



NATURE DETECTIVES

Spring 2002

PROVERBS FOR RAINY WEATHER

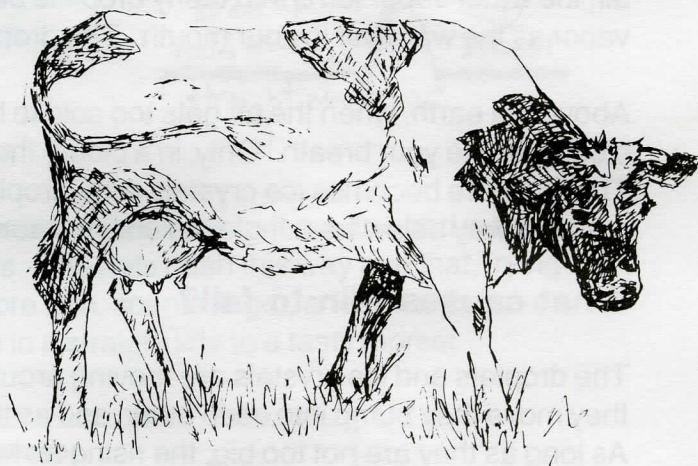
Many animals and insects are good weather predictors. Have you ever seen horses sniffing the air or chickens rolling in the sand? People long ago saw animals doing such things and noticed it would rain soon after. Before modern scientific experiments, people observed things happening in nature and created weather proverbs from what they saw. A weather proverb is a short, sensible statement about nature and the weather. Writing proverbs in rhyme makes them easy to remember.

If fowls roll in the sand
Foul weather is at hand.

If dogs and horses sniff the air
A summer shower will soon be there.

Why do animals do these things? Scientific studies have now shown that changes in the air before rain cause changes in animals and insects. Such changes can include itching, irritability, and better sense of smell and hearing.

When a cow tries to scratch its ear,
It means a shower is very near.
When it thumps its ribs with its tail,
Look out for thunder, lightning and hail.

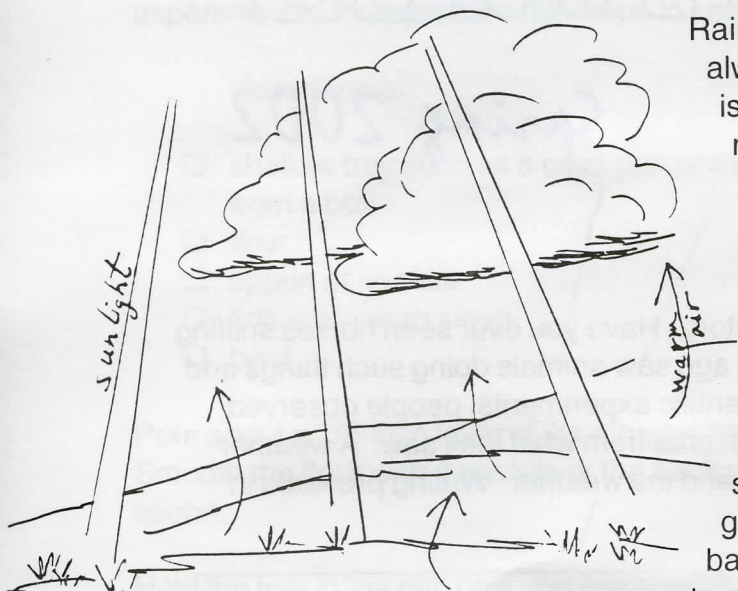


Are proverbs really true? Many are pure superstition. However, some are reliable because they are based on scientific facts. The proverbs for short-term weather forecasts tend to be the most accurate.

Proverbs are fun, and they encourage us to notice the wonders of nature around us. Observe your natural surroundings carefully. Do you have a weather-forecasting pet? What about birds and insects in your yard? See if you can create some weather proverbs of your own!

Rainy Weather Facts

What makes rain?



Rain is made from water vapor. Water vapor is always in the air, but we can't see it. Water vapor is made when water evaporates from lakes, rivers, oceans, mud puddles, and the ground. Water evaporates from plants and animals, including people, too. Evaporation is water warming and changing from liquid we can see (and drink or swim in) to gas we cannot see.

Why does it rain?

One simple answer is that it rains because the sun shines! The sun warms the air above the ground. The warmed air rises like a hot air balloon. The air cools as it rises because the temperature gets colder as you move away from the ground.

Cold air cannot hold as much water vapor as warm air. You notice this on a cold day. The air in your mouth has a lot of invisible water vapor in it. When your breath comes out into cold air, the water vapor turns into teeny droplets because the cold air cannot hold as much water vapor as the warm air in your mouth. The droplets make a little cloud in front of your face.

Above the earth, when the air gets too cold to hold the water vapor, teeny droplets form into a cloud just like your breath. Only, in a cloud, there are millions and millions of these droplets. The moisture becomes ice crystals if the droplets freeze. Just a few miles above the earth, the air is way below freezing even on a hot summer day.

What causes rain to fall?

The droplets and ice crystals are moving around in the cloud because the air is moving. As they move they bump into each other, and as they collide the drops and crystals join together. As long as they are not too big, the rising air holds them up. The droplets keep combining into drops a hundred times bigger than they began. When they get too heavy to float in the air, they start to fall. At first, the falling drops are round, but the air pushing against them turns them into tiny hamburger patty shapes.

Not all falling drops make it to the ground. If it is warm, some evaporate before they reach the ground. Strong upward wind drafts can blow drops back up. Starting down to the ground and getting blasted back toward the clouds and crashing into more drops and ice crystals before finally falling to earth is why some rain drops, snow flakes, and hail stones are bigger than others.



