

# EXPERT EXPLAINS "WEATHER"

## Famous Scientist Takes Weather Apart to See What Makes It Act So Peculiarly; Scoffs at Professional Rainmakers.

By DR. FRANK THONE  
Science Service Staff Writer

What makes the weather?

And what makes the weather act so mean at times?

Whenever we get too much weather of one kind, as we have been during the past few weeks (or as we did of its opposite, last winter) we are apt to ask these questions. Sometimes in the brittle temper that persistent heat engenders, sometimes in dogged hopelessness—but we really would like to know a little about it, as if that would make our discomfort a trifle easier to endure.

Science cannot answer all weather questions, for science, and the science of weather in particular, is still "too young to know" all the answers. But science can answer some of them.

That weather happens at all is due to three interacting factors: the warming sun, the turning earth, and the presence of an atmosphere on our planet. Where the sun shines it gets warm; we've all noticed that. Where the sun shines on the



An Awesome Picture of a Tornado One of Weather's Freaks.

air, the air gets warm. Anything that is warmed expands and therefore becomes lighter.

Air rises when thus expanded and lightened, because cooler, denser air from somewhere else tends to flow in under it and boost it up, thus working toward a restoration of the disturbed equilibrium. Since the sun shines straightest and hottest near the equator, and has less heating effect near the poles, the general tendency is for the cool, heavy air to flow southward along the surface, while the rising, cooler air flows northward over it.

If the earth stood perfectly still and had a perfectly smooth and uniform surface, and if the warming sun went round and round it (as in the ancient Ptolemaic astronomy), the surface wind would always be straight from the north, and the upper-air wind straight toward the north.

### Two Forces Act Together

But the earth turns on its axis, and it doesn't hang onto the air as tightly as it does to land and water, so that the air tends to slip a little. If the north-and-south circulation set up by the warming sun did not exist, this turning of the earth would give us a wind straight out of the west, all the way to the top of the atmosphere. But as it is, the two forces act on the air together, causing an air-movement general trend from northwest to southeast in the northern hemisphere, and from southwest to northeast in the southern.

But this is not all of the picture. The surface of the earth is not perfectly smooth and uniform. It has mountain ranges sticking up here and there, which act as paddle wheels or blades to cause further deflections in air current directions. And it has alternations of irregularly shaped oceans and continents, deserts and forests, which load different air masses with differing amounts of water, and also act differently in squeezing that water out of them again, condensed into rain or snow.

The facts, then, rough out the broad framework of the world's weather-machine. In its details it becomes terrifically complicated. Is it any wonder that the weather sometimes gives even the experts who devote their lives to it a headache?

### Is the Climate Changing?

What is climate, anyway? What is the difference between climate and weather?

These questions puzzle a lot of

people. There is a difference between them, all right, though the dividing line is not knife-sharp.

J. B. Kincer of the United States Weather Bureau puts it this way:

"Climate is the general run, or sum total of weather, and that sum total does not seem to be undergoing any fundamental changes. Weather is the phase of climate that we experience from day to day and week to week, or even year to year. Therefore, weather varies, often abruptly from day to day, due to vast changes in air mass movements. In other words, climate is relatively stable; weather erratic."

Thus, we can speak of the climate as a more or less dependable thing. If you go to England in autumn, of course you take umbrella and rubbers; if you go to Southern California in summer, equally of course you do not. You count on the climate. Yet there might be a sudden erratic shift in weather, that would sizzle you in London in September, or drench you in Hollywood in June.

Climates do change, but not in a human lifetime, or even in a whole row of generations. Permanent climatic changes are jobs for the millennia. It is suspected that the climate of northern Africa was moister 10,000 years ago than it is now, but we are not certain. The climate of Ohio was once like that of Greenland—but that was a matter of a million years. The climate of Greenland was once like that of Ohio—but that was even longer ago.

### Cycles Are Irregular

Climate does have its fluctuations—that is, prolonged "spells of weather" of one kind, followed by equally prolonged "spells" of opposite sign. These are the "cycles" you hear talked about. About every thirty or forty years there is a climax of drought, like the one we are having now. In between, there will be an opposite climax of wet years. There may be other cycles within these, and perhaps, even longer ones outside them; but all the cycles are too irregular in arrival and duration to permit of dependable prediction just yet.

Those of us who can remember back to the early nineties will recall the bankrupting drought that scourged the country then. And an



To a Farmer Like This—the Weather Is All Important.

earlier generation found in a similar climatic depression the spur that sent them migrating to the Oregon Territory. Some of those emigrant trains left wagon-tracks across the dried bed of Goose lake, in Oregon. Subsequently the lake re-filled. But in the drought of 1934 the tracks were again laid bare. The cycle had fulfilled itself.

What causes these climatic cycles? Nobody knows. Sunspots have many champions—but also many opponents. That is one of the things on which the doctors still disagree—and the patient is free to suspend judgment or take sides himself, according to his own personal temperament.

When will it rain? What will make it rain?

To those anxious queries, certain pessimistic souls are singing the answer, in a doleful minor key: "It ain't gonna rain no mo'!" Nevertheless, it will: it always does rain, eventually.

But assurance that rain will come is not an explanation of its coming. What does make rain?

### Altitude Has Effect

Rain is the offspring of the marriage of contrasts. It comes when warm, moist air meets something cold. The something may be a land mass lying athwart a moist sea wind. The higher the land the harder the rain, other things being equal. That is why the rains of England and Ireland are gentle and moderate, and that is why precipitation is heavier, and frequently much more violent as well, on such mountain heights as the Himalayas and the top of Mauna Kea in Hawaii.

