

Thundering Herd Volleyball leaps to new heights

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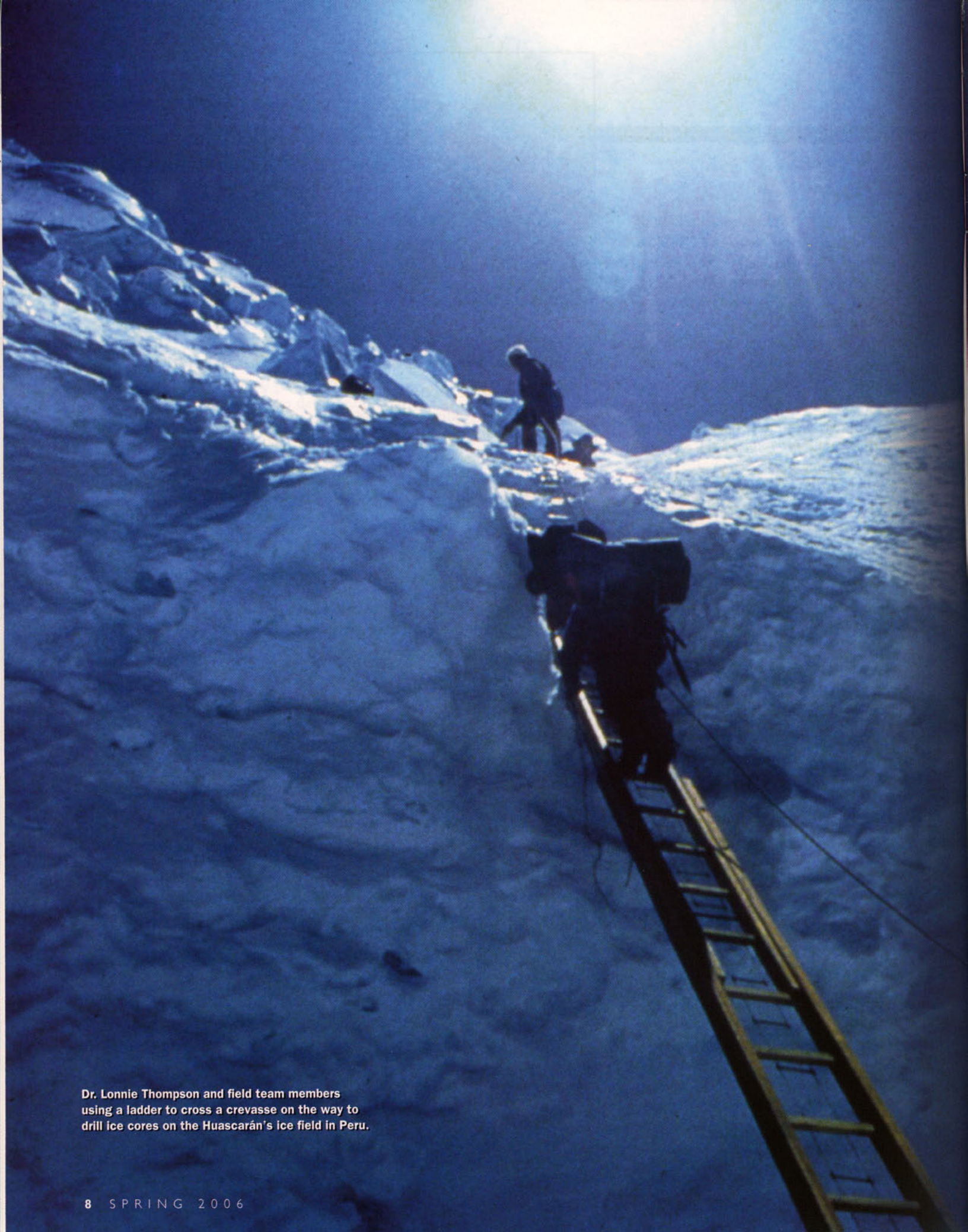
THE ICE HUNTERS

Drs. Lonnie Thompson and Ellen Mosley-Thompson are two Marshall grads who are world-renowned for their pioneering research on global warming.



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Dr. Lonnie Thompson and field team members using a ladder to cross a crevasse on the way to drill ice cores on the Huascarán's ice field in Peru.

ICE HUNTERS

Meet Dr. Lonnie Thompson and his wife Dr. Ellen Mosley-Thompson, two world-renowned Marshall alumni who traverse the far reaches of the earth as part of their pioneering research on global warming.

Article by Marla Brannan

August 1, 1993. Nevado Huascarán, Andes Mountains, Peru. Twenty thousand feet above sea level. A storm the likes of which experienced mountaineers have never seen breaks across the peaks packing 80 mile an hour winds and lasting three days. A group of researchers, ice hunters, huddle in their tents through the nights, three nights out of 53 spent at this elevation.

On night two the nearly disastrous happens: the winds rip a tent's anchor lines clean off. The tent and everything in it – researcher, precious notes and equipment – slide down the mountain toward a 1,000 meter cliff until a comrade chases it down and secures it with an ice axe straight through the tent floor. But, two Italian mountaineers, experienced climbers, weren't so fortunate. The winds of this storm blew them off Huascarán's North Peak and they fell 2,000 meters to their deaths.

Mountaineering is, mildly put, a hard day's work – but Dr. Lonnie G. Thompson, a Distinguished University Professor at The Ohio State University and graduate of Marshall, loves it despite almost sliding off Huascarán in his tent. The dangers he has faced over the years are just part of the job.



"No scientist has taken bigger risks to track ancient weather patterns and help us understand the anomaly of current climate trends," notes former Vice President Al Gore.

So why does he do it? *Because of the ice.*

Thompson is a glaciologist, a researcher who studies the world's glaciers. In this case, those glaciers, ice caps and ice fields are in the tropics where 50 percent of earth's surface area lies and 70 percent of the world's 6.5 billion people currently live. He has made 50 expeditions in 15 countries up mountains in these latitudes, at times utilizing as many as 92 porters and more than 40 yaks to haul six tons of equipment and supplies – *all in the pursuit of ice.*

The ice Thompson and his team retrieve comes from cores drilled at sites in places like the Andes of Peru, the Himalayas and Mount Kilimanjaro in Tanzania. It is recovered using electro-mechanical and thermal drills powered by 60 individual solar panels.

The solar-powered drill was a product of necessity. "Often reaching our drill sites involves traveling for days on horseback, and then climbing the glacier sometimes includes negotiating crevasses using ladders. A conventional generator

cannot be transported in this environment," says Thompson. So his team, based at OSU, decided to develop a new drill that would harness something already on the mountain: sunlight.

"The assembled panels produce four kilowatts of power to drive the drills. There is no noise and no pollution. The downside is you can only drill during the day."

This is how Thompson explains the process: "Ice is removed from the drill and placed into plastic sleeves, then sealed and placed into tubes. The cores range from 1 to 1.6 meters (3.3 to 5.2 feet) in length and 11 centimeters (or 4 inches) in diameter. They are stored in chambers dug into the snow surface while drilling is taking place. The individual tubes are then sealed in insulated boxes, 6 tubes to a box, and moved by sled to the edge of the glacier. For instance, when we worked in the Himalayas, they were carried by yaks to the valley below where the vehicles were located. The trucks were then driven day and night across Tibet to the nearest large freezer in Lhasa. From there they were air cargoed to Beijing, where they cleared Chinese customs and were subsequently flown to Chicago. From Illinois, a refrigerated truck brought them to our lab in Columbus. The cores can be in transit for more than a month."

The facilities at Ohio State are impressive: a Class 100 Clean Room with all the necessary instruments to measure the chemistry and dust in ice cores without introducing foreign elements; four mass spectrometers; a machine shop for developing the drills; and a -30°C cold storage vault currently containing 7,000 meters of tropical ice core, the largest such archive in the world.

But what's so important about ice, especially tropical ice, that a 58-year-old university

professor, with a Ph.D. in Geology, would risk life and limb just to study it in his lab? The answer: It holds the history of our planet's climate, and in that history, keys to its future.

"I believe that tropical climate variability plays an important role in determining the climate of the rest of the earth," declares Thompson. "I also believe that glaciers in the tropics are the 'canaries in the coal mine' for the earth's climate system. The tropics are characterized by temperature uniformity, and in fact all tropical glaciers are retreating. Where we have time lapse measurements, we can see that the rates of retreat are accelerating."

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Lonnie with one of the remaining remnants of the Eastern Ice Field on Kilimanjaro. Since 1912 Kilimanjaro has lost more than 80 percent of its ice cover.

In other words, Thompson considers research conducted on these ice cores as well as documentation of glacial retreat as proof: The earth is warming up. In fact, due to global warming he believes that in as little as 15 years the only place to see Kilimanjaro's famous ice will be in his archive at OSU.

More incredible than his research, influence or even the rigors of mountain climbing with asthma, are the obstacles Thompson overcame to obtain even a high school education. Raised poor in Cassaway, West Virginia, his father hampered by an eighth grade education and a heart condition, Thompson worked four part-time jobs to help make ends meet. Still, his interest in weather and climate developed early. "I had a weather station in the loft of our barn, and I received daily weather maps from the National Oceanic and Atmospheric Administration (NOAA) from which I would make forecasts. I used to raise lunch money by making bets on what the next day's weather would be."

When Thompson's father died of a heart attack during his son's senior year in high school, his mother impressed her kids by earning a GED,



(Above) The Ohio State field team making its way across a mountain ridge in northern Peru. (Below) Lonnie and long time Peruvian colleague, Benjamin Vicencio, after discovering a 5,000-year old plant uncovered in the retreating margin of the Quelccaya ice cap in southern Peru.

thus instilling in them the idea that only through education could they make for themselves a brighter future. Her son began at Marshall as a physics major but ultimately chose to pursue a degree in geology.

"In my junior year I took an introductory geology class with Professor Jansen, who was the chair of the geology department at the time," Lonnie explains. "I did well in his class and he asked me if I would like to work for him along with a few older classmates on a project making mineral sets for the State Parks of West Virginia. It was while working with him I became convinced that I wanted to become an earth scientist."

He also met his wife at Marshall. Dr. Ellen Mosley-Thompson holds a Ph.D. in Geography (Climatology) from OSU, teaches at the university and conducts her research in Antarctica and Greenland off-season to her husband's. In that way, one spouse was always available to parent daughter Regina when she still lived at home.

Mosley-Thompson grew up in the Charleston area and graduated from Nitro High School in 1966. An avid student of science and physics, she studied at Marshall where she became only the second woman in school history to graduate with a B.S. in physics.

Lonnie and Ellen began working together as graduate students where they built the Ice Core Paleoclimate Research

Group. Ellen has been to Antarctica eight times, seven as the field team leader, and to Greenland five times, each time as the field leader where she oversaw ice core drilling projects. All of her team members have been men.

"Frankly, I rarely think about the gender composition of my field teams," she notes. "Lonnie and I consider the quality of the individual – their curiosity, motivation and enthusiasm – as the highest criteria when selecting our students. But over the last 15 years it has been very rewarding to see more young women going into the geosciences and joining research groups and taking faculty positions. Today, women are strongly represented in our group of graduate students."





(Above) Just another day at the office – Lonnie on a snowmobile traverse in West Antarctica in 1972.

"I have already accomplished more than I would have ever expected when I graduated from Marshall in 1970. However, there is yet more to do and 'philosophical' mountains to climb."

Lonnie and Ellen are a formidable team, each operating under their own travel schedules but ultimately sharing their research and data to achieve a collective knowledge that is changing the way we view our world. Nearly 90 percent of their papers have been jointly authored.

Global warming is a phrase heard or read often in the American mainstream media, but there seems to be some confusion about what it is, and in some circles, a suspicion that it may not even exist. First of all, the debate among most scientists does not revolve around whether or not the planet is actually getting warmer; that's easy enough to prove with simple measurements. Instead it revolves around humans. Has our increased usage of fossil fuels over the past century, which consequently

led to increased greenhouse gases in the atmosphere, made the planet warm up?

Thompson believes his research shows humanity is contributing to this warming trend, but also of great importance, he believes humanity can do something about it. "All of us need to conserve natural resources, and we should be doing this whether or not global warming is a problem, which it is, simply because the supplies are running out. We need to develop alternative energy sources and more energy efficient products. In order to reduce fuel consumption and human-induced greenhouse gases, we must move to hybrid technologies for cars and mass-transit like fuel-cell powered trains and buses, especially in places like China and India with their developing mega-economies."

His wife and partner agrees. "It is essential for the continued well being of humanity, and indeed many other life forms on the earth, that we begin to attend to the quality of our environment by considering how we use resources. I feel strongly that the time for action is now

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– Dr. Ellen Mosley-Thompson

and to delay action will only result in larger changes with greater potential to affect the economic, social and political future for generations. The course of action must be based on a societal commitment to sustain the earth's life support systems for future generations."

The Thompsons assert that individuals can do many small things to reduce the environmental pressure that they exert on the planet. Starting with simple steps such as reducing personal consumption, eating more vegetables and less meat, replacing incandescent bulbs with compact fluorescent bulbs, turning off the lights when you leave an empty room, using public transportation when feasible, using natural vegetation in your yard and avoid application of pesticides, slowly acclimatize to a slightly cooler house (say 2 degrees C) in winter and a slightly warmer house in summer. These are all baby steps but if 296 million Americans were to all take such steps, nations would have a real chance to reduce their dependence on fossil fuels and increase the length of time before the "end of the oil and gas era" so that we can bring alternative sources into wide scale use.

As for any skeptics who assert that global warming is simply a natural part of the earth's climate cycle, Thompson says, "Name someone who has ever really studied climate or collected data. I bet you can't. Glaciers have no political agenda. They don't care if you're a Democrat or a Republican. Science is about what is, not what we believe or hope. And it shows that global warming is wiping out invaluable geological archives right before our eyes."

Lonnie and Ellen Thompson shine as two of

(Left) Lonnie and Ellen at an awards reception where Lonnie received the 2005 Tyler Prize for Environmental Achievement, an award regarded by some in the field as the equivalent to the Nobel Prize, for the lifelong accomplishments of his ice core group. In 2002, both Lonnie and Ellen were awarded the Common Wealth Award for Distinguished Service for Science and Invention.



Lonnie and his decades of scientific research on global warming were featured in the Nov. 17, 2005 issue of *Rolling Stone* magazine.

Marshall University's most successful and renowned graduates.

With the assistance of his wife and partner, Thompson was named one of America's Best in Science and Medicine by *Time* magazine and CNN in 2001. He was given the John Marshall Medal, the Vega Medal from the Swedish Society for Anthropology and Geography, and the Dr. A.H. Heineken Prize for Environmental Science from the Royal Netherlands Academy of Arts and Sciences—all in 2002.

In addition to numerous other awards, Thompson also won the 2005 Tyler Prize for Environmental Achievement, a prize some regard as comparable to a Nobel Peace Prize and formerly awarded to such household names as C. Everett Koop and Jane Goodall. He has sat on nearly a dozen committees and editorial boards with important acronyms like NOAA and heady locations like Cambridge, England. He's published more than 165 scholarly articles or papers and been awarded 53 grants, both governmental and private, to fund his expeditions.

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Ellen has also been the recipient of the John C. Marshall Award (2002), for distinguished scholarship; election as a Fellow of the American Association for the Advancement of Science (2003); induction into the Ohio Women's Hall of Fame by Gov. Bob Taft (2003); and the University Distinguished Scholar Award (2003) from Ohio State.

Despite these professional kudos, the Thompsons sum up their personal philosophy in ten simple words: "Leave any place a little better than you found it." □

Marla Brannan is a freelance writer living in Huntington, W.Va.