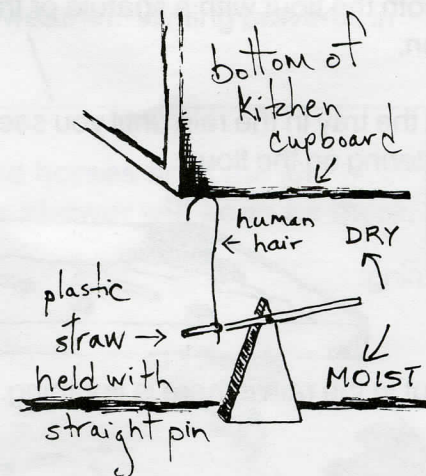
Can we tell it is going to rain?

Cloud color is often a clue in solving the rain-or-not mystery. Clouds with fewer droplets are light and fluffy, and sunshine coming through these clouds makes them look white. As the clouds get more moisture they block more of the sunshine and appear grayer. The darkest clouds block the most sun because they have the most moisture. But cloud color doesn't guarantee rain or no rain.

People who predict weather are called meteorologists. They study many factors before forecasting rain. Even with the best scientific instruments, they are not always right. One thing these scientists measure is the amount of water vapor in the air. The more water vapor in the air, the more likely it will rain.

You can make a simple device to predict rain from your hair. When there is a lot of water vapor in the air, your hair gets shorter. Blond hair changes the most, so if you don't have blond hair, you might ask a blond friend for a strand of hair.

Hair hygrometer



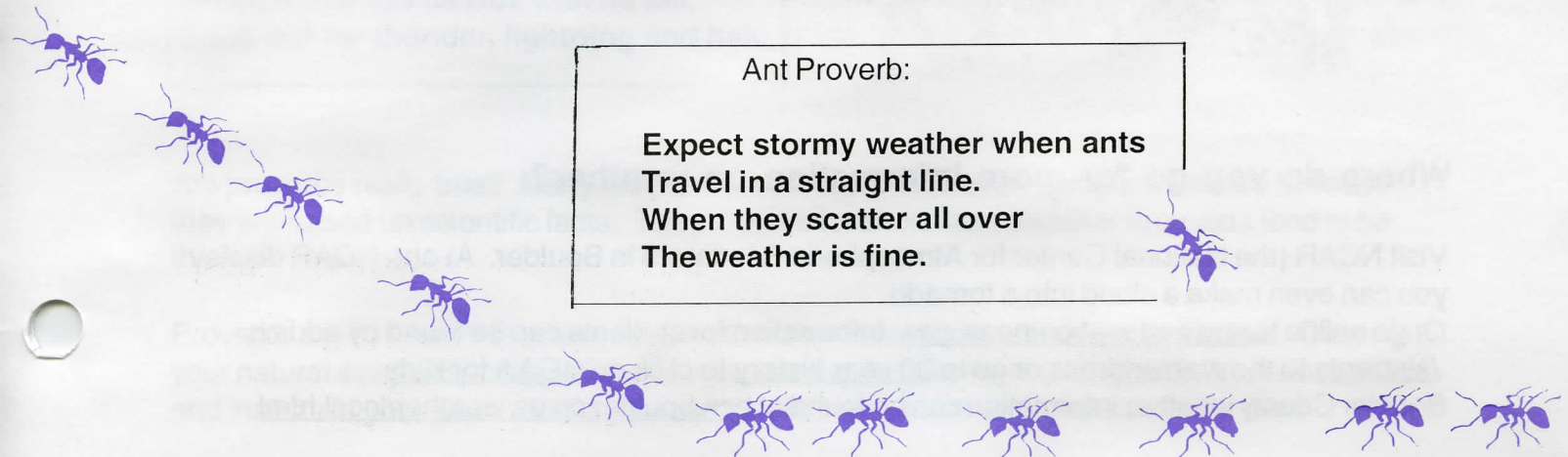
Can animals tell it is going to rain?

Some animals seem to be able to sense water vapor in the air. Bees stay in their hives when the water vapor increases. Scientists think they sense the moisture in the air with their antennae. They seem to know there is a good chance for rain.

Ants may be good weather predictors, too. Ants follow scent trails to food. In good weather the scents drift and fade quickly, confusing the ants. The ants dash this way and that, trying to follow a scent that keeps moving and fading. Before rain, scents linger, and the ants have a heightened sense of smell. Then, they can march in a straight line to a tasty morsel.

Ant Proverb:

**Expect stormy weather when ants
Travel in a straight line.
When they scatter all over
The weather is fine.**



Can you catch individual raindrops?

Raindrops come in different sizes. It is hard to catch a raindrop to look at it. Here is an experiment to try to capture raindrops to see if they are different sizes.

You will need:

- ☐ shallow tray such as a cake pan or the lid from a box
- ☐ flour
- ☐ spoon or spatula
- ☐ fine wire mesh sieve
- ☐ bowl

Pour about a 1/2-inch layer of flour in your tray. Smooth the flour with a spatula or the back of a spoon.

Hold the tray in the rain until you see raindrops splattering on the flour.

(Warning:

Do
not

go out in the rain if there is lightning.)



Bring the tray into the house. Carefully pour the flour into the sieve. Gently shake the sieve over the bowl to empty out the excess flour.

The balls of flour that are left in the sieve are captured raindrops. How many different sizes do you have? Draw your flour-covered raindrops here.

Where do you go for more information on weather?

Visit NCAR (the National Center for Atmospheric Research) in Boulder. At one NCAR display you can even make a cloud into a tornado.

Or go online to www.education.noaa.gov. Information for students can be found by adding /students to the web address or go to [30 year history](#) to click on [NOAA for Kids](#).

Boulder County weather information can be found at bcn.boulder.co.us/weather/local.html.