But in normal seasons we get plenty of rain, and frequently quite violent rainstorms as well, in regions where there are no mountains at all—the open sea, and the wide lowlands of the central United States. Why there?

Even in mountainless lands there are what might be called meteorological mountains. They are masses of cold air, migrating down from the Arctic and meeting the warm, moisture-laden air migrating up from the Gulf. The normal thing when two air masses collide is for the cooler to plow under the warmer, lifting it into the air. As it rises it expands, and as it expands it cools. When it no longer contains heat enough to keep the water in vapor state the water condenses, first into microscopic droplets or tiny snowflakes to form clouds, then by coalescence of the cloud-droplets into drops large enough to fall as rain.

### Frauds Flourish

Can't we do anything about the weather? Must we just sit still and let the rain come when it gets good and ready?

We can't. We must. For in spite of the old and oft-quoted complaint of Mark Twain, there is as yet nothing that can be done about the weather.

The usual crop of weather-making proposals has been harvested of the drouth. These pseudo-scientific suggestions always flourish when all useful growth is scorched with sun and perishing of thirst. They grow when even cactus wilts.

Rainmakers need only one kind of fertilizer: money. They invariably make the modest proposal: you pay my expenses while I do the work, and a bonus for every tenth of an inch of rain that falls. No rain, no bonus; only my living and travel expenses, and the cost of the secret chemicals used in my formula. If

## A Smartly Simple Frock



1933-E

Swingin' down the lane with a bit of a zip and a full quota of what it takes, this smartly simple frock goes places without effort—an engagingly youthful and chic affair which can be made in a trice (first cousin to a jiffy) and make you the belle of the campus.

Its simplicity is totally disarming, yet it has all the aplomb of a professor in English—just one of those frocks which can't miss. Delightfully cool and as chipper as a breeze, it requires just seven simple pieces in the making, in any fabric from the A's to the Z's. The yoke and sleeves cut in

one and the collar is just long enough to take the prize.

Send for Barbara Bell Pattern No. 1933-B designed for sizes 12, 14, 16, 18 and 20—bust 32 to 38. Size 14 requires 4 yards of 39-inch fabric. Send 15 cents in coins.

Send for the Fall Pattern Book containing Barbara Bell well-planned, easy-to-make patterns. Exclusive fashions for children, young women and matrons. Send 15 cents for your copy.

Send your order to The Sewing Circle Pattern Dept., 247 W. Forty-third St., New York, N. Y. © Bell Syndicate.—WNU Service.

## Household Questions

A mixture of one part vinegar and two parts linseed oil, applied with a soft cloth to suitcases and bags will clean and polish them.

A large piece of blotting paper placed on the closet floor will absorb moisture from wet rubbers that may be placed in closet.

Scorch on cotton or linen may be removed with soap and water. Wet the spot with water and expose to the sun for a day or longer if necessary. The scorch disappears more rapidly if the material is moistened first.

If your garden peas get too hard for serving in the regular way, cook them until tender, press through a sieve and use the pulp in soup.

If you wish to boil a cracked egg place a little vinegar in the water in which it is boiled. This will keep the egg from seeping through the crack in the shell.

If you want your glassware to sparkle, add a little lemon juice to the water in which it is rinsed.

To make white curtains ecru dip in a solution made by boiling one tablespoon of black tea in one quart of water. Strain solution before using.

© Associated Newspapers.—WNU Service.

## GROWING TO MANHOOD

Men never grow up into manhood as an acorn grows into an oak tree. Men come to it by rebirths in every faculty, again, and again, and again.



THE CHOICE OF EXPERTS

★ Like Mrs. Ryerson, 300 times baking award winner, experts take no chances. They choose CLABBER GIRL!

ONLY 10¢  
Your Greater Mix. H.  
**CLABBER GIRL**  
Baking Powder



## THE SURF CALLS!

Come now to our cool shore for finest surf and sun bathing, dancing and gay social life, deep-sea fishing, two 18-hole golf courses, tennis, riding, and skeet.



# Gallant Gentleman



• IN UNITED TRIBUTE TO REAR-ADMIRAL RICHARD EVELYN BYRD, U. S. N. (Ret.), six hundred members of American industrial and scientific groups met at a dinner on June 5th. They presented to Admiral Byrd a gold medal inscribed "American Industry's Tribute."

On the reverse side, this medal commemorates the silent courage of an heroic leader who kept alone "a six months vigil for meteorological observation at the world's southernmost outpost. Before the middle of the long Antarctic night he was stricken desperately ill from the poisonous fumes of a faulty oil stove. Survival seemed impossible. He deliberately chose to die rather than tap out an S. O. S. on his radio. In fact, he squandered his strength and lessened his chance for survival by painfully hand-cranking his radio

to keep his schedule and report—"All's Well"—to Little America, lest his silence cause his comrades to risk their lives coming to his rescue in the darkness. For months of the bitterest average cold ever endured, he hung precariously on the edge of the abyss. Untold suffering did not compel him to alter his decision. By a miracle he was spared."

In 22 branches of scientific knowledge the world is richer because Byrd and his comrades adventured into the Antarctic. But far beyond this the world is enriched by the character of these courageous men... led by a man who silently challenged death in one of the great deeds of all time... It is in enduring recognition of such rare leadership that the medal presented to him is inscribed "Dick Byrd—Gallant Gentleman."

Phillips Delicious Soups, Tomato Juice and Canned Vegetables were carried in the commissariat of both Byrd Expeditions to the Antarctic.



## HOUSEKEEPING AT THE WORLD'S SOUTHERNMOST OUTPOST

In this tiny hut, buried under ice-fields, Admiral Byrd lived alