

heat wave, can be linked to greenhouse warming because weather can vary quite markedly on its own. Yet the recent events, says Karl, provide a taste of what will happen more frequently as the climate warms. For instance, the string of hot days in Brownsville would be predicted to occur in a stable climate once every 1,000 years. But if atmospheric greenhouse gases build at the present rate until the middle of the next century, such a heat wave would recur every 3 years, he says.

Computer climate models and theory predict that greenhouse warming will lead to more weather extremes, such as droughts and heavy rainfall. Already, U.S.

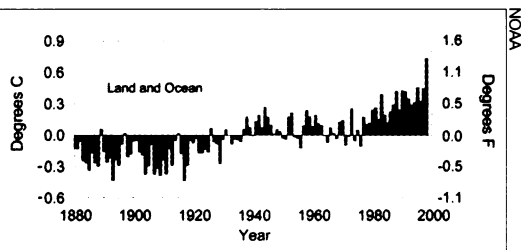
episodes of severe rain have increased since 1910, says Karl.

Other climatologists, however, dispute some of the administration's numbers. "I think many of the temperature records are questionable," says George H. Taylor of Oregon State University in Corvallis. He is Oregon's state climatologist and the president-elect of the American Association of State Climatologists.

"The quality of data in many foreign countries is rather poor and data are sparse in many areas of the world," he says. What's more, as researchers have made their climate models more sophisticated, they have lowered their forecasts of how much temperatures will increase in the future, he adds.

Critics of the Kyoto Protocol say that the treaty lets developing nations continue to emit greenhouse gases without restriction and that it will slow the U.S. economy, costing millions of jobs nationwide. —R. Monastersky

*Global temperatures for the first 6 months of each year, shown relative to the average.*



## Babies get a kick out of serial memories

Many researchers in developmental psychology assume that the human brain is unable to facilitate memory of the order of a few items or actions, presented one after the other, until around age 1. According to new evidence, however, even 3-month-olds can learn the arbitrary order of a list of items and, when given age-appropriate prompts, remember that information a day later.

"Brain mechanisms that mediate the ability to learn and remember serially ordered information are functional beginning very early in life," asserts psychologist Carolyn Rovee-Collier of Rutgers University in New Brunswick, N.J. "I view babies' recognition of serial position as a form of consciousness."

Rovee-Collier and her coworkers conducted separate studies of 18 babies who were about 3 months old and of 42 infants who averaged 6 months old. Experimental sessions took place in each infant's home. Babies reclined in sling-seats inside playpens. A flexible metal rod held a mobile overhead. Three mobiles, each containing seven yellow disks that displayed either black, green, or red A's, were presented in a fixed order.

Infants viewed the first mobile for 2 minutes while the researchers established the rate at which they kicked their legs. A ribbon was then loosely tied to one of the baby's ankles and to a hook suspended from the mobile. When the baby kicked, the mobile moved. Prior work has found that babies rapidly and avidly learn to bounce mobiles in this way (SN: 4/18/92, p. 244).

Youngsters had 6 minutes to play with each of the three mobiles. A child's kick-

ing rate during a subsequent 2-minute viewing of the third mobile, after the ribbon had been removed, provided a measure of the extent to which the kicking task had been learned.

The next day, as a memory prompt, each infant passively watched one of the mobiles for 2 minutes while it was moved at the rate at which that baby had ended up kicking the day before. Then a second mobile was presented either in or out of the previous order. Vigorous kicking in response to this item, visible for 2 minutes, indicated that it was recognized.

When mobiles were seen in their original order, infants of both age groups frequently recognized the second one, Rovee-Collier's group reports in the July PSYCHOLOGICAL SCIENCE. Babies exhibited poor memory for out-of-order mobiles.

In an unpublished, follow-up study of 6-month-olds, the scientists also observe good memory for the serial order of five mobiles, again after a 24-hour delay.

These results contradict earlier evidence suggesting that only older infants can recognize order in sequences. This capacity appeared in these studies only when children were presented with related actions that led to a desired outcome. For example, 11-month-olds could remember to unfold a hinged track and then place a toy car at the top of the track's incline in order to "make the car go."

"What's most important about this new study is that it shows that babies can learn and remember the order of totally arbitrary sequences," comments psychologist Herbert S. Terrace of Columbia University. "This capacity is essential for language learning." —B. Bower

## New spider: Unusual suspect steals web

The latest crime report, from Orchid Island in Taiwan, describes a new species of spider that snatches and eats pieces of other spiders' handiwork.

Little is known about this novel form of thievery, report I-Min Tso and Lucia Liu Severinghaus from the Academia Sinica in Taipei, Taiwan. Two other species, both South American, are known to steal silk. In the July ANIMAL BEHAVIOUR, the Taiwan researchers describe the third thief, which they have named *Argyrodes lanyuensis*.

"The whole creature looks like a drop of mercury with some appendages attached," Tso says. It shimmers along the webs of giant wood spiders, *Nephila maculata*. These webs stretch more than a meter across.

"When I was sitting under a tree having a break, I found in front of me two tiny silvery spiders doing something weird on one web," Tso recalls. Still munching on a cookie, the researcher leaned over to watch and realized the spiders were eating, too. They wadded silk into a ball to devour while the web owner, a much bigger spider, "seemed to pay no attention."

After observing the spiders' natural behavior and moving them around in experiments, Tso and Severinghaus concluded that the thieves reduced their hosts' webs by 21 percent on average. The thieves also stole prey from the hosts, but only occasionally. Less than 3 percent of the giant wood spider's diet comes from prey small enough for the little spiders to handle, the researchers report.

The thieves get away with stealing silk because they're small and they move stealthily, Tso observes. Some keep taking silk all day long.

Before laying eggs, the silk-stealing spider drops out of her host's web and spins a web of her own. She also covers her eggs with silk that she spins herself.

The report did not particularly surprise Jonathan A. Coddington from the Smithsonian Institution in Washington, D.C. "In general, *Argyrodes*, the genus, is always pestering *Nephila*," he says. Naturalists have documented many parasite-host relationships between the two genera, including prey-napping, egg-stealing, and stalking. "It's kind of like the Serbs and the Bosnians," Coddington says.

Fritz Vollrath of the University of Aarhus in Denmark points out that many spiders eat their own webs, which get tatty after a day of insect collisions, and then spin new ones. He discovered silk stealing in South American *Argyrodes* when he saw a spider dash into a smaller species' web. "I think it was after the owner," Vollrath says. "The owner just rushed out like a rocket," leaving the invader to eat the whole web. —S. Milius