

I. COMMENTARY

This was the year of the funnel cloud and phantom tornado! Funnels were everywhere (generally small, high base events) and some tornadoes (mostly in April) but rarely where chasers were. It was an interesting chase year, with a big winner (Erik and Lisa Rasmussen photographing nine, saw 14, on May 10); a first timer (Lou Wicker puts "TOTO" in the path of a tornado) and in-depth media coverage of chasing by National Geographic (magazine and cable television). Although only one classic tornado situation presented itself during the Editor's three week trip (which he missed), there were several interesting storm chases throughout this spring. In fact, the stories of missed tornadoes are almost as good as the few actual intercepts. Despite a very active April with several multiple outbreak weekends of 20-30 twisters at a time, very few were actually photographed. The Editor saw five distant ones and photographed four (one missed due to exposure problems) and photographed 16 funnels (most of the latter with his daughter, Sarah, on her second chase trip). None of these tornadoes were anticipated when they occurred. In fact, that can be said of most of this year's intercepts -- more on this later. No one that I know was in Ohio or Pennsylvania on that last May Friday, when their world turned upside down. A few of us saw the first tornadic thunderstorm go up east of us near St. Joseph, MD, Thursday evening. However, the system was moving too fast (jumped four states in 20 hours) for any chaser to follow. Also that area of the country doesn't lend itself to chasing (more trees and hills), and the atmosphere isn't as clear on a humid day as it is in western states for spotting storm bases at a distance. --- On balance, May, 1985 was not a good month for plains twisters, at least not by seasonal expectations. From chase reports, the last half of April through May 10 was best. However, the normal mid to late May peak didn't occur. This was also true last year and, to some extent, for 1983. The Editor is beginning to wonder if we are in a short term period of climatic change, with the season's peak moving up a week or two on average. Perhaps an earlier chase trip next year is called for. What are your thoughts on this?

II. ROSTER

The Roster lists names, addresses and brief biographies of those interested in or willing to correspond with others about storms. Normally, only recent entries since the last issue are included.

Name	Address	Chase country - range
Bob Welch	P. O. Box 7353 Virginia Beach, Va. 23458	Southeast and south-central Virginia, northeast North Carolina and beyond

(Biography: Age 28, native of southeast Virginia. Wife, Maria, was born in San Antonio, Texas; and a 20 month old daughter, Sarah. Works for car dealership by day and cleans offices at night ("Pays our bills, as well as our weather ventures."). Keeps a personal journal on weather of southeast Virginia and beyond - "I've always had a particular interest in storms, but I also find pleasure in observing calmer aspects of weather", and in photography. Both Bob and Maria are born-again Christians, which fits well with "a fascination in our Lord's atmospheric creations."

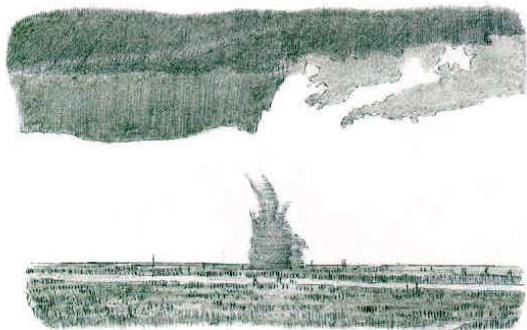
III. LETTERS/PHONE CALLS TO THE EDITOR

Bob Welch relates his experience with a cool weather waterspout. "It was April 9th, and Virginia Beach was under the influence of a Canadian high pressure system, with afternoon temperatures in the 50's. However, Atlantic moisture, brought in by strong northeast winds, was also forming well developed cumulus - although no storm clouds. I was driving south, along the ocean front, and looked in my rear view mirror - and there it was. A small, white funnel cloud to the north - over the Chesapeake Bay, where it meets the ocean north of Virginia Beach. By the time I could stop for a picture, it, was gone. Such activity this far north is quite uncommon. To have one in the midst of a cool wave was, I am sure, a rare occurrence." --- Bob also had an idea for a new section in Storm Track on Regional Weather, including summary reports for the preceding two months. "Well informed readers would contribute reports for their 'home regions.' I would do so for southeastern Virginia and, possibly, for northeastern Carolina, as well, since I visit that area frequently and have access to weather information down there. Are there other readers, who would be willing to report regularly on their regions? --- As for southeast Virginia, things have been a little interesting stormwise. On June 5, a line of strong to severe thunderstorms hit the area, resulting in strong wind gusts (40-45 MPH), considerable rain (over two inches in some parts) and in Surrey County two tornadoes and golf ball hail. Another group of thunderstorms hit the afternoon of June 12, during which I managed to get an excellent photo of a wall cloud out over the ocean (no funnels, though). All in all, I feel that this summer could be a much-above-normal season here in terms of storm activity. Hurricane? What's a hurricane? -

is what they say around here. This city has been most fortunate through the years, as severe weather, and especially hurricanes, goes."

(Editor's note: If you're interested in contributing regularly to a new section such as this, please let me know. This need not be comprehensive of every part, of the country, just a few brief reports on a local weather event that characterized your area over the last few months. Bob has given us a good example of this.)

Bruce Boe writes that "with the number of ST readers/contributors you are in contact with, there may be some photographers that need graphics (35 mm) of the type I sent you last year ("Tornado Photographs by David Hoadley"). I engage in that sort, of production as a hobby (as well as a supplement to my professional abilities) and would be glad to take on such production for others. I do titling, graphics, super-imposition and -yes- can even place titles/credits on other's 35mm slides." (Editor's note: The referenced slide sent to the Editor had white lettering super-imposed on a lightning illuminated, classical night-time thunderstorm. It was a very professional job, and I use it regularly now in my slide shows. Consider your title/name on a copy of your favorite slide. Write; Bruce Boe, P.O. Box 2148, Montrose, Colorado 81402.)



SE of Watonga, May 13, 5:50 PM CDT

Although received too late for inclusion in the last newsletter, Bill Bunting writes: "As a lifelong Virginian/turned Oklahoman, I'd like to tell you how much I enjoy ST. I read it, with interest. It is a valuable method of exchanging notes between seasoned chasers and a great source of information for neophytes. Here is some information that I believe would be of interest to you and readers of ST.

To begin with, I am the supervisor of the NOAA Weather Radio broadcast unit at the National Weather Service (NWS) Forecast Office in Oklahoma City (OKC).

As a chaser, I am aware of the critical need for real-time information, available quickly and easily. Here in OKC, the NWS operates one of the most technologically advanced and progressive offices anywhere. Many valuable sources of severe weather information are available. They include Doppler radar from NSSL (National Severe Storms Laboratory in Norman), digital radar data (Radep - II), local mesoscale objective analyses, and a well coordinated amateur radio network. Here in OKC, this data offers the opportunity to provide residents of the state with very accurate warnings and statements. Extensive use of this information is made on NOAA Weather Radio (NWR), both in recorded form and by short-term live broadcasts. Of potential value to chasers is a new product, called the "Oklahoma Thunderstorm Outlook." This product is issued daily, around 2:00 PM and is updated whenever needed. It is broadcast over all six NWR stations across the state, and is very detailed, much more so than information on regular AM or FM stations. I have included a sample copy ... which goes a long way to provide an easily accessible source of information. This thunderstorm outlook, coupled with our hourly-updated radar summaries and state weather summaries, provides a great deal of information to chasers in Oklahoma. I would appreciate your making this information available to your readers. One final note: The thunderstorm outlook is broadcast daily from March 15 until June 30 from Clinton (162.475 MHz), Enid (162.475 MHz), Lawton (162.550 MHz), McAlester (162.475 MHz), Oklahoma City (162.400 MHz) and Tulsa (162.550 MHz).

'...scattered thunderstorms expected over east and south-central Oklahoma this afternoon and tonight .. a few thunderstorms may become severe...

Afternoon weather maps show some features that are conducive to the development of thunderstorms over eastern and south-eastern Oklahoma. The area most likely for thunderstorms is generally east of a line from Miami to Tulsa to near Ardmore.

Map features include .. a shallow layer of moist air over the area, along with a moderately unstable air mass. A weak front that has become nearly stationary was located from near Bartlesville southwestward to just south of Lawton. A dry line was located 20 to 30 miles ahead of the front.

The best area for initial thunderstorm development is in south-central Oklahoma in the vicinity of Ardmore and Marietta late this afternoon, with thunderstorms developing and/or spreading into southeastern portions after dark. For northeast parts of the state .. thunderstorm potential will be at its best in the middle part of the night-time hours.

Due to uncertainty at this time. .. an additional outlook will be issued around 5:00 PM this afternoon.'

Tim Marshall sent in the first storm report to ST for 1985. "Severe storm season arrived this year on

February 22! Early that morning, SELS put the Dallas area in the first "Slight Risk" of the year for severe storms. By afternoon, it was the first "Moderate Risk." By evening, we were under the first tornado watch, severe thunderstorm warning, and flash flood warning. Who says things aren't big in Texas? You'll probably ask, 'How many tornadoes?' Well, I didn't even chase. Here's why.

When I first began to chase storms, I chased every time SELS put out a "Slight Risk" or better. Consequently, there have been many "busts" (A bust is defined here as chasing blue sky all day). It didn't take me long to realize that SELS was forecasting severe weather, not necessarily tornadoes. The problem was one of definition. As you know, a severe thunderstorm is defined as a storm where winds exceed 50 knots, hail exceeds 3/4 inches, and/or tornadoes. As a tornado chaser, I have been more interested in the supercell variety of severe storms, since they are more efficient tornado producers. The next problem was trying to separate SELS general category of severe storms from the tornadic storms. This has always been a difficult task.

The morning maps had many of the ingredients for severe weather. An upper, closed low had moved into Arizona and brought plenty of cold air advection. The mid-level jet diagonally bisected Texas. Surface analyses showed ample moisture over the state, with surface dewpoints in the mid-60's. Although clouds prevailed over the area, the air mass remained very unstable. Forecasted lifted indices were near -10 C. Winds were southeast at 25 kts, gusting to 40 in Dallas. By noon, the dryline had passed Lubbock. Skies cleared, and the wind backed to light southwest. A storm had developed earlier near Sweetwater, with cloud tops over 50,000 feet and radar intensity at VIP 5. SELS updated the risk area to "Moderate" at that point, citing stronger PVA (than first anticipated) moving into the area. Though severe weather appeared imminent, the tornado situation was just NOT there. Basically, the dynamics were so strong and the air so unstable, that it appeared the atmosphere would overturn early in the day. This looked more like a classic squall-line situation, which is generally a poor tornado producer. Given the time of year and the slim odds, I decided to stay home. By 4:00 PM, a squall line was indeed fully developed from Abilene to Wichita Falls. Most of the line was embedded with VIP 3's and 4's. However cells decreased in intensity after sunset.

With the approach of the upper trough, redevelopment began ahead of the dryline in late evening. That's when SELS put out the tornado watch. It didn't take long after that until severe weather began occurring near Dallas. The squall-line passed around 1:30 AM, prompting a severe thunderstorm warning for Dallas County. Incredible inflow caused widespread damage. Wind gusts of over 70 knots were reported in some places. What a way to start out the year.



For the last six years, I've kept a detailed log of EVERY chase. This log includes personal weather observations, surface and upper air maps, and occasional satellite photographs. Yes, most chase days were unsuccessful, where (a) blue sky was watched all day, (b) storms developed into squall lines, or (c) an isolated storm developed and died, leaving just a cirrus anvil. However, weather maps were still plotted for these "bust" days. Though this may seem frustrating, I would rather not be on a first name basis in all the Dairy Queens in West Texas. So, I believe that learning about your bad forecasts will eventually make a better forecaster and chaser."

IV. BULLETIN BOARD/COMMERCIAL MARKET - \$- FOR PICTURES

V. CAMERA TIPS

VI. TRAVEL TIPS

VII. FEATURE

Chase 1985

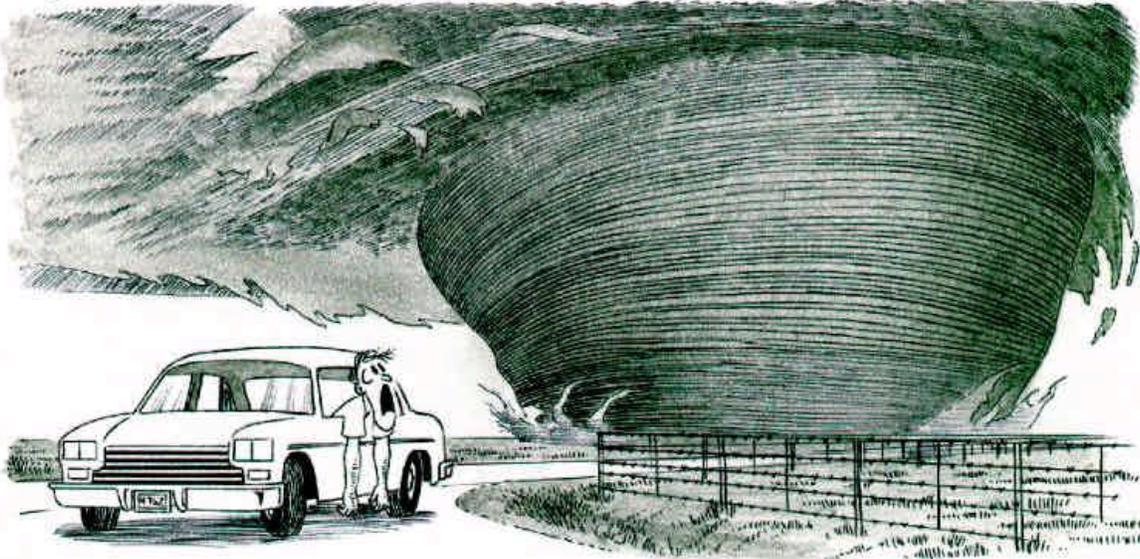
April - The Peaks and the Troughs

(The following account has been gleaned from numerous scraps of notes from several phone conversations. The Editor has tried to keep the dates straight.)

On Friday, April 19, a major four-day tornado outbreak began from the Dakotas to Texas. Each day produced 20-30 tornadoes along an almost border to border, south-north jet stream. While frustrated chasers back east, like Roy Britt, Jim Leonard, Randy Zipser and myself, sat, goggle eyed in front of the nightly TV weather shows, watching football anvils blowing up across the mid-west, here's what was really going on.

Al Moller couldn't chase until Monday and only caught one "hailer" near Waco. Tim and Kay Marshall chased 1,600 miles in four days and caught one funnel cloud. On Sunday, they watched with some discouragement an apparent squall line in southwest Oklahoma, extending from there on down into Texas (likely hailer but unlikely tornado producer). Like Gene Moore and others, Tim had little time that weekend to stop at local weather stations and analyze the situation. It was seemingly one of those magic times, when you were surrounded by an ideal, enormously-unstable and tornado-ripe air mass.

Thus, Tim relied mainly on telephoned reports and advice from his friend, Al Moller, a forecaster at the National Weather Service Office in Fort Worth (likewise, Gene Moore phoned his contacts at the National Severe Storms Lab (NSSL) in Norman). When Tim called that Sunday afternoon, Al said forget Oklahoma, drop everything and charge south to the area below Wichita Falls. Radar indicated a big storm there, building fast. Down they went, flying low all the way. Unfortunately, the Marshalls were a half hour too late to see a mile-wide (!) tornado near Throckmorton and another nearby storm with a pair of tornadoes; one a half-mile wide!! They were moving so-o-o slowly at 5 MPH under a split jet. The anvil covered most of Oklahoma! (Groan.) However, at least one chaser was there (an ST subscriber) who later described two flanks into that end of the squall line that Kay and Tim were observing in Oklahoma. When the "miler" appeared, it was imbedded in light rain and was a classic cone shape. So, where are the pictures? The lone ST chaser who saw it was so awed; his first ever



(!) by this monster, that he just sat and looked -- and never took a single picture! True "system overload". Who was that chaser? ST respectfully withholds that information. Undoubtedly however, no pictures will be needed to relive that moment -- his memory is now the negative, and all he has to do is close his eyes ... aaah.

However, the Croix de Guerre and the coup de grace were yet to be delivered. On Monday, April 22, NSSL and OU research/chase vehicles set out from Norman for western Oklahoma. But -- oops. Wait! The four-wheel-drive, lead NSSL van has a mechanical problem; cannot get into gear. Not far out, it limps back, and the caravan starts out again, consisting of a backup / lead van, a flat bed truck with TOTO (instrumented 400 lb. cylinder to place in the path of a tornado), a University of Mississippi lightning research van and a Minneapolis TV film crew. The OU chase team was in one additional vehicle, with Howie Bluestein. As they moved into western Oklahoma, Howie had little hope for anything tornadic, since early towers were building too much in a straight line. The NSSL-led caravan of four decided to head southwest, while the lone OU van continued westward, but without much conviction. (It was anybody's guess at this point). Suddenly, one of the towers to the west began to swell explosively, and a tornado started coming down, just as the OU gauge hit EMPTY, and they had to stop for gas!! Frustrated chasers bolted and necks craned to see past commercial buildings in Weatherford as the gas was pumped. Charging up that road again, that large tornado north of Clinton was now mostly wrapped in rain, with poor photographic contrast. However, a second one soon formed near Custer City, and this afforded their best (award the Croix de Guerre) shots. Although smaller and barely touching ground, it contorted into a snake-like tube, with highly visible rotational waves "rippling up and down the vortex sides". Other large tornadoes occurred further east and south and were photographed by Gene Moore and others, including a Channel 9 helicopter near Weatherford and Eakly. The one near Weatherford was described as of Union City size (May 24, 1973) or larger.

Interestingly, and according to Chuck Robertson (arrived too late for the tornadoes), the warm front was well to the south (Altus 77 deg and Oklahoma City 67 deg), with the Eakly mesocyclone drawing inflow from the east-northeast. He was even perceptibly shaking in the cool inflow near El Reno, as that still potent storm passed by, with occasional weak suction vortices at the surface and "smoky" light shafts penetrating a partially open core. But what of the NSSL chase caravan on this day, when two of the four major tornadoes from here to Nebraska occurred within 15 miles of each other in western Oklahoma on probably the best "Okie" chase day that spring? Chris Johns, a writer from National Geographic, on one of his first chases, relates the rest;

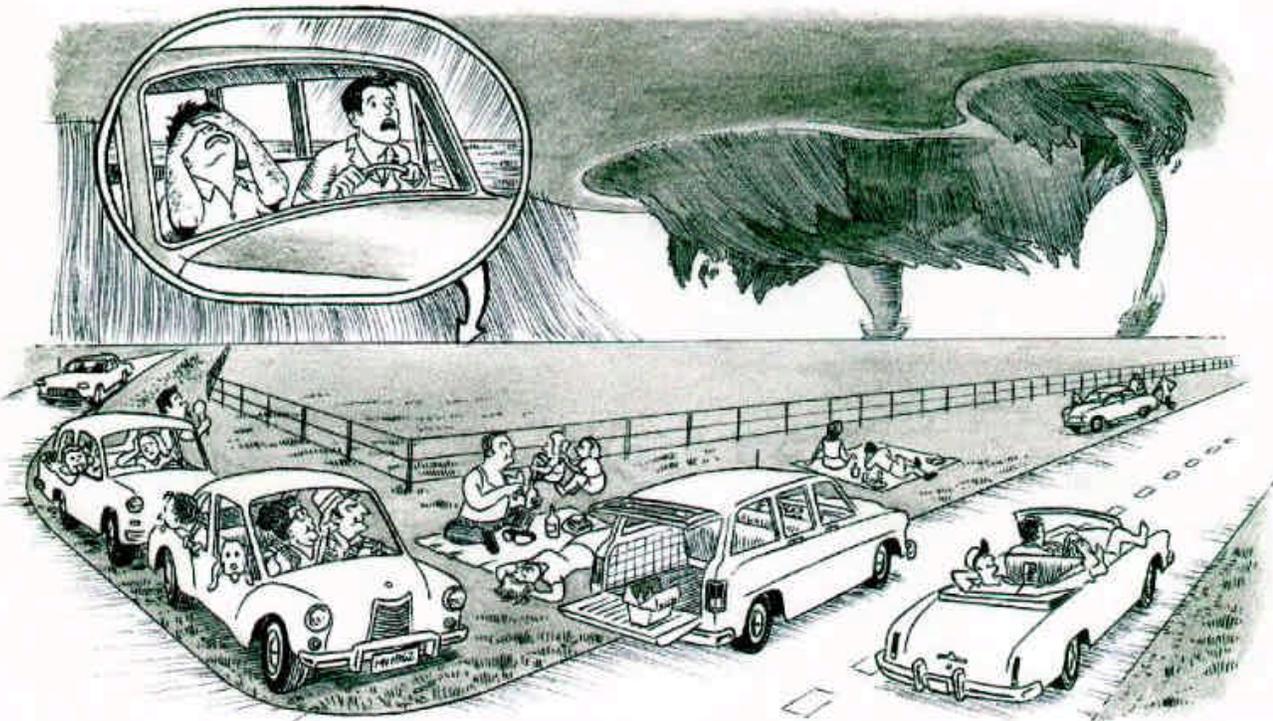
With a nearby, beautiful and hard edged anvil spreading across the sky, the caravan charged on into southwestern Oklahoma. The nearing cloud base beneath the anvil began showing "incredible rotation." Looking for a short cut, the lead van turned onto a dirt farm road -- the driver forgetting that this backup vehicle didn't have the accustomed four-wheel-drive (Oooops). Mud! Stuck! All four vehicles. @*#@***!! That was the day for NSSL; not a single tornado or funnel picture. When the Geographic

magazine article is published (perhaps next fall), look for a classic picture of real, hard-core chasing -- as frustrated men and muscles strain to move their vehicles onto drier ground, against the back-drop of a magnificent anvil and a storm base that would always be just beyond range (the coup de grace).



(Ironically, that, same NSSL crew would go from total depression to wild elation within a week, when they succeeded for the first time in five years, against incredible odds, at placing TOTO in the actual path of a tornado. Sometimes things have a way of balancing out. More on this later.)

Since his mid-April arrival in Oklahoma, the National Geographic writer Chris Johns had only seen two small, distant tornadoes (not Geographic quality) and was still looking for the big one. After an April 28, Sunday morning briefing by NSSL, Chris decided to switch teams and joined Gene Moore on a chase to Lubbock in Chris's rented Jeep Wagoneer. However, little was going on there, so Gene called the Lab for an update. It gave an otherwise good report but inadvertently left out one key item -- information on an outflow "bubble boundary" from an old storm near Abilene. Consequently, they tarried too long in Lubbock until a satellite picture picked up the first rapid buildups along that boundary near Big Springs, and 100 miles south! Thus, when the first tornadoes started coming down, Chris and Gene were still charging south just an hour too late! The worst frustration was listening to their radio, all the way down, to repeated bulletins from local stations as the slow moving storms dropped one after another. In fact, one bulletin urgently asked residents of Lamesa not to get in their cars and drive down to Big Springs to look at the show, since road shoulders were becoming crowded! There was the irony -- two experienced chasers coming all the way from Norman, Oklahoma after 350 miles and knowing they were still 100 miles out of position -- seeing an enormous anvil and listening to reports of casual Sunday drivers taking their families out for a little side trip to look at multiple, slow moving tornadoes on the ground just up the road!!! Arrrgghh!

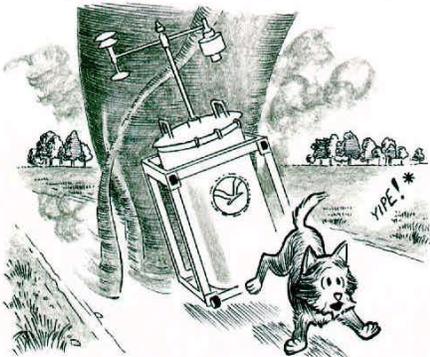


But, wait! That was just the start of the week. There is still Monday (can it get worse? Of course!). Our two frustrated chasers rose early at 6:30 AM in Sweetwater and headed back northeast towards

Oklahoma. Most of the day was quiet. Howie Bluestein, a professor at Oklahoma University and faculty leader of their research-chase team, was in Boulder, Colorado, apprehensively looking over the morning synoptic situation for Oklahoma (his bags packed and reservation in hand for a fast 10:30 AM return flight). However, the situation wasn't that clear, the plains had been quiet, and his colleagues (names well known in the field) saw no prospect for major severe weather that day; "Howie, don't worry about it." Six hundred miles away, Chris and Gene had finished an early dinner in Ringling, Oklahoma. Gene called Don Burgess at the Lab. Big storm blowing up near Arlington, Texas! Rubber burned, and south they charged!! Passing through Ardmore and Gainesville, they did a "core plunge" through a dark rain/hail shaft ten miles south of Denton, Texas. However, there was nothing promising on the south flank, so, since it was getting dark, they started back north. At about this time (7:00 PM), Howie again looked at the latest satellite pictures. Now, he saw the first small white "spot" south of the Red River -- and knew what was going to happen. Too late to fly down and join his TOTO crew. "Where were they?" he wondered.

Lou Wicker, spending what might be his last graduate year at OU, wanted one more crack at driving TOTO into a tornado. As already mentioned, the Totable Tornado Observatory (an official, though thinly veiled, euphemism for the Kansas terrier that was swept to Oz in a tornado) is a reinforced, white, 400 lb. cylinder, loaded with instruments to record atmospheric changes in a tornado. Highly touted at its outset, the Lab had been trying in vain for five years and dozens of drops to place it in a tornado's path (the half mile wide Binger tornado was a tantalizing but near miss). The crew is trained to offload it in as little as 12 seconds. Today, April 29, was to be the day! With Lou at the wheel and other NSSL chase vans close behind, they drove south of Norman. The radio crackled constantly as the Lab radar operator intensely studied his scope and directed the chasers; first one way and then another. Finally, they were directed toward a storm near Ardmore. At first, Lou didn't think it looked that good. It was embedded in high overcast and just didn't interest anyone.

Suddenly, the storm began to grow, bases became hard and darkened, and rotation began as a large ragged cone ominously descended. Charging down unmarked roads and guessing at their directions, Lou dropped his cargo on one and took off down another. Thinking they were driving away from it, the swiftly expanding storm base began moving in their direction, even as the "big cone"



* Oh, no! A transportable terrier object has been kicked by a totable tornado observatory!!

At 9:00 PM and after a two day 1,400 mile chase, Chris Johns and Gene Moore returned to Ardmore, where they had been only hours earlier, in time to see semi-trailers on their side and flashing red lights through the night rain speckling their windshield (bemoaned Chris, "These were the only two days that I didn't chase with NSSL). A storm that surprised everyone had dropped the big one. That night, the OU students called Howie in Boulder; "I just about died!" he said, bags still packed and cancelled reservation in hand.

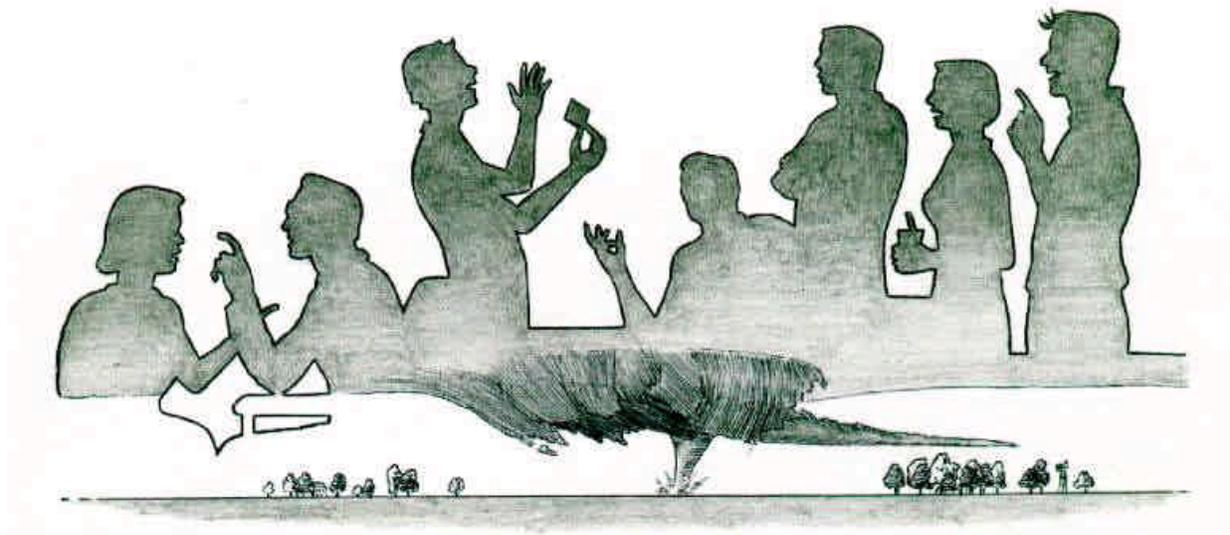
swirled down, skimming the tree tops. Down it went, up, then down again. Two tornadoes were reported! Limbs ripped and semi's flipped on the Interstate! There was property damage near Ardmore. NSSL did outrun it, but TOTO got the boot -- displaced three meters by 125 MPH winds. Some of its instruments were damaged, so the success was mixed with limited results, but success, nonetheless! Upon hearing first word of this at the Washington, D.C. National Weather Service headquarters, Dr. Joe Golden (former team leader and founder of the NSSL chase program) exulted: "What? They did!?! Lou Wicker should get a gold medal!!! Such was the euphoria that gripped NSSL and OU. After so many tries, a winner. But, not all.



What went wrong for so many experienced chasers? Explanations were offered, including one that it was too much of a good thing -- too many severe storms went up, close together, competing for good organization and the inflow. One would become tornadic and then collapse early, against another's overriding outflow ... and so it went. Chasers rushed from one storm to another and just missed the good ones; or they saw storms embedded in pervasive anvil overcast and couldn't get a clear visual "fix" on which was strongest.

Also, interestingly, very few were right turners. Other problems were recurring cutoff upper-level lows that started as deeply penetrating long waves, and became cut-off from the main jet. Most chasers will tell you that these are tough systems to forecast. So, unbeknownst to the east-coasters, our western cousins weren't doing much better, despite those great satellite pics.

Thus, passed April, the peaks and the valleys, elation and frustration -- easily one of the most interesting storm months in recent chasing history. Next issue will cover May and -yes- more of the same trials, tribulations and triumphs (bow to Rasmussen). The Editor will also review his chase record, which included five days with his daughter, Sarah, a storm chaser's barbecue, the National Geographic film crew, and a notorious tornado "smoke" day.



(Although this final thought comes at the end, I am writing it first, while overall reflections remain clear and uncluttered by the details of this year's chase.)

The one overriding impression left from this storm season is the rich and diverse blend of unique human experience that is represented by storm chasers everywhere. In phone conversations, at the barbecue and in chase encounters out on the open road, there is such an absorbing, vital and protean human interaction as can't begin to be described in this poor vehicle. The diversity of chasers coming together from government, carpentry, baking, photography and meteorology; relating storm experiences, passing photographic tips, showing pictures and film; giving of their time and themselves; repeatedly confronting and sharing events that transcend normal human experience. One needn't even hear it all, when a chaser begins his or her tale. You need only see the shoulder's arch, hands raised to sketch the air, that certain grin and fire in the eye; and you know even then how good it will be, and you're already out there on the plains with him. Details change, but the exhilaration stays the same, when mere men go out to seek the wind and find a seething darkness pole to pole, oblivious of their meager needs - - defiant and magnificent. When chasers gather anywhere (two or twenty), that same current passes between that arcs the sky on summer nights. Those who have seen and know what they have seen are ever unique and forever marked. A vision of the earth that starts here and goes out to the hill top there, a hawk circling lazily above, the distant cloud-tower there, the curve of the earth, ... horizon beyond... boundless space and timelessness.