desert floor. Amid the bristlecone pines and pickleweed, lizards, scorpions and sidewinders crackle and rattle across the shale slopes. Yet these gigantic, bleak badlands have an awesome beauty despite the fact that it rarely rains and the mercury dries in the thermometer with ground surface temperatures soaring as high as 190 degrees in summer.

"If you don't have thorns, thistles or sting, then you don't belong there," Al Arnold is fond of saying. He'd chosen to begin his

run before dawn on August 3, 1977 which turned out to be the hottest day of the year in the southwest.

His task was to start in Badwater (300 ft below sea level and the lowest point in the Western Hemisphere) and jog, walk, climb the 145 miles to the top of 14,496 foot Mount Whitney which caps the Sierra Nevada on the western border of Death Valley. Under his belt, he had 12,000 miles of training, three previous gutbusting attempts, and the knowledge that this time no matter what, he would not give in.

AT 5 am, the temperature was already well over the century. "I wanted to go with the full moon so I could see it settling down over those mountains. There were one or two bats flying around and coyote here and there, but otherwise I was all by myself, no sounds at all. The support crew stayed back to have a few beers.

"I was excited about the beauty and fantasizing about the old prospectors, the Indians, the battles that might have been fought ... the people out here struggling or perishing maybe within a few feet of where I was running. Yet I was fully prepared, fully confident, eager, glad to be on my way and thrilled by the enormity of what I was trying to conquer."

As he paced along the highway, Arnold thought, "This whole run will be like an hydraulic shock ... if I push hard against it, it'll push hard against me, so I have to flow with it, settle down and relax because I know this is a privilege to be a small part of this massive country.

"I had to do it with humility. If I tried to attack, I'd fail. To run eight minute miles was attacking, to run them in nine was still attacking ... I had to drop down to 15 even 20 minutes for a mile. That takes a

whole different motor response in the muscles. You don't have the momentum going for you.

"It's a matter of conserving energy, keeping the pulse rate low and preserving your fluids. It's as if you were making a lemon meringue pie-fold it too fast and you destroy it. That was my analogy: I was folding myself through the desert."

He also had to forget about how long the run would take. Instead, he concentrated on the scenery – the sheer cliffs leading to Dante's Viewpoint, the red sunrise, purple mountains and white clouds in the background, the golden sands beside the highway. He was working himself into the necessary trance. But soon after dawn he realized this was an experience he'd have to share, for a procession of tourists, park rangers and maintenance crews driving through the Valley all stopped to gawp at the strange desert apparition running through the shimmering heat haze.

"The short breaks spent explaining what I was doing weren't wasted even though they were included in the overall time. I couldn't have gotten anywhere if I'd have ignored those spectators-too many athletes fail to acknowledge the appreciation of other people."

After signing autographs and posing for pictures, Arnold descended down into Furnace Creek, then pushed through the Devil's Golf course to Stovepipe Wells. In spite of all the public relations, he'd covered 40 miles in 10 hours. Then came the mile-high climb along the steep slopes of the Panamint Mountains-gaunt, eroded rock formations where stray burros, bighorn sheep and mountain lions climbed among the mesquite. But the 15-mile climb was taking its toll.

"I was nearly to the top when I had a lot of problems with my knee. It wouldn't take my weight and I got sick." Arnold's two-man support team, Erick Rahkonen, a newspaper photographer, and Glenn Phillips, a commercial pilot, were also sick after a long day driving slowly through the boiling heat.

"We tried to pull it together but I realized I was pushing my luck pretty hard. I couldn't run any more so we had to stop there while I spent hours and hours on stretching exercises trying to get my knee back into shape. I knew I wasn't going to stop. I just shut my mind off to that possibility."

Arnold pushed on through the dawn of the second day. A road maintenance gang fed him beer and sandwiches and relayed the news of the runner's progress to workers further up the line. To ward off the intense heat, he ran in his "Lawrence of Arabia" garb—a white tennis hat fitted with a flannel shield that draped over his neck and shoulders.

Descending into the Panamint desert, Arnold met a geologist returning from a desert checkpoint where the air temperature was 138 degrees. The runner consoled himself with periodic ice-water showers and guzzled down cool drinks. During the run he consumed 30 gallons of fluids.

"The worst part of the run was the first 15 hours. The enormity of the heat gets compounded by the fact your adrenaline is up - the two elements combined could have been devastating. But then on the second day I relaxed ... maybe I should have begun to run a day earlier."

He had to climb over the Inyo mountains before descending into the searing Owens Valley where violent winds blasted him with sand and silt. "That was the first

time I could see Mount Whitney and I said to her, 'Well, you probably thought you'd never see me but I'm going to be on top of you.' She's a very powerful lady and I didn't want to conquer her - just be part of a relationship.

"Still, there were so many miles left to run. I immediately wiped it out of my mind and concentrated on putting one-foot-in-front-of-the-other on the white line marked on the roadside. I just glued myself to the line. I didn't dare look left or right. I was locked in a hypnotic trance. The photos taken of me at 100 miles shows a red glow around my body.

I couldn't even look back to glorify what I'd already done. Sometimes I got lonely and felt like crying a few times. My body was going through tremendous stress. Yet I felt there was something out there helping me ... a God, a religion, a what-have-you ... I'm not a church-going person but I have a strong feeling that we're here for a purpose and not by chance. That feeling seemed very strong while I was out there running."

Arnold maintained the rhythmic jog, walk, jog along Highway 136 leading to the small settlement of Lone Pine. "People started coming out of town saying, 'There's a crazy man who's just run from Death Valley!' and took photographs. Three girls offered to massage me. But that would have blown the run."

At last, Arnold reached the Sierra foothills. It was a hard climb from Lone Pine at 3000 ft up to the end of the asphalt at 8000 ft Whitney Portals. He then faced an even steeper ascent 10 miles up a rugged trail along the cliffs to the top of 14,496 ft Mount Whitney. "It was still one-foot-in-front-of-the-other ... I was just going from rock to rock.

"But as I got closer and closer, I was more relaxed. I could look around. One of my support crew ran ahead to tell hikers what I'd done. They all cheered and congratulated me – it was like a ticker-tape parade although I was weaving and staggering along the path and a couple of times they had to hold me up. One foot wrong and I'd have fallen several thousand feet to my death.

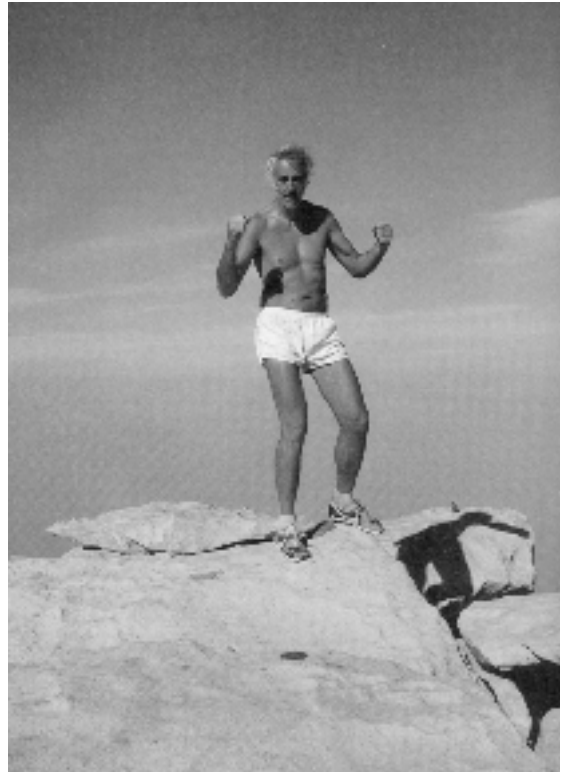
"Then I became obsessed by the need for total quiet. When I got up there, about 50 yards from the top, I sat down and did some stretching exercises and looked up at the sky. Then I very leisurely walked up to the summit and burst into tears. I couldn't stop crying. My friend turned to me and said, 'You son-of-a-bitch ... I never knew you had a soft bone in your body.' The hikers standing around hugged me.

"I just stood up there and looked back to where I'd started and I couldn't believe it. You couldn't even begin to see where I'd started. There was a valley, then a mountain, a valley and a mountain, disappearing 144 miles into the haze. It had taken me 84 hours. Maybe some day I'll go back there and realize what I've done."

Yet at that stage, Al Arnold was in a precarious situation. The sun was setting on the cold mountaintop. He was dressed in only his thin running shorts. Tired as he was, the big athlete accelerated down the trail to Consolation Lakes.

His companion had already pushed on to report the news to Lone Pine before Arnold discovered his camping gear, left for him beside the trail, had been stolen. The runner was in real trouble. All he had was a thin plastic survival sheet to wrap

around his almost naked body. "I had to sit down on that granite mountain at 12,000 ft and experience the temperature



falling below 20 degrees. With the wind howling, the chill factor was below zero. Despite all the exertion, I still couldn't sleep. During the night, I watched the satellites and constellations, waiting for the sun to come up. I was shivering but I wasn't frightened or lonely, not even hungry. It was simply another challenge ... one-step-in-front-of-the-other.

"When I stood up in the morning, the left knee wouldn't work. I had to soak it in an icy stream for three hours before it'd click back into place." Eventually he made it into Lone Pine and home to Walnut Creek. "My wife wanted me to get some sun," he smiled wryly, "so we went to Hawaii." At Brennecke's Beach on the island of Kauai, Al Arnold was able to indulge his other great love - bodysurfing. Already he was in training for the American Master's swimming titles. It was the tenth day of his vacation and he'd spent most of the afternoon lapping the beach and riding waves. But when he caught a longcrested "bonsai" wave, it suddenly sucked out. As

he tried to avoid a young surfer on a boogie board, the dumper spearheaded Arnold into the sandbar.

The impact totally dislocated the whole cervical area of his neck, separated both shoulders and caused a severe contusion to the athlete's spinal cord. "I was totally paralyzed under the water and being repeatedly pounded into the sandbar by this huge wave. It seemed to happen in slow motion. I realized I couldn't get up for a breath.

"Immediately I was embarrassed about losing my life. I thought it wouldn't be fair to my wife. But I was helpless. The only force I had going for me was my mind. I just held my breath ... one-foot-in-front-of-the-other ... one-more-second ...one-more-second ...then my face came out of the water, I gulped in air, then went back down eating sand. I came up about seven times before I was rolled ashore. As the waves sucked me back out I used my last gasp to call another swimmer who hauled me onto the beach."

In the hospital, Arnold's crippled body was wedged between sandbags to keep him from moving while doctors x-ray the neck to see if it is broken. "At first they thought I'd been mugged. My face and scalp were covered with welts and burns from the sand. My body felt like millions of needles had been stuck in me. "The only feeling I had below my neck was some movement in my little fingers and big toes. My wife was there and I felt sorry for her, but there was no point feeling sorry for myself. I was just waiting for them to tell me I had a broken neck.

"But because of all the intense training I'd done for Death Valley, the stretching and conditioning, everything came back into

place. Anybody else would have either been drowned, or finished their days in a body cast."

Five days after the accident, the runner, still paralyzed, was folded into a wheelchair and flown home to Walnut Creek. "It was an interesting experience to be totally dependent on other people. My body was in neurological confusion. I was excited – this was another challenge."

The runner used his enormous concentration and discipline to visualize the extent of his injuries and recapture his sense of movement. Within weeks he was standing and taking a few tentative steps. Then he began to slowly jog. Three weeks after the surfing accident, he'd run 10 miles across country although he couldn't hold a pen to write, tie his shoelaces or even go to the toilet without help.

A week later, Al Arnold was on the starting line for San Francisco's Bridge-to-Bridge race. He ran the 7.2 miles in 65 minutes, only 12 minutes slower than his best time for the distance. "I was really excited ... the further I went the faster I got. I was passing people.

"I'm not a puritan. I'm devious. When I complete I like to know how many people I can beat. After running Death Valley I'd found out some other guy was training to do it. When he heard I'd made it all the way to the top of Mount Whitney, he was terribly disappointed and cried. Boy! Did I gloat ... perhaps that's selfish but it's an indication of how serious a 50-year-old man can be."

However the initial recovery owed a great deal to the remaining condition from the Death Valley run. In the following weeks, business pressures prevented Arnold from returning to Mount Diablo and it was two months after the accident before he could settle into a routine using a weight-

ed rowing machine he designed himself and the heavy punching bag to begin regaining the power in his arms and shoulders.

"At present, my strength is about 20 percent of what it was," he told me in October. "If I bend my neck then my whole body becomes numb. But I've got to do this myself. The doctors originally told me I'd need a walker for at least six weeks. But I left it at the hospital.

"Sure ... I listen to medical advice. But there's still a lot of mystique surrounding medicine and they don't know much about sporting injuries. So I'm going on my gut feelings. It's not a question of whether I make a full recovery. My only concern is whether I make a damned good effort. It can be, it will be."

The Quail Boulevard Athletic Club has a number of orthopedic surgeons among its members. Several have refused to talk to Arnold about the accident. "The people they treat can't even begin to approach what I'm doing. But whether the doctors listen or not, I feel I've got a unique insight into what the human body can achieve.

"I love my body whether it's in condition or like this. At the same time I think maybe this experience will motivate someone less fortunate. The one point that keeps going through my mind is – 'train for the breaking point' – I've always pushed myself through the miles of arduous conditions, the tremendous heat and mental discipline ... I went to the very limit and finally reached the breaking point in the surf.

"I was able to meet it because I was adequately prepared ... not so much in the body, but in the mind. Lesser people would have been panic stricken or drowned. I came out a winner even

thought I may be permanently disabled. The injuries would be just another asset. You see, when I lost the power of my eyes, I developed into a runner. Now, who knows where this challenge will take me? Maybe I can pioneer techniques that could rehabilitate handicapped people."

Arnold acknowledges he's not an ordinary person. "If reincarnation is true, then I must have lived before as some kind of scout with an army or with pioneer settlers. I really feel that you could drop me almost anywhere in the world and, barring human adversity, I'd survive."

The members of the Quail Boulevard Athletic Club agree. They've given him until July 1 to rebuild his crippled body. "My biceps will go from 13 to 17 inches. I'll build up my neck, my abdominals, there'll be no fat. I'll be really powerful. Then I'm taking them on.

"I'm going to run against a horse and rider over a 100-mile course in the Sierra Nevada. I'll have to cross 50 miles of desert without water. I'm going to learn to swim again and compete in the Masters' titles in 1979. I know that as I get older and older, I get better and better while everyone else falls apart. It's no use trying to domesticate this man. I'd only be a caged animal."

Crewing Tips

By First Lady Denise Jones

Due to the unique nature of the Badwater Ultramarathon, we thought it might be helpful to make some suggestions with the hopes that they might insure a successful experience for both the competitors and their crew members. As most of you know, the crew is essential to the competitor completing this event and is, in fact, required by the race rules. Crewing for this race can be as taxing as competing (we've done both). Thus, we share some ideas that have helped us during the event.

You can expect:

EXTREME HEAT

EXTREME EXHAUSTION

EXTREME FRUSTRATION at times

EXTREME CONFUSION

EXTREME JOY...when it's over!!!!

1. The crew needs to familiarize themselves with the crew vehicle and it's organization. It would be advantageous for the athlete to be involved in setting the crew vehicle up so it can be arranged in a manner that makes logical sense to everyone that will be working out of it. Keeping the crew vehicle clean and organized helps everyone, too. Putting things back where you found them makes it easier for the next person on shift.

2. Crew members should decide in advance when rest breaks will take place, so that at least one crew member is always well rested. If there are more than two crew, it's a bit easier to take rest breaks. During the rest, try to rest or sleep. A tired crew is no help to the athlete. We get motel rooms for our crew, but I know it's not always possible due to some budgets. If at least one crew member is mentally sharp and fairly well rested, it makes the entire experience run more smoothly. By

the time the competitor is tired, decisions are harder. If everyone is tired, it's much harder to keep the competitor moving.

3. Hopefully the crew will be familiar with blister treatment. If not, please try to get some help before the race starts with someone that has treated blisters. Often, it seems, even when most athletes don't usually have blister problems, they tend to blister in this race due to the excessive heat of the pavement. Try to have a blister kit organized specifically for this issue. It's been a lifesaver for most competitors.

4. It has been our experience that if a water sprayer is used for cooling down the athlete, avoiding the legs is helpful. It seems that when the water runs down the legs, feet blister more, and can cause chafing of the thighs. One competitor had to drop out a couple of years ago due to the crew not knowing this. Sometimes athletes like their legs cooled, but be sure to



PHOTO: CHRIS KOSTIVAN

Major W.C. Maples and Crewmember - 2000

check first before letting loose with the sprayer. Don't be surprised if your athlete gets heat rash on legs. I've had it twice in this event. It goes away and Desetin ointment helps!

5. Crews need to be aware that they **MUST** drink fluids to prevent dehydration...not just the athlete. We've seen a lot of sick crew from not watching out for their own welfare while in the throws of crewing. It's easy to get distracted and forget to

drink...! Iced fluids seem to keep the body temperature down better. We ice everything.

6. Sunscreen and sun protective clothing (such as Sun Precautions) are necessary for crewing, as well as running. Sunburned crew aren't happy crew. Hats are essential. The hazards of sunburn, dehydration, and sunstroke are very real for the crew as well as the athlete. Beware of how quickly this can happen. It can happen in as little as 15 minutes.

7. Hopefully, crew members will cooperate with each other to make the whole experience a memorable one. Communicate with the athlete, and with each other as crew members. Watch your athlete's moods and behavior. Low moods are expected at times, but sometimes can indicate low blood sugar. It's as simple as giving something with sugar in it to help.

8. If you encounter problems with your vehicle or your athlete, please let the organizers know. Race officials skirt the course. Ben will be doing the same thing, to see how everyone is doing. Just let him know and he'll notify his fellow race organizers. The sooner a problem is addressed, the soon is can be resolved. We've even encountered flat tires out there. The U-Haul company sent mechanics out on the course (from Ridgecrest) to fix our tire while we continued in the race (of course we had dual wheels).

9. Watch out for the traffic. Be careful crossing the road on foot. Make sure your crew vehicle is parked completely off the pavement so you won't get a ticket or cause an accident.

10. Please don't litter!

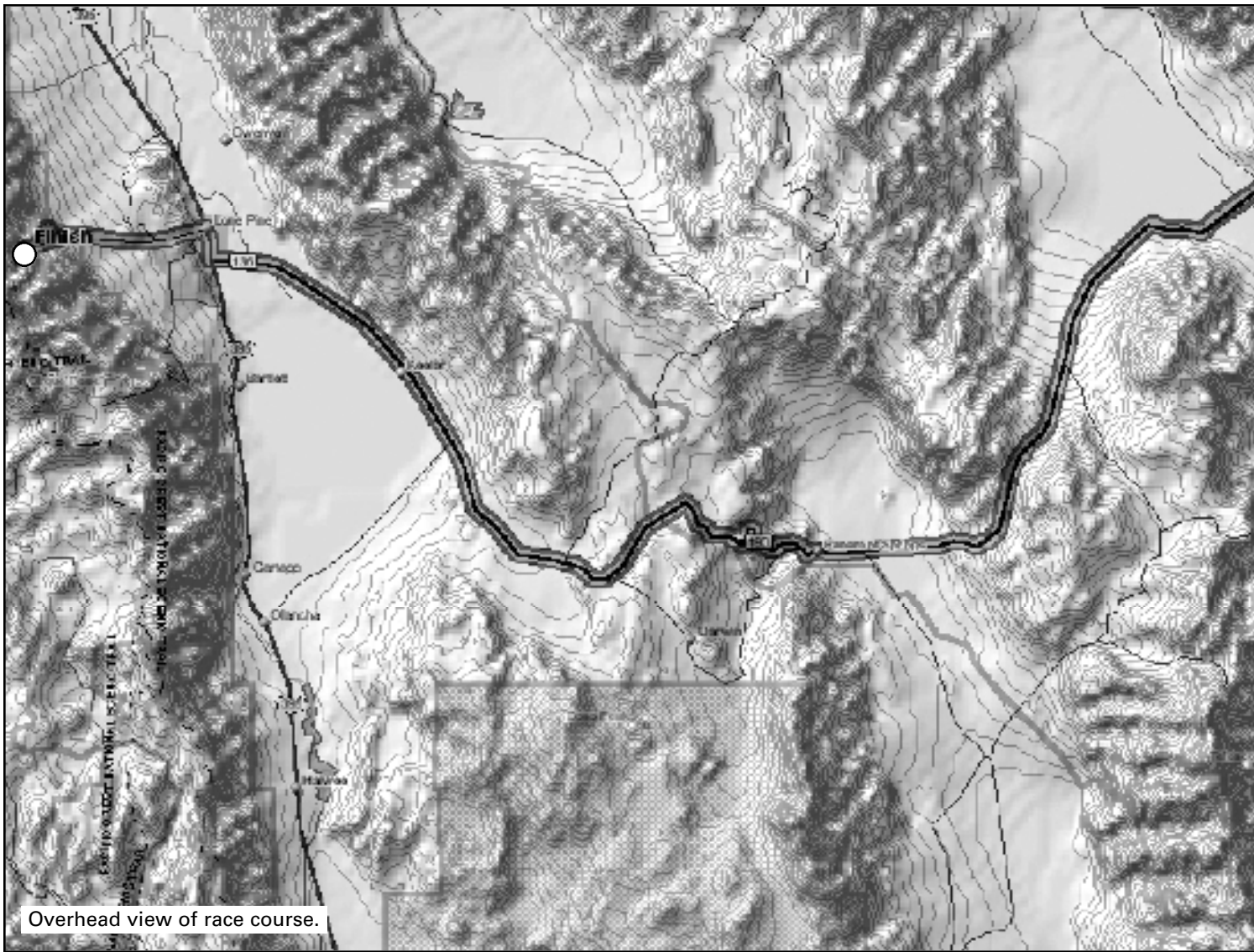
The Badwater Ultramarathon is a unique event. It is.... EXTREME! Please understand that by your crewing you are helping your athlete complete a very important

goal. Good crew attitudes along with good manners and organization can make this an amazing and thrilling experience for everyone. You will enjoy a great sense of achievement to have joined your athlete in this event. We truly believe that no one who participates in this event leaves it the same. It will be a very memorable life experience, and we know your athlete will be grateful to you for your help forever! And, last but not least, we are hoping that everyone has a memorable, enjoyable and successful race in 2002!

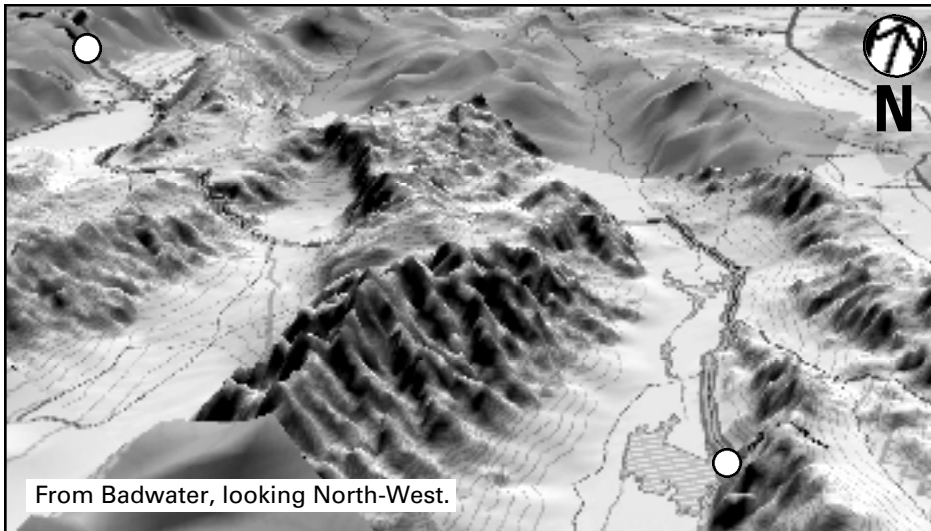


Dan Jensen - 1999

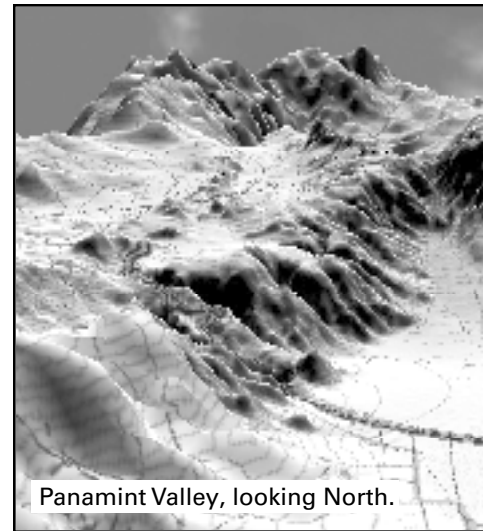
PHOTO: CHRIS KOSTMAN



Overhead view of race course.



From Badwater, looking North-West.



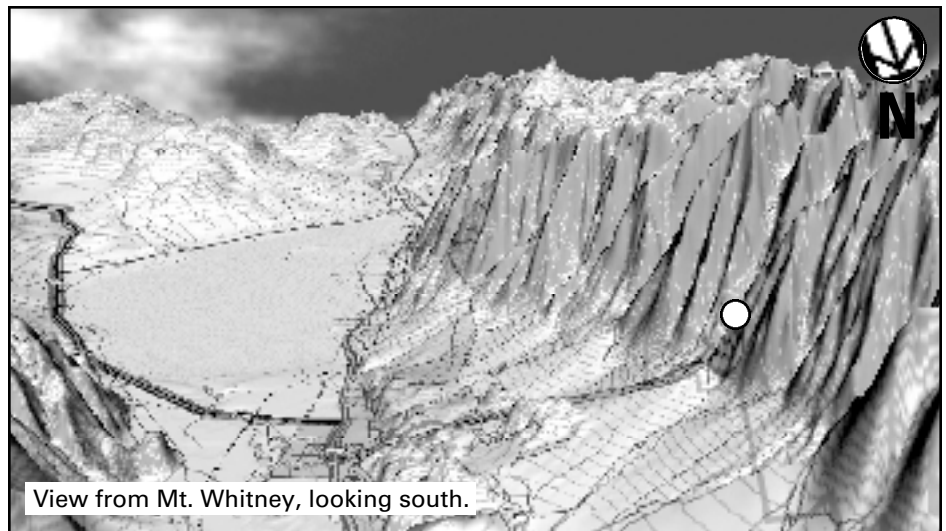
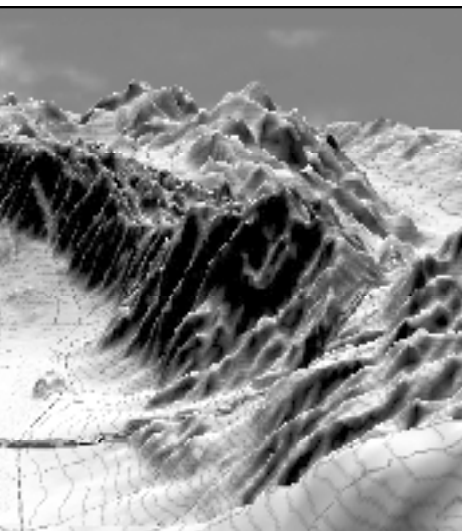
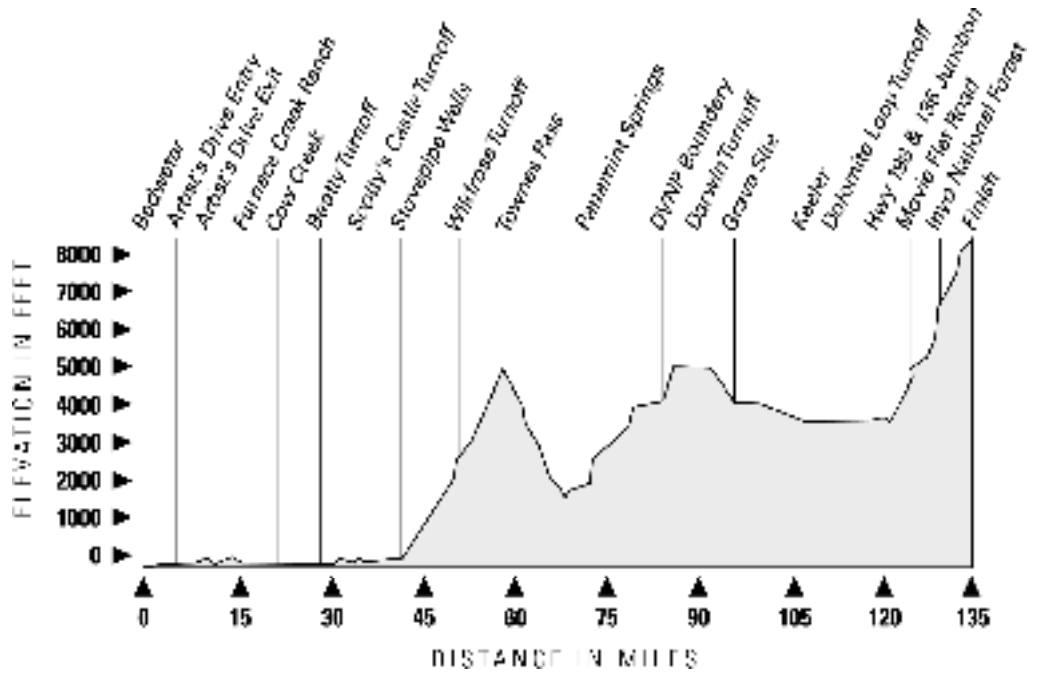
Panamint Valley, looking North.

3D Topographic maps by Doug "Dog" Sloan

Badwater

UltraMarathon

25th Anniversary '77-'02



View from Mt. Whitney, looking south.

Badwater Blister Buster

By First Lady Denise Jones

Running Badwater is the true test of an athlete's endurance, training, tactics and proper body maintenance. One of the obstacles that seems to prevent many from finishing is problems with blistering. Before competing in my first Hi-Tec Badwater race in 1994, I had the privilege of Rhonda Provost teaching me foot-care techniques. (In 1995 she became the first woman to do the double-crossing from Badwater to Whitney and back.) Since that time, I've taken advice from other runners as well, with the hopes that we could devise some way to prevent the inevitable blistering problems that develop during this event. When I competed the second time in 1996, I was able to finish the race with NO blisters at all by using the following techniques. My hope is that these tips will help you, the competitor, successfully travel this course in more comfort, due to sharing the techniques I have learned over the years.

I have seen and worked on feet so unbelievably blistered from this event it would make you think they have been boiled in oil. Often it has been a complete surprise to the athlete, as more often it seems many have taken it for granted that they won't blister in Badwater because they don't blister in other 100 milers. Please take the precautions, and maybe you can get through this event without them! Even with these measures I suggest, it's not always the cure. In 1998 I spent significant time with Robert Thurber from Texas. By Panamint (72 miles) even with prior taping, his feet were so bad he had to be carried off the course. I tried everything to prevent this from happening to him, but his calluses were very thick, and he had blistered massively on his heels under them.

I also highly recommend the book advertised in UltraRunning Magazine, "Fixing Your Feet", by John Vonhof. It is a very complete practical synthesis on proper foot care. He goes into a lot of specifics on every detail of foot care, and where things can be purchased. It's just great and I believe every competitor would benefit from using it.

My booklet is specific to Badwater, therefore it might differ somewhat from the techniques that Vonhof recommends in his book.

Items for foot care box:

- Swabs (for applying benzoin.)
- Toe nail clippers, fingernail file, pedicure file.
- Alcohol swipes.
- Tincture of Benzoin (it also comes in spray.)
- Sharp scissors (very pointed.)
- Tweezers to pull blister out to cut a hole in it.
- Tapes (Micropore and Elastikon.)
- Foot powder
- Betadine (for cleansing.)
- Extra Socks
- Second Skin (A gel for burns and blisters.)

Preparation of Feet Before Race:

File down any calluses with a pedicure file so that if a blister develops you can get to it so it can be treated. If thick calluses are allowed to remain, they are next to impossible to get underneath to fix the blister during this event. Many times it has caused an athlete to drop out. Trim toenails (square) and file them so no rough edges remain.

Pre-Race Taping:

I recommend pre-taping the night before the race so the tape has time to conform to your feet. By taping the night before, it's one less thing to get together on race day, and if anything comes unstuck it will take less time to fix. Micropore (by 3M) seems

to work well (it is like paper) and conforms to the shape of the foot. Another tape that has been helpful is Elastikon (by Johnson&Johnson). It is slightly thicker and stretchy for the heels and balls of the foot and it is breathable. **I DO NOT** recommend duct tape. We have found that duct tape doesn't breathe and causes the area that has been taped to become edematous, sometimes causing worse blisters underneath the tape. It also tears the skin that has been taped when it's removed, causing a great deal of pain. Pre-tape any areas that have blistered before, or might be a friction point. Spread Tincture of Benzoin (from a pharmacy) over the area to be taped. Allow the Tincture to become tacky, then tape as flatly and neatly as possible. Cut off any wrinkles or corners of the tape.

Socks:

Make sure you've tried your socks prior to the event. Everyone seems to have their own favorite. Ultrathins, double layer, Ultimax, and Thorlos are all good. Seams are sometimes a problem. It can help to turn the seam-side out. Any sock needs to fit well, with no wrinkling. Cotton socks provide no wicking and tend to make balls (pills). Any amount of sand in a sock seems to cause blistering.

Shoes:

Make sure shoes aren't black as they absorb too much heat. Make sure insoles are insulating. I wear very padded orthotics that also provide insulation against the heat. Consider extra cushioning but don't try something you haven't trained with. Ankle nylons have been used to provide the innermost layer, then ultrathin socks. Personally, I found them too slippery. They caused my feet to move around too much in the shoe, which can also cause blisters. Have an extra pair of shoes available in case your feet swell. It also helps to keep them in a zip-lock bag in

the ice chest, if you have room, to keep them cool. I've been able to complete the race in the same pair of shoes, however.

Treating Blisters After They Develop:

Clean the area with alcohol. Drain blister by cutting a hole in it, (a small hole not a pin prick.) This prevents the blister from refilling. Place Second Skin over the blister. Try to leave skin intact over the blister. Treat the area with Tincture of Benzoin, once again, so that the tape will stick. Tape over Second Skin. Once the skin is moist from sweat, it's harder to get the tape to stick. I use foot powder (Zsasorb) to dry the feet after the benzoin and before the taping.

Lanolin or Vaseline:

Some runners like to use these preparations to prevent blistering. I have found that they don't work for me. The drier I can keep my feet, the better. However, if using such a preparation has worked for you and you've trained in the desert with it, then by all means use it!

Compeed:

I have had no success using Compeed for Badwater. Others have used it to alleviate the pain of a blister quickly. The problem seems to be that it might help at the immediate time, but trying to get it off is a nightmare. It sticks to the skin and shifts. I treated three athletes one year that were in terrible pain from Duct Tape and Compeed. They wanted to climb Whitney after the race and their feet were in such bad shape they could hardly walk. In trying to remove it, the skin over the blister and the tissue underneath often comes off. The raw flesh is very tender and susceptible to infection. You might try it as a last ditch resort, but I've treated some very painful feet due to it's use.

Medical Risks in the Badwater Ultramarathon

This 135 mile race is probably the most physically taxing competitive event in the world. It also has considerable medical risks. All runners and crews must appreciate these two facts both before and during the race.

Heat illness and heat stroke are serious risks. These can cause death, renal shut-down, and brain damage. It is important that runners and crews be aware of the symptoms of impending heat illness. These include: nausea, vomiting, headache, dizziness, faintness, irritability, lassitude, weakness, and rapid heart rate. Impending heat stroke may be signaled by a decrease in sweating and goose bumps, especially over the chest. Heat stroke may progress from minimal symptoms to complete collapse in a very short period of time. Deaths and renal shutdown (kidney failure) have been reported in other ultramarathons. Adequate conditioning is mandatory.

Adequate fluid and electrolyte intake is the most important preventative for heat illness. Runners may well require dozens of gallons of fluid during this race. Proper pace is crucial.

The high altitude plus exertion can also produce various degrees of altitude sickness. This can lead to severe lung and brain swelling, and even death. The main treatment is rest, and especially to get to a lower altitude.

Blisters are also a problem on this course, with pavement temperatures perhaps reaching 200 degrees. Proper foot care & preparation are essential for having a successful race.

Remember, you are responsible for your well-being while participating in this race. **There are no aid stations.** Know where your limits are and know your body. Your acceptance of invitation to this race declares that you are aware of the risks & potential health problems.



PHOTO: CHRIS KOSTMAN

2001 10 AM starting line

Heat Training and Conditioning

By *Badwater Mayor Ben Jones, M.D.*

(Originally published in ULTRA Cycling Magazine. See www.ultracycling.com)

I recently had the honor of being asked by John Hughes, editor of Ultra Cycling Magazine, to prepare an article on heat acclimatization / training / conditioning for his magazine of which I have been receiving much appreciated complimentary copies. They go alongside my UltraRunning magazines.



PHOTO: TONY DIZINNO

There are, perhaps, several reasons I have been chosen to do this. One is that I am a long-time physician in the high desert area living and practicing in Lone Pine, California. It is at the foot of Mt. Whitney and at the threshold of Death Valley. I have treated cases of every imaginable medical circumstance including heat exhaustion and heat stroke (including disseminated intravascular coagulation). The other reason is that since 1990 I have been involved in the annual Hi-Tec Badwater/Whitney (formerly the Badwater 146) Race. In 1991, 1992 and 1993 I successfully completed the course. In 1991 my claim to fame happened during the race. About a week before 14 of us started at Badwater, Death Valley, there was known to be a trekker missing who had attempted to traverse Death Valley east to west 10 miles and then return. During the race, I was approaching Lone Pine some 122 miles later and saw the coroner traveling in the

direction of Death Valley. By the time I had made it to Whitney Portals at 135 miles, I got word that he wanted me to do an autopsy. I obliged and then re-entered the course to complete the event to the top of Whitney at 146 miles. I am the only one I have heard of who has ever performed an autopsy during a race. Besides that, I used a water-filled casket (body removal tank) for immersing myself in to cool down during the race. I am also the only one I have heard of to successfully get in and out of a casket to successfully finish a race.

There is some very good scientific information about heat acclimatization that is very informative and can be found in "Marathon and Beyond" in the July/August 1997 issue: "Into the Valley of Death" by Richard Benyo and "Beating the Heat" by David E. Martin, PhD. Another valuable piece is in the "Encyclopedia of Sports Medicine and Science" on "Heat Acclimatization" by Lawrence E. Armstrong, PhD. My information below is more of a "by the seat of the pants" approach.

What appears below is not based on any scientific evidence and should only be used as helpful hints for training. I am not sure how to correlate running and biking however I have usually felt it to be a 1-to-4 sort of thing. That is, about one mile of running equals the effort of four miles of biking. When I do get on a bike I use these conversion credits but one has to realize that I am not getting ready for RAAM or the Tour de France, etc., and I have already done Boston with a promise to the BAA that I won't bother them again. Anyway, the environment seems to go by about four times as fast with biking as it does with running. In low or absent humidity, as in the desert, there is greater perspiration loss with worse dehydration and a greater need for fluid replacement. There may be more with biking than with running as there is the effect of more wind to

create more evaporation. Bikers in the desert have repeatedly told me about this observation.

One advantage I have in regard to heat training and adaptation is that I live in the high desert in the Eastern Sierra. In Lone Pine, it gets to above 100 degrees F in the summer and it is very dry with less than 10% humidity. It is usually 20 degrees hotter in Death Valley no matter what time of day it is or what day of the year it is. All I have to do is go eastward and hang around in the heat (in dark clothes) and do some light exercise.

I began to increase my exposure to the heat in 1990 when I went out on the Badwater 146 course to see and help several friends who were in the Race. While training in 1991, I became acquainted with Richard Benyo and Tom Crawford of "Death Valley 300" fame; they had done the round trip from "Fire to Ice to Fire." As a result of this association and having done the autopsy, there was a touching ceremony at Badwater on 07-04-1992 where I was dubbed the "Mayor of Badwater" and my wife, Denise, the "First Lady of Badwater." I completed the Race in 1991, 1992 and 1993 and did not finish on the next two attempts in 1994 and 1996. My failure in 1994, after 40 miles, was because I did not start the race hydrated well enough and that I stopped manufacturing urine. I gave myself four liters of IV's as I laid on my casket in the U-Haul before I started putting out urine. I felt that, if I were to continue, I would wind up on the renal dialysis ward. In 1996 I was under a lot of stress from the horrible governmental and insurance company changes in the practice of medicine and was unable to properly train. Because of the extra heat that year and the resulting fatigue that existed, I pulled myself at 50 miles. I could have continued but I went ahead to support my wife and free up my crew for her as I would have finished beyond the 60-hour time limit. My wife finished successfully in 1994, 1996, and 1999.

Hi-Tec Sports, USA, Inc. put on the Race from 1987 through 1999 after Benyo and Crawford decided not to promote it as a race. They gave up when many of those wanting to do it kept inquiring about "where are the day-care-centers, hitching posts and ATM booths?" At that time Hi-Tec was promoting a running shoe called the "Badwater 146." The shoe failed but Adrian Crane and Tom Possert were successful in their challenge. Before them were several dozen solo performers who have been listed in Benyo's archives. The "mas macho" start-time has always been an AM-start such as at 0600 which Hi-Tec started doing in 1996. This interested and attracted even more runners than the earlier 1800 start-time. People seem to want to make it as difficult as possible to complete the six marathon-length course with 20,000 feet of climb and 8,000 feet of descent. There is also considerably more of a challenge and more heat exposure with a 0600 start. Besides this, it has been established to be within the "July-August" window. It is, of course, hotter than as it usually gets to 120 to 130 degrees in the daytime. There is a safer and a relatively non-mountaineering finish to the top of Mt. Whitney during those months. At 146 miles the contrast is remarkable in that it can be over 100 degrees cooler (at night) up there.

John first asks: "How long do you need to train in hot conditions to acclimate?" My answer is as long as possible but practically about three weeks. Try to spend as much time above 100 degrees F as possible and that means traveling to the low deserts of Southern California or the eastern desert areas such as Panamint Valley and Death Valley. It is necessary to spend time outdoors in these areas and just trying to relax while getting used to the heat. The training can be eased into. Of great importance is to have the potential crew members along also. The event being trained for can almost be more difficult and hazardous for them than for the per-

former. Most athletes cannot afford the time and cost of doing all of this, unfortunately.

The next question is: "When acclimating, how long and how hard should you exercise each day?" Long is more important than hard. Start easy and then work up. I like Walt Stack's creed of "start slowly and then taper off!" Calculate the distance being covered and the time limit imposed and go from there according to your capabilities. For the Hi-Tec Badwater/Whitney Race, 20-minute miles will cover the 135-mile course from Badwater to Whitney Portals in 45 hours. One can buckle in 48 hours. To be recognized as a finisher, 60 hours is the time limit. For this 135-mile Race, most of it is flat and I tried to do 15-minute miles for these 70 miles. I treated the 19 downhill-miles as flat miles at the same pace to save the legs. The uphill 18 miles from Stovepipe Wells Village to the top of Townes Pass and the 15 miles from Panamint Valley to the Darwin Flats I tried to do at a 20-minute-per-mile pace. For the steeper 13 miles from Lone Pine to the Portals, I tried to do at a 30-minute per-mile pace. The 11 miles up the Whitney trail I allowed a 1-mile-per-hour pace. So, setting a pace for the terrain of the anticipated race is necessary. This is not possible for a continuous race lasting more than 48 hours. The intensity and duration of training can be adjusted upwards for each additional day of training, but allow a few rest-days or, at least, a few rest-hours for you compulsive people. I would say try to do a mild level of exercise for about 8 to 10 hours each day. The intensity can be adjusted upwards to a moderate level later. It is virtually impossible and essentially inadvisable to train at an intense level in these conditions. Try to gauge how many hours or days it will take to get through the anticipated event and heat and practice accordingly.

The third question is: "Is passive acclimatization possible?" It certainly is and this is mostly what I do. Wear dark clothes while in the heat. Don't use air-conditioning. You can even roll up the windows of the vehicle and

turn on the heater. My exercise base has usually been 1-2 hours of exercise a day every day in my calculated fitness range. [This is three to six times what is needed for general and basic health]. I have always been at the back-of-the pack, or, as I often announce, in the top 98%. In getting ready for this race, I like to go out to the desert and just kick back and do some hiking as well as strolling on the dry lake beds and over the sand dunes. I take a camera and a micro cassette recorder as well as some techno-nerd items. Try to have fun and visit with other desert rats. Be sure to write up your story even if you "fail." Pass on what you learn. With progressive heat adaptation, I have found that I don't seem to sweat as much and my skin doesn't seem to taste as salty, even if I am not exercising at the time. Fluid and electrolyte and calorie replacement are extremely important in these conditions for you and your crew. These are separate issues which could be covered later. Passive conditioning can get you by better than vigorous exercise. Decide what it is that you are trying to accomplish and set some goals.

The last question is: "Can one simulate hot conditions at home?" Yes, and this has been done using a sauna and with maybe adding some minimal exercise. Get a medical checkup before starting all of the above activities. Another way to do it is wear extra (dark) clothing as mentioned above while exercising in desert-like conditions. Wear something which traps the heat for a while. Again, don't use air conditioning and roll up the windows and, if this doesn't do it, turn on the heater. I have done these things and when it is 120 degrees I don't even notice the blast from the heater. It does help the vehicle to run cooler. All of these things are useful. but the most important is to get in the right frame of mind about what is going to be done. You do have to get your skin, stomach and bladder through all of this too. I have had the advantage of living where I do and traveling frequently to the desert. I have practiced as a physician here since 1963 and have observed what can happen out here. Be careful!

Heat Training Analyzed

By Stephen Simmons

1999 Hi-Tec Badwater Finisher

After over a month of heat training preparation I was fortunate to have had a successful run from Badwater to the summit of Mt. Whitney in the July 99 Hi-Tec Badwater race. I had no real knowledge of heat training before I began heat training, but I posted questions about it to the ultra list and got responses from others who had experience with or were at least knowledgeable about heat training.

Many of the ideas expressed were scientific; I did my best to interpret them. Some were more simplified, and out of all of them, I tailored a regimen to suit me personally, as anyone should do. Regardless of the different approaches there are some ideas and beliefs about training for and performing in extreme heat that are common, and as a conclusion to my experience with heat, I will write some of the more basic and simple ideas that I think are sound advice and good knowledge for dealing with it. These are only my opinions, and this is what worked for me.

1. Your body is a machine that cannot be thrown into a very foreign and hostile environment such as extreme heat and be expected to perform at it's usual high caliber. No matter how tough you perceive yourself to be, simply dealing with heat and expecting it won't be enough, you must physically adapt to the rigors of heat beforehand.

2. Simplified, sources of heat are:

A. External, from the environment, real (sun, humidity, air temps,) or simulated (heavy layers of clothes that trap heat, blankets, ect...).

B. Internal, generated from physical exertion and output.

C. Both

3. When enduring extreme heat it is most important to stay cool internally:

A. By adding coolant. Drinking lots and lots of cold water and ice, the colder the better.

B. By keeping physical effort to a minimum.

4. External cooling: People naturally sweat to cool off. In extreme heat however, your body might not sweat enough to cool you off, or, the outside environment might be so hot and dry that any perspiration evaporates off your body before it can have any cooling effect on it. Either way, sweat can be simulated by wearing very lightweight or cotton material clothing, long sleeve and preferably covering the legs also, and "continuously" soaking, spraying or saturating the clothing with cold water. The wet clothes against the skin will have the same cooling effect as sweat

5. The combination of keeping cool internally by:

A. drinking lots of cold water,

B. generating as little internal heat as possible by keeping physical exertion to a minimum,

C. and cooling externally by producing outside coolant in the form of artificial sweat should keep most people cool in the hottest environments if a person has these resources available.

6. Humidity: When considering the temperature performing in, take humidity into consideration. From experience I know humidity is a silent killer. It is rare in the West, common in the East. Humidity zaps

strength, dehydrates a person very quickly, and does these things suddenly without warning. A warm humid day is probably more dangerous than a very hot dry day.

In my opinion, the best way to deal with humidity is respect it, even if it doesn't feel that hot, prepare for it by taking it easy and drinking lots and lots. Basically the same as for dry heat, that's why I say, above all else, respect it.



PHOTO: TONY DIZINNO

7. Regardless, to perform in a hot environment at a race like Badwater some heat must be generated internally, and heat must be endured. To do so you must teach your body to adapt to the heat by teaching your body to sweat more, and locate a tolerable medium between physically pushing yourself and yet not overheating internally.

8. Over-dressed heat training.

A. Can be dangerous. Use good judgment and train in a safe environment, particularly one that is safe from traffic.

B. In the heat of the day, either go the whole nine yards and train in many heavy layers right from the start and run very limited mileage to understand how you will personally react to it, or, start with more routine mileage starting with perhaps just a sweatshirt and cold weather cap and add more layers and increase mileage as you adapt.

C. Drink lots and lots of water. Drive to pre determined spots along your route and put cold water and ice out, or always be close to a source of cold water.

D. Pace yourself, it's easy to feel just as strong at the start, aside from feeling heavy, than normal. It "won't" last. Remember to generate as little internal heat as possible and plan on lots of walking.

E. Be prepared for nausea. In my opinion this results from the large amount of water in your stomach. Consider salt, rock salt, S caps to assist with this.

F. Keep up your energy. Just like in normal training, if your run for x amount of time, energy is needed, and even though you might not feel like eating, you must. You might require less energy intake than normal however. Liquid energy is one of the better or "easier" ways to supplement energy in the heat.

G. Keep your wits. The heat is something that can be very overwhelming mentally. If you start to panic or get the slightest bit confused or dizzy, slow down, sit in the shade, recover and cool down. You won't be able to escape the heat in the actual environment however, so if at all possible, cool down by resting and minimizing your effort rather than by taking off any clothing if possible. Tolerating the overwhelming heat can be a big moral victory, but when it comes down to it, safety is your main concern.

H. Make sure others know what your doing, where your training, when to expect you.

I. Know the symptoms of heat exhaustion and heat stroke. Prevention is easier than treatment.

J. The frequency of over dressed training sessions is up to an individual. For me, I opted for about 2 extreme heat sessions a week, and then added one lesser element of heat to each regular training session, by running normally but in the heat of the day, or in the evening wearing a sweatshirt and hat, just always enduring a little more heat than I normally would to build an overall tolerance and acceptance for heat. My most extreme heat sessions consisted of wearing, a cool max t shirt, a sweatshirt, a thick, insulated navy working jacket topped with a rubber non breathable dark green raincoat and cold weather hat. Sweatpants off and on, and towards the end of my preparation gloves as well.

Run / Walks with climb from 1-2 hours average. Maximum heat endured dressed like so, 90 degrees + 100 % humidity for 4 hours, 9 miles with climb. Overall 10-11 "extreme overdressed sessions" over 5-6 week period before Badwater.

Important advice.

Have a good crew who has knowledge of what it takes to keep you going in the heat. My crew was very experienced and kept handing me another water bottle of ice water even before I could finish the one I already had. I probably wouldn't have drunk quite as much had it not been handed to me so often. Have your crew think for you and keep you hydrated.

Personal Race Notes.

Temps at Badwater were lower than normal in 1999 but humidity was high. I stayed well hydrated throughout the race, wore Solar Eclipse sun hat, long sleeved Sun Precautions shirt, shorts. Wore cotton pajama pants some. Very dependable crew misted me down often and I stayed cool and never once suffered with the heat. Successful finish.

Heat wise I suffered much more enduring the heat during my overdressed training than I did during the actual race. In my opinion I was able to perform because I had physically adapted to heat and had mentally learned to accept heat, in addition to the cooling methods we used during the race.

GOD bless.



PHOTO: CHRIS KOSTMAN

Angelika Castenada exiting Furnace Creek - 1999

Heat Training in the Sauna

By Arthur Webb

Four time finisher

There are a number of ways to train for all the heat one will encounter in the Badwater race. Two effective methods are training in the desert recommended by Dr. Ben Jones and simulating the heat conditions by wearing layers of clothing while running as suggested by Stephen Simmons. Definitive articles by these two gentlemen are posted on the badwaterultra.com website. Either method or a combination of both should help one adapt or acclimatize to the heat for a successful trek across Death Valley.

When desert heat is not available and one has problems running in lots of clothing, there is the Tom Crawford/Richard Benyo's bake in the sauna option. I have used their method in a modified format and I firmly believe that it has been instrumental for my three successful journeys across Death Valley.

Most people don't have a sauna so one has to make use of the local fitness center. If money is a problem just let them know about Badwater and the charity you are running for and they will probably make you a deal.

Have no fear for there is still plenty of time to complete a training program. I won't begin mine until the last week in June.

1. The sauna serves two extremely important functions. First, it prepares the body to deal with the blistering heat out in Death Valley. Secondly, but equally as important, it gets the body used to drinking and processing the tremendous amount of liquids you are going to need to survive and finish this incredible race.

2. Heat training in the sauna should take no more than four weeks, usually three weeks is enough. When you have to wear a sweater or light jacket at work or around the house because you feel a little chilled, you are acclimated. It is best to stop sauna training at least three days before the race. You will need the time to super hydrate and the effects of heat adapting will not start wearing off for several weeks.

3. Train every day, although you may have to take a day off to completely hydrate yourself. If there is a steam sauna available use it one day a week. Two years ago, at Badwater, tropical storms lashed the area for several days and it became extremely hot and humid. Fortunately, I had rotated between dry and steam saunas in my training and was ready for anything. It made a huge difference.



PHOTO: CHRIS KOSTVAN

Mike Trevino flying through Death Valley - 2001

4. The goal is to stay in the heat of the sauna for as long as possible. If you attempt any kind of rigorous workout inside the sauna you will have to leave it too soon, which defeats the purpose. So, just be content with simply sitting on the planks or doing a light abdominal workout. Save your harder workout for your daily run. I find it easier to run my daily 10 to 20 miles first and then go lay down in the hot box. Running after a session is extremely difficult. Save this time for rehydrating.

5. Be patient. Begin at low temperatures and gradually work towards hotter sessions. The first day I usually start at 110 degrees and stay as long as possible. Sometimes when it gets overbearing I leave for a few minutes and take a cool shower before going back inside. The first few days are the hardest but as the days go by you will be able to raise the temperatures and stay in longer. By the fourth week, you should be able to handle 30 minutes at 180-degrees. Below, I have added a sample four-week regimen that I have used every year.

6. Drink, drink, drink. It is extremely important to continuously hydrate inside the sauna in order to replace all the liquids you will be profusely sweating out. This will simulate the conditions you will be facing in the desert and after three weeks the body will be able to efficiently process all the liquids it will be going to need.

I usually take in three 2-liter bottles of ice water. Two bottles are for drinking and the third is for rinsing the body; it acts as a coolant for a minute or so, which helps you stay in the sauna longer.

7. Time constraints. You may be pressed for time because of all the training. I suggest you taper on the mileage and hit the sauna or forget the run and just bake in the box.

Everyone has run more than enough at this point in time. Skip a run or two; the heat training is much more important. It will probably do you some good taking a day off. You will benefit more by spending some time getting blasted in the sauna.

8. Recovery. Immediately after the sauna I lay down on a bench in another room in order to let the body cool off. You will sweat again for ten to fifteen minutes while you reenter the normal world. Then a nice long cool shower before continuing to hydrate for the rest of the day. Constant

liquid intake is essential; drinking will enable you to start the next day fully hydrated and you will be able to continue to properly train.

9. Race Day. Pace yourself and make sure you wear a Sun Precautions suit and hat anytime the sun is out. It is much better if you keep the jacket and hat wet as suggested by Stephen Simmons. I have kept mine wet during the heat of the day and it has made an enormous difference. It probably cools you off by 10 or 20 degrees. My crew uses a super-soaker (large squirt gun) and blasts me with cold water every few miles. You will discover that if the suit gets dry it may keep out the ultra violent rays, but it also tends to retain the heat and you start baking inside. It is also best to keep the water from running into your shoes because large ugly blisters will develop. If you get lucky, "The Blister Queen," Denise Jones can help you here.



PHOTO: CHRIS KOSTMAN

Christopher Rampacek - 2001

Art's Heat Training Schedule

Day	Minutes in sauna	Temperature
1	30	110
2	45	110
3	30	120
4	45	120
5	30	130
6	45	130
7	30	140 (steam)
8	45	130
9	30	140
10	30	140 (steam)
11	45	140
12	60	140
13	30	150
14	Rest Re-hydrate	
15	30	150
16	45	150
17	45	150
18	30	160
19	30	160
20	30	140 (steam)
21	Rest Re-hydrate	
22	30	160
23	45	160
24	30	170
25	30	170
26	30	180
27	30	180
28	45	180

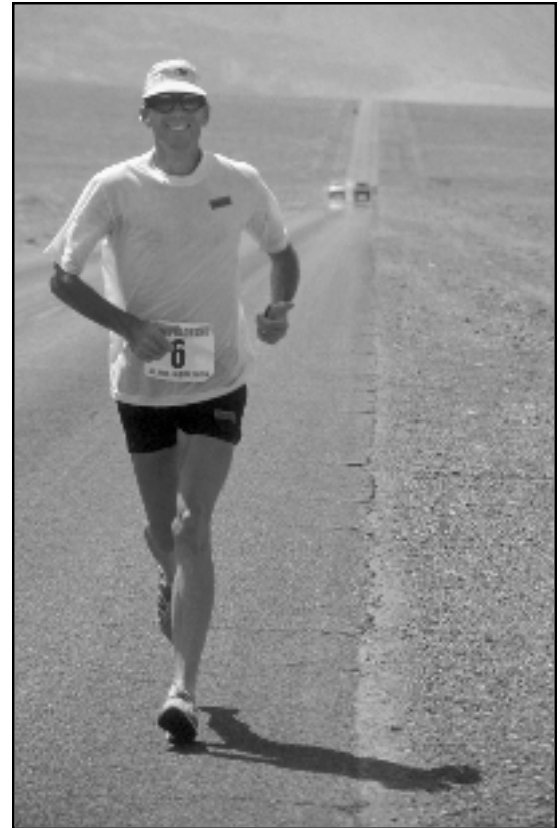


PHOTO: CHRIS KOSTMAN

Eric Clifton - 1999

That's it. Do the best you can and remember even a couple of weeks will help you out. Good Luck. It would be nice to see everyone finish this fantastic race.

The Dangers of Hot Weather

Running: *Dehydration, Heat*

Cramps, Heat Exhaustion, Heatstroke and Hyponatremia

By Claudio Piepenburg

(Originally published by Road Runner Sports)

Running in hot weather can pose dangers to runners. Particularly dangerous is racing in hot, humid summer conditions. Here's how to protect yourself from these five serious (and potentially fatal) conditions.

Dehydration

Dehydration is not limited only to the summer months, although it's probably more likely to occur during that time. Many physicians believe that most people are in a constant state of dehydration. Since coffee, tea, soda and alcohol act as a diuretic, anyone who drinks these fluids on a daily basis, and doesn't drink at least an equal amount of water, will probably be dehydrated. If the person is physically active, the potential for dehydration is even greater.

Working out in hot, humid conditions promotes sweating, which in turn can cause dehydration. Sweating is good for you because it cools your body, but when you lose too much water you become dehydrated. If you're already slightly dehydrated, sweating will only make it worse. It's important to maintain an adequate fluid intake all the time. Don't expect that you can make up for several days of not drinking enough by downing two cups of sports drink before your next long run or race. It's important to keep hydrated all the time. Once you start to feel thirsty, it's too late.

The average (sedentary) person needs a minimum of eight 8-ounce glasses of fluid a day. Runners need more: anywhere from

four to eight quarts of fluid. That translates to at least sixteen 8-ounce glasses daily. Remember that diuretics don't count! Drink water and sports drinks, and if you don't have to worry about calories, fruit drinks or juice.

Two hours before your daily summer workout or a race, you should drink 16 ounces of fluid. Then ten minutes or so before you start to run, drink another one or two cups of water or sports drink. Drinking early and drinking often is the key. During a race you should drink six to twelve ounces of fluid every 15-20 minutes. If the weather is very hot, you may need to drink even more. Training in warm weather, you should drink at least every 35 to 40 minutes. (Remember you will have already had two 8-ounce glasses before you started.) If you're running a race shorter than 30 minutes, you probably won't need any water other than what you drank before the start. The same goes for the last few miles of a longer race. If you're racing or training for longer than an hour, drink sports drinks as opposed to strictly water.

Start drinking immediately after finishing a run, no matter if it was a race or a workout. Minimum is 16 ounces for every 30 minutes you ran. If you tend to sweat a lot, you'll need more. Weigh yourself after you've run. Drink at least 16 ounces of fluid for every pound you lose through sweating.

By monitoring the color of your urine you can tell if you're hydrated. It should be pale yellow or even clear. If it isn't, you need to drink more fluids. It's important that you retain the fluid, so be careful it you're urinating every fifteen or twenty minutes. To restore your fluid balance, eat something salty (a bag of pretzels, salted nuts, crackers or potato chips), then drink a sports drink. The salt will make you thirstier, so you'll take in even more fluid and urine production will decrease.

Heat Cramps

Have you ever seen a runner bent over at the side of the road massaging their calves during a race? Chances are that he or she had heat cramps. Heat cramps are very painful (envision someone stabbing a knife deep into your muscles!) and rarely "work themselves out". The cramps occur because you've lost minerals through sweating and dehydration. Once you've reached the point of heat cramps, it's too late to try to replace fluids on the run. To make the cramps go away you should:

- Stop running
- Drink fluids immediately. The fluids should include sports drinks as well as water
- Massage the muscles once the pain begins to subside
- Cool your body with wet towels
- Get out of the sun

Heat Exhaustion

Heat exhaustion is a very serious condition that can lead to heatstroke. The symptoms of heat exhaustion are:

- Dizziness
- "Goose bumps" (particularly on the torso and arms)
- Nausea (sometimes accompanied by vomiting)
- Moderate to severe headache
- Weak legs
- Lack of coordination
- Rapid pulse
- Heavy sweating often accompanied by moist and cold skin
- Muscle cramping

If you experience any of these symptoms you must:

- Stop running immediately
- Get medical attention
- Drink large amounts of fluids, including sports drinks
- Get out of the sun
- Lie down and elevate your feet above your heart
- Loosen your clothing

Heatstroke

Heatstroke can be fatal. Unfortunately runners will sometimes ignore the symptoms of heat exhaustion (particularly in races longer than 10K) and will continue to push themselves until they're nearing a total thermoregulatory breakdown. The symptoms of heatstroke are very similar to those of heat exhaustion, but rapidly progress to:

- Disorientation
- Weakness in the legs to the point that the runner may fall
- Strange behavior (including flailing with the arms and shoving)
- "Fuzzy" thinking
- Rapid pulse
- Cessation of sweating and hot/dry skin
- Body temperature that may reach 104 degrees or higher
- Lack of consciousness
Convulsions or seizures
- Coma

Someone suffering from heatstroke needs immediate medical attention. They should be moved out of the sun, cooled by either rubbing their body with ice or immersing them in cold water and given fluids intravenously.

Hyponatremia

Within the last few years the condition known as hyponatremia has begun to attract the attention of sports medicine physicians, exercise physiologists, and the medical directors at some of the larger marathons around the country. Hyponatremia has been called water intoxication because of the symptoms it produces. According to Dr. Tim Noakes, Professor of Exercise & Sports Science Director at the University of Cape Town, "...a person with hyponatremia looks like he or she is mildly drunk. They can't concentrate normally...they forget what you were talking about and start to concentrate elsewhere."

Hyponatremia occurs when the body becomes dangerously low in sodium. It's caused when you literally take in too much water. Although scientists have known about it for a long time, it has only been in the last few years as more runners have been competing in marathons that it has become a concern. According to Dr. Noakes, fluid has to be ingested at high levels for several hours for hyponatremia to occur. He suggests that a runner would have to be drinking water regularly for at least four to six hours to develop the condition. So runners taking four to six hours or more to run a marathon are at particular risk.

Unfortunately, symptoms of hyponatremia tend to mimic those of severe dehydration and/or heat exhaustion. By giving the athlete more water to drink the hyponatremia becomes worse, as more and more sodium is flushed out of the system. If a runner with hyponatremia is given fluids intravenously, they can suffer a fatal reaction. Dr. Noakes and other sports medicine professionals recommend that physicians and other medical personnel at road races be alert for the signs of hyponatremia. One of the earliest symptoms is a craving for salty food.

Although hyponatremia is rare, it's wise to be aware that it can occur, particularly if you're running a marathon in unusually hot weather. Hyponatremia serves as a reminder that water is good, but don't forget sports drinks, which replenish your body with the sodium, potassium and other trace minerals you lose through sweat. It's worth repeating: if you're going to be running (or racing) for longer than an hour, you should be drinking a sports drink as well as water.

About the author:

Claudia Piepenburg has been running for 21 years and is the current editor for Peak Run Performance. She holds or has held state age-group records in Michigan,

North Carolina, Florida, Tennessee and Virginia. In 1990, she was ranked 18th fastest masters woman in the world and 8th fastest masters woman in the U.S. in 1990 and 1991. She competed in the 1988 Olympic Marathon Trials, was 20th woman overall in the 1987 Boston Marathon and women's winner of the 1986 Virginia Beach Marathon. If you have questions or comments for Claudia, she can be reached at cpiepe@roadrunnersports.com.



PHOTO: DAN DOMINY

Anne Langstaff on the approach to Mt. Whitney - 2000

The Death Valley Cup

The Death Valley Cup recognizes male and female athletes who complete both the Badwater Ultramarathon 135 Mile Running Race and the Furnace Creek 508 Mile Bicycle Race in the same calendar year. This is a form of recognition for those athletes who complete both races in the same year, and also an actual plaque that is awarded each time an athlete breaks the current overall record for either the men's or women's divisions. Thus, there are, at any given moment, two Death Valley Cup Record Holders, as well as an ongoing, slowly increasing list of Death Valley Cup Finishers. To earn this recognition is a very significant achievement in endurance sports and especially for those athletes who have come to know and love Death Valley and its environs.



PHOTO: TONY DIZINNO

Marshall Ulrich - 2000

Current Death Valley Cup Record Holders

Kaname Sakurai, 36, Nagoya, Japan
 2000 Badwater, 27:52:14, 3rd place
 2000 Furnace Creek, 32:31:56, 2nd place
 =60:24:10 total time*

Angelika Castaneda, 56, San Diego, CA
 1999 Badwater, 36:58, 1st place
 1999 Furnace Creek, 43:46:40, 3rd place
 =80:44:40 total time*

(*To receive the Death Valley Cup plaque, these combined record times must be broken.)

Death Valley Cup Finishers

Marshall Ulrich, Ft. Morgan, CO
 1996 Badwater, 33:01, 1st place
 1996 Furnace Creek, 38:32:45, 16th place
 =71:33:45 total time

Charlie Liskey, Somis, CA
 1996 Badwater, 58:26, 14th place
 1996 Furnace Creek, 39:32:08, 17th place
 =97:58:08 total time

Del Scharffenberg, Portland, OR
 1997 Badwater, 48:16, 13th place
 1997 Furnace Creek, 42:15:26, 10th place
 =90:31:26 total time

For information on Furnace Creek 508, visit <http://www.the508.com>.



PHOTO: TONY DIZINNO

Kaname Sakurai - 2000

Official Rules and Regulations

General Race Rules

1. There are three starting times for the 2002 Badwater Ultramarathon (6am, 8am, and 10am on July 23, 2002), but all racers in all groups are competing in the same race. Runners may attend only their assigned start time. Runners must check in at the start line, ready to race, 30 minutes prior to their start time. Starting Groups are assigned by the race director and are non-transferable. Split times will be collated throughout the race to maintain overall standings. There are only two divisions: men's and women's. The racer to arrive at the finish line in each division with the lowest overall time, based on their starting time, will be considered the winner.

2. The official race bib/jersey/number and bracelet must be worn unmodified and visible at all times while on the course.

3. The clock does not stop for any reason until the course officially closes 60 hours after each official start time.



PHOTO: CHRIS KOSTIVAN

Steven Silver and crewmember - 2001

4. Running must always be on the far left side of the road or off the left side of the road, facing traffic (pacers, too).

5. Racers must make their presence known at all Time Stations located in fixed locations along the route. Runner times in and out of

the Time Station will be recorded. Racer locations, time splits, and places will only be revealed at Time Stations.

6. The race ends at the Mt. Whitney Portals. If you choose to hike to the summit, please remove any official race logos. Be sure to have the appropriate permits from the National Park Service.

7. Racers, crew, and staff must not litter, mar, or pollute the landscape or environment.

8. All racers, crew and staff must display courtesy, good taste, decorum, and sportsmanship at all times. Nudity is specifically not allowed.

Legal and Bureaucratic Issues

1. All racers must follow and complete the entire application and entry process, filling out all forms and paying all necessary fees.

2. All racers must sign the Entrant Contract.

3. All racers and crew must sign the Liability Release / Agreement to Terms and Conditions.

4. All racers and crew must sign the Release of Name and Likeness form.

5. All race vehicles must meet the minimum requirements of property damage and personal injury liability automobile insurance for the state of California. All vehicle drivers must be fully licensed.

6. All racers and at least one of their crew members must attend all of the Pre-Race Meeting. Those racers who do not attend the meeting will not be allowed to participate. No exceptions.

7. All racers must be willing to submit to a drug urine test before, during, or after the race. If any banned substances are detected, the racer will be disqualified from competition and the final standings of the race itself.

8. No TV, film, or video crew, person, producer, director or other broadcast media representative may accompany or cover any racer or the race itself without the specific written permission of the Race Director. All film crews must sign a Non-Exclusive Licensing Agreement and pay a Rights Fee. Additionally, Death Valley National Park will require payment of a filming fee and signature of a filming agreement.

9. All racers and crew must pay the Death Valley National Park Entrance Fee of \$5 per person. Proof must be brought to Runner Check-In on July 22 or racers will have to pay the entrance fees for the entire group at that time.

10. All entrants must bring one U.S. dollar in a sealed envelope to the pre-race meeting.

Support Crew

1. Each racer must have a support crew comprised of at least one four-wheeled motor vehicle and two crew members at all times. Each racer must have his or her own support crew and vehicle; crew and support vehicles may not be shared, except informally in the spirit of the event, i.e., crews may lend assistance to other racers or crews.

2. Runners must progress under their own power without drafting, helping, or any other type of physical assistance. Crewmembers may not carry and umbrella or shade cover for a runner.

3. Runners may not be accompanied by more than one pacer, either on foot or bicycle, at any given time. Additional crew members that are handing off supplies to the runner and/or pacer must be off the roadway at all times (i.e. left of the white line on the shoulder).

4. Runners must not run abreast with other runners or with pacers on the roadway. All running must be single-file on the roadway.

If runners or pacers want to run next to one another, they must be OFF the roadway, i.e. left of the white line.

5. Crew members may not use illegal drugs, stimulants, or dope, as well as alcohol of any kind, during the race or at any race events or activities.

Support Vehicles

1. The support vehicle may not be wide than 78" in width, as stated in the manufacturer specifications. Small Cars, Minivans, and SUVs are recommended. All motorhomes, RVs, oversize SUVs, vans, and trucks, or other types of oversize vehicles are strongly discouraged, even as a secondary support vehicle. Also, if a racer has only one support vehicle, it may not be wider than 78".

2. All support vehicles must have their headlights on whenever the engine is running, 24 hours a day.



PHOTO: TONY DEZINNO

3. All race vehicles must have highly visible signage on the back of the vehicle stating "CAUTION RUNNERS ON ROAD." This type of sign can be made, for example, using yellow, white, or pink adhesive shelf paper with at least 6 inch letters. Magnetic, reflective, professionally made signs for this purpose can be made to order by a local sign shop.

4. All support vehicles must have their racer's name and race number easily visible on all four sides. This type of sign can be

made, for example, using yellow, white, or pink adhesive shelf paper with at least 6 inch letters.

5. Vehicle windows may not be blocked or obstructed with any signage.

6. Only one support vehicle is allowed for each racer at the Start Line before the race and between the Start Line and Furnace Creek during the race. This support vehicle may not be an RV or motorhome. No RVs or motorhomes are allowed between the Start Line and Furnace Creek.

7. No RVs or motorhomes are allowed between the Lone Pine and the Finish.

8. Vehicles must "leapfrog" the runner at all times. Attempt to make each "leapfrog" at least one mile or more in length. Racers may not be "shadowed" or "caravanned." Driving may never be at the speed of any racer. Driving must be done at the speed of traffic, not slowing down to encourage, talk to, or lend assistance to any racer while moving. All assistance must be provided by pedestrian crew members - handing off of supplies from the vehicle is not allowed.

9. Vehicles must be parked completely off the road surface whenever they are stopped **(with all four tires right of the white line)**. Many areas of the route have very little shoulder for parking so care must be taken in choosing stopping places. When stopping/parking, vehicles may not stop on the left side of the road. All stopping/parking must be on the right side of the road.

10. All vehicles must obey the vehicle code laws of California at all times.

Safety and Medical Issues

1. Remember, at all times and in all situations, safety is the most important issue. This means safety for racers, crew, staff, and the general public.

2. I.V.s (intravenous fluids) are not permitted during the race. If a racer receives an I.V. during the race, then that racer is disqualified and may not complete the course officially.

3. Racers and crew members/pacers must wear reflective material facing in all four directions, as well as blinking LED lights facing front and rear, at night. Racers and crew members are encouraged to wear reflective material during the day as well.

4. Racers are responsible for both their own and their crew's actions and crews are responsible for both their own and their racer's actions.



PHOTO: TONY DIZINNO

5. Always look and listen both ways before crossing the highways. Remember that drivers will not expect to encounter a racer or parked vehicle out on the course. Remember you are on public roads. Racers should not cross over the highway more than necessary; crew should cross the highway carefully to bring assistance to their racer.

6. All entrants and crew must study "Medical Risks in the Badwater Ultramarathon" and "The Dangers of Hot Weather Running".

Leaving the Course or Withdrawing

1. Every inch of the course must be traveled by each racer. In the event of a routing error, e.g., wrong turn, the competitor may be driven back to the exact original spot where he/she left the course and continue running

from that location. There will be no allowance made for lost time or miles run in the wrong direction.

2. If a racer needs to leave the course, his/her crew must note the exact location with a numbered stake in the ground. This ground must be visible from the road in both directions. The racer must then resume the race from the same place that he/she left it. The numbered stakes will be provided to all runners at the pre-race meeting.



3. If a racer withdraws, he/she or his/her crew must contact Race Headquarters or a Time Station immediately. Reason for withdrawal, time of withdrawal, and miles completed must be stated. All racers and crew who drop are encouraged to come to the finish line and both post-race events to greet and celebrate with their fellow racers and crew.

4. All Emergency Evacuation costs for participants or crews will be borne by that person or their heirs. The race organizers are in no way liable or responsible for emergency evacuation.

Awards

1. All racers who begin the event will receive a Badwater Ultramarathon race t-shirt and Badwater Ultramarathon Race Magazine.

2. All racers who officially complete the event within 60 hours will receive a commemorative certificate. Certificates will be mailed after the race.

3. All racers who officially complete the course within 48 hours will receive a commemorative Badwater Ultramarathon buckle. Buckles will be mailed after the race.

Rule Enforcement and Penalties

1. Race rules are designed to provide a safe and fair experience for everyone involved.

2. Major rule infractions by racers or their crew, especially those regarding "cheating," will result in immediate disqualification of the racer.

3. Other lesser offenses will result in the following cumulative time penalties:

First Penalty: One hour

Second Penalty: Disqualification

4. Time penalties are imposed by stopping at the final Time Station in Lone Pine to serve his/her time. The race and clock will continue while the penalized racer waits out his/her penalty time. A Race Official will be present to oversee this process.

5. The Race Director has the authority to overrule any regulation or invent a new rule based on extenuating circumstances. The Race Director has ultimate authority in regards to all rules and their enforcement. There is no "appeals committee" or "appeals process."

Finally

1. Have fun and keep smiling!

Course Description

© 1996 Matthew Frederick

Badwater, Death Valley

The race begins here adjacent to a pool of saltwater located at the lowest place in the United States. Runners must check in 30 minutes before their start time.

Furnace Creek Ranch, Mile 17.4

The first oasis in our journey. A gas station, small general store, motel, campsites, and ice machine await us there.

Stove Pipe Wells, Mile 41.9

A small market, gas station, restaurant and motel. This is not open 24 hours.

Townes Pass (4956'), Mile 58.7

Long ascent, then long descent, followed by approx. 12 long straight miles. Steep & narrow road with limited opportunities to park. Support vehicles, crews, and runners must be cautious and extra aware of the traffic.

Panamint Springs Resort, Mile 72.3

Restaurant and motel with limited hours. Long, steep climb ahead. Steep & narrow road with limited opportunities to park.

Support vehicles, crews, and runners must be cautious and extra aware of the traffic.

Father Crowley's Turnout, Mile 80.2

Road continues to rise to 5000' over rolling hills to summit, then descends into Owen's Valley.

Keeler, Mile 107.8

A small mining town with no facilities.

Lone Pine, Whitney Portal Road, Mile 122.2

Lone Pine offers the weary runner/crew fast food, pizza, restaurants, motels, gas stations, grocery stores, etc. Restock here for the climb to the portals. Turn left onto the Whitney Portal Road to begin the final leg, the longest & steepest climb of the race. Temperatures will steadily decrease. Be prepared with extra layers of clothing and rain gear the final few miles. Be sure your support vehicle is completely off of the road and that you do not block traffic.

Mt. Whitney Trailhead, (8360'), Mile 135

Congratulations! You have finished the most extreme ultra in the world! A small diner/shop are open daylight hours. There is also a stocked fishing pond and a campground.



Rick Nawrocki and Race Director Chris Kostman at finish line - 2001

PHOTO: LEN BERTAIN

Badwater Ultramarathon Official Race Route

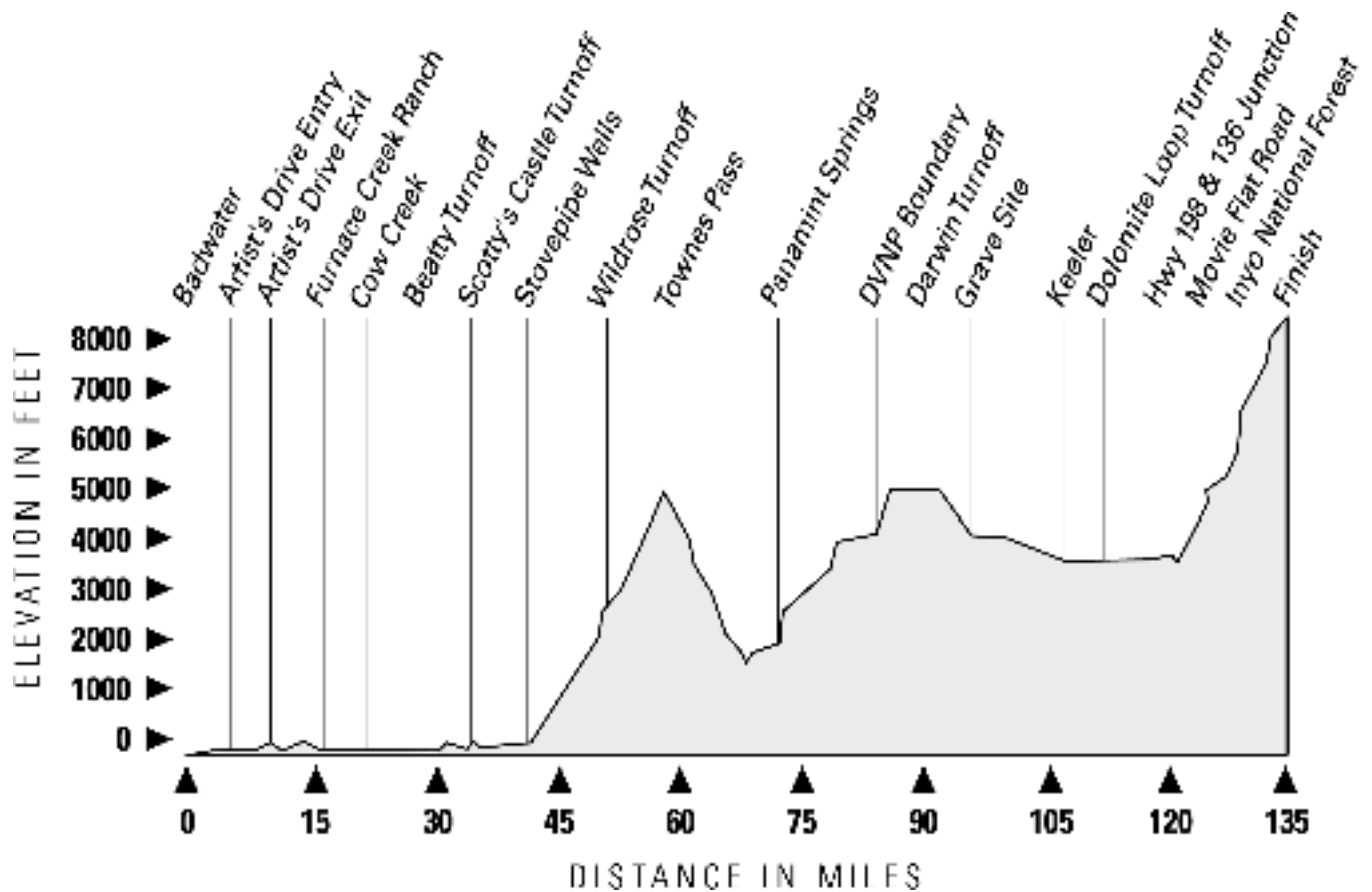
<i>Landmark</i>	<i>Mile</i>	<i>Elev.</i>	
Badwater	0	-282	
Telescope Peak Sign on L.	1.8	-200	
Wide Shoulder on R.	3.1	-200	
Natural Bridge on R.	3.5	-170	
Devil's Golf Course on L.	5.5	-165	
Artist's Drive entry on R.	7.9	-165	
West Side Road on L.	10.5		
Artist's Drive exit on R.	11.6	-70	
Mushroom Rock on R.	12.9	-170	
Golden Canyon on R.	14.4	-165	
Hwy 190 & 178 – Go Left	16.4	0	
Furnace Creek Ranch on L.	17.4	-165	-First Time Station on Left after entrance
Chevron Gas and ice on L.	17.6	-165	
Visitor's Center on L.	17.7	-170	
Harmony Borax Works on L.	19.0	-170	
Cow Creek on R.	20.7	-170	
<i>1st Marathon</i>	<i>26.2</i>	<i>-170</i>	
Beatty, NV turnoff on R.	28.3	-165	
Salt Creek turnoff on L.	30.7	-165	
Sea Level Sign on L.	31.9	0	
Scotty's Castle turnoff on R.	34.7	-130	
Sea Level Sign on L.	35.2	0	
Sand Dunes turnoff on R.	35.8	0	
Devil's Cornfield sign on R.	36.1	-80	
Sand Dunes on R.	39.9	0	
Stovepipe Wells Village	41.9	0	-Second Time Station on Right before Store
Mosaic Canyon turnoff on L.	42.1	5	
1000' elevation sign	46.6	1000	
2000' elevation sign	50.5	2000	
Wild Rose turnoff on L.	51.0	2500	
<i>2nd Marathon</i>	<i>52.4</i>	<i>2800</i>	
3000' elevation sign on L	53.3	3000	
4000' elevation sign on L.	55.7	4000	
2nd Radiator Water Tank on R.	58.5	4900	
Townes Pass summit	58.7	4965	
4000' elevation sign on R.	61.5	4000	
Vista Point (view of Whitney)	62.2	3500	
3000' elevation sign on L.	63.8	3000	
2000' elevation sign on L.	66.1	2000	
Adopt-a-Highway sign on R	67.7	1800	
Panamint lake bed, east edge	68.1	1640	
Panamint lake bed, west edge	69.1	1640	
Trona turnoff on L.	69.8	1750	
Panamint Springs Resort	72.3	1970	-Third Time Station on Left at Resort

2000' elevation sign on L.	72.9	2000	
Darwin Falls turnoff	73.3	2500	-Dangerous, narrow area! - miles 74 to 81*
3000' elevation sign on L.	75.8	3000	
<i>3rd Marathon</i>	<i>78.6</i>	<i>3400</i>	
4000' elevation sign on L.	80.2	4000	
Father Crowley's Point on R.	80.2	4000	
DVNP Park Boundary	84.9	4200	
Saline Valley turnoff on R.	86.0	4800	
5000' elevation sign	87.0	5000	
Darwin turnoff on L	90.1	5050	-Fourth Time Station on Left at turnoff
5000' elevation sign on L.	92.4	5000	
Grave Site on R.	96.3	4100	
27.5 mile post marker	100.0	4050	
4000' elevation sign on L.	101.6	4000	
Hwy 136 & 190 – go straight	102.9	3935	
<i>4th Marathon</i>	<i>104.8</i>	<i>3800</i>	
Keeler	107.8	3610	
Adopt-a-Highway sign on R.	108.5	3605	
Dolomite loop turnoff on R.	112.6	3600	
Dolomite loop turnoff on R.	116.9	3610	
Owen's River	117.7	3610	
Hwy 190 & 395 – go Right	120.3	3695	
Dow Villa Hotel on Right	122.3	3610	-Fifth Time Station on Right at Dow Villa
Portal Road light – go Left	122.4	3610	
Tuttle Creek turnoff on L.	122.9	3770	
LA Aqueduct	123.0	3855	
Lone Pine Creek	124.1	4200	
Movie Flat Road on R.	125.1	4590	
Lone Pine Creek	125.3	4800	
Horseshoe Meadow on L.	125.5	5000	
Cuffe Ranch turnoff on R.	126.7	5100	
Olivas Ranch turnoff on L.	128.0	5300	
Lone Pine Campground on L.	129.0	5700	-Dangerous, narrow area! - miles 129 -135*
Lone Pine Creek	129.2	6000	
Inyo Nat. Forest sign on R.	129.5	6400	
Large pullout on R.	130.8	6890	
<i>5th Marathon</i>	<i>131.0</i>	<i>7000</i>	
Switchback to left	131.7	7215	
Vista Point	132.4	7400	
"Campsites 39-44" sign on R	133.3	7700	
Meysan Lakes trailhead on L.	133.5	8035	
Family Campsites	133.7	8100	
Overflow Parking	134.3	8200	
Finish	134.4	8360	

Official distance is 135.0 miles. Remember all car odometers have error. Distances above are accurate in a relative sense, but you may find variation in the overall distance, as we did when creating the above routesheet

***No slowing down or stopping except in proper pullouts**

Course Elevation Chart



Rough Course Profile Stats

69 Flat Miles

Badwater to Stovepipe: 41
 Panamint floor: 2
 Darwin flats: 4
 Owens Valley to Lone Pine: 22

46 Uphill Miles

Stovepipe to Townes: 18
 Panamint grade (west): 15
 Lone Pine to Whitney Portals: 13

20 Downhill Miles

Townes Pass to Panamint Valley: 8
 Darwin to Owens Valley: 12

Race Roster

6AM Start

2	F	Angela	Brunson	31	Los Angeles	CA	USA	Rookie
20	M	Jack	Denness	67	Rochester	Kent	UK	Veteran
21	M	Michael	Doppelmayr	40	Hallein	-	Austria	Rookie
22	M	Leon J.	Draxler	60	Sumner	WA	USA	Veteran
3	F	Barbara	Elia	57	Modesto	CA	USA	Veteran
4	F	Shannon	Farar-Griefer	41	Calabasas	CA	USA	Veteran
23	M	Winfried	Friedel	39	Markt Erlbach	-	Germany	Rookie
5	F	Anita Marie	Fromm	31	Colorado Springs	CO	USA	Rookie
25	M	Mike	Henebry	58	Cypress	CA	USA	Rookie
6	F	Debra	Horn	43	Shaker Heights	OH	USA	Rookie
26	M	Mark	Johnson	38	Mountain View	CA	USA	Rookie
13	M	W. Curt	Maples	38	Oxnard	CA	USA	Veteran
8	F	Kari	Marchant	44	Bishop	CA	USA	Rookie
27	M	Stephan	Matsuda	46	West Hills	CA	USA	Rookie
28	M	Derek	McCarrick	67	Isle of Sheppey	Kent	UK	Rookie
9	F	Linda	McFadden	39	Modesto	CA	USA	Rookie
10	F	Vilma	Mejia	50	Glendale	CA	USA	Veteran
24	M	Jean Jacques	Merienne	49	Chamiers	-	France	Veteran
11	F	Toni C.	Miller	50	Redding	CA	USA	Rookie
12	F	Ernie	Rambo	45	Las Vegas	NV	USA	Rookie
14	F	Pam	Reed	41	Tucson	AZ	USA	Rookie
15	F	Jody-Lynn	Reicher	39	Midland Park	NJ	USA	Rookie
16	F	Tia B.	Rosen	45	Denver	CO	USA	Rookie
29	M	Jan	Ryerse	56	St. Louis	MO	USA	Rookie
17	F	Margaret J.	Schlundt	49	Millersville	MD	USA	Veteran
18	F	Monica	Scholz	35	Jerseyville	Ontario	Canada	Rookie
7	F	Lisa R.	Smith	41	Victor	ID	USA	Veteran
19	F	Blaise	Supler	41	Washington	DC	USA	Rookie
1	M	Marshall	Ulrich	51	Brighton	CO	USA	Veteran
30	M	Scott	Weber	49	Frisco	CO	USA	Veteran

8 AM Start

31	M	Jay	Anderson	46	Buena Park	CA	USA	Rookie
32	M	Vito	Bialla	53	Sausalito	CA	USA	Rookie
33	M	George	Biondic	49	Newmarket	Ontario	Canada	Rookie
34	M	Calvin Kip	Buck	50	Beaverton	OR	USA	Veteran
35	M	Ruben	Cantu	59	Santee	CA	USA	Veteran
36	M	Doug	Croxall	33	Venice	CA	USA	Veteran
37	M	Lionel	Dyck	58	Harare	-	Zimbabwe	Rookie
38	M	Terry	Graves Jr.	35	Baroda	MI	USA	Rookie
39	M	Ronald	Grimes	55	New Castle	IN	USA	Rookie
40	M	Michael	Haviland	60	Fillmore	CA	USA	Rookie
41	M	Jason	Hodde	32	West Lafayette	IN	USA	Veteran
42	M	Colin	Irving	37	Colwyn Heights	Conwy	UK	Rookie
43	M	David	Jackson	43	Lexington	KY	USA	Veteran
44	M	Karl W.	Keltner	40	Overland Park	KS	USA	Veteran
45	M	Randy	Klassen	49	Ridgecrest	CA	USA	Rookie
46	M	David	Lazenby	32	Walkington	East Yorkshire	UK	Rookie
47	M	Don	Lundell	40	Boulder Creek	CA	USA	Rookie
48	M	Jack	Menard	52	Denver	CO	USA	Rookie
49	M	Dale	Nagel	43	Avondale	AZ	USA	Rookie
50	M	Rick	Nawrocki	47	Torrance	CA	USA	Veteran
51	M	Ian	Parker	51	Irvine	CA	USA	Rookie
52	M	Keith Alan	Peterson	49	Portland	OR	USA	Veteran
53	M	Bo	Pheffer	50	New Castle	IN	USA	Rookie
54	M	John JR	Radich	47	Monrovia	CA	USA	Veteran
55	M	Dave	Remington	61	Spokane	WA	USA	Rookie
56	M	Reg	Richard	51	Pleasant Plain	OH	USA	Veteran
57	M	Leon	Rothstein	45	Boise	ID	USA	Rookie
58	M	Bob	Sitler	43	Lynchburg	VA	USA	Rookie
59	M	Mike	Smith	44	Fishers	IN	USA	Rookie
60	M	James L.	Smith	37	Grand Rapids	MI	USA	Veteran

By Bib

1	Ulrich
2	Brunson
3	Elia
4	Farar-Griefer
5	Fromm
6	Horn
7	Smith
8	Marchant
9	McFadden
10	Mejia
11	Miller
12	Rambo
13	Maples
14	Reed
15	Reicher
16	Rosen
17	Schlundt
18	Scholz
19	Supler
20	Denness
21	Doppelmayr
22	Draxler
23	Friedel
24	Merienne
25	Henebry
26	Johnson
27	Matsuda
28	McCarrick
29	Ryerse
30	Weber
31	Anderson
32	Bialla
33	Biondic
34	Buck
35	Cantu
36	Croxall
37	Dyck
38	Graves Jr.
39	Grimes
40	Haviland
41	Hodde
42	Irving
43	Jackson

10 AM Start

61	M	Steve	Burrows	51	Orillia	Ontario	Canada	Rookie
62	M	Sergio	Cordeiro	47	Brasilia	DF	Brazil	Rookie
63	M	Wendell	Doman	42	Concord	CA	USA	Rookie
64	M	Colin Meredydd	Evans	31	Galway	Ireland	UK	Veteran
65	M	Dr. Holger	Finkernagel	58	Bad Berleburg	-	Germany	Veteran
66	M	Eberhard	Frixe	52	Meine	Niedersachsen	Germany	Veteran
67	M	Chris	Frost	51	Malibu	CA	USA	Rookie
68	M	Dave	Hannaford	51	San Anselmo	CA	USA	Rookie
69	M	Achim	Heukemes	50	Gaefenberg	Bayern	Germany	Rookie
70	M	Jürgen	Hofmann	50	Eisenberg	Rheinland-Pfalz	Germany	Veteran
71	M	Mick	Justin	54	Nisswa	MN	USA	Veteran
72	M	Bob	Lapanja	48	El Dorado Hills	CA	USA	Veteran
73	M	Manoel de Jesus	Mendes	42	Brasilia	-	Brazil	Rookie
74	M	Josh	Miller	35	Anthem	AZ	USA	Rookie
75	M	Greg	Minter	41	Los Angeles	CA	USA	Veteran
76	M	Scott	Morgan	44	San Diego	CA	USA	Rookie
78	M	Peter	Mueller	39	Kloten	Zurich	Switzerland	Rookie
77	M	John	Quinn	44	Boulder	CO	USA	Veteran
79	M	Dr. Christopher	Rampacek	50	Houston	TX	USA	Veteran
80	M	Clive	Saffery	47	Quarry Bay	Hong Kong	UK	Veteran
81	M	Steven R.	Silver	53	El Paso	TX	USA	Veteran
82	M	Paul	Stone	40	Bullard	TX	USA	Veteran
83	M	Charlie	Vincent	42	Monaco	-	UK	Veteran
84	M	Arthur	Webb	60	Santa Rosa	CA	USA	Veteran
85	M	Uli	Weber	53	Würgau	-	Germany	Veteran
86	M	Darren	Worts	31	Chatham	NJ	USA	Rookie

By Bib #
continued

44	Keltner
45	Klassen
46	Lazenby
47	Lundell
48	Menard
49	Nagel
50	Nawrocki
51	Parker
52	Peterson
53	Pheffer
54	Radich
55	Remington
56	Richard
57	Rothstein
58	Sitler
59	Smith
60	Smith
61	Burrows
62	Cordeiro
63	Doman
64	Evans
65	Finkernagel
66	Frixe
67	Frost
68	Hannaford
69	Heukemes
70	Hofmann
71	Justin
72	Lapanja
73	Mendes
74	Miller
75	Minter
76	Morgan
77	Quinn
78	Mueller
79	Rampacek
80	Saffery
81	Silver
82	Stone
83	Vincent
84	Webb
85	Weber
86	Worts

Entrant Nationality

Austria	1
Brazil	2
Canada	3
France	1
Germany	6
Switzerland	1
United Kingdom	7
USA	62
Zimbabwe	1

Entrant State (USA)

AZ	3
CA	28
CO	6
DC	1
ID	2
IN	4
KS	1
KY	1
MD	1
MI	2
MN	1
MO	1
NJ	2
NV	1
OH	2
OR	2
TX	3
VA	1
WA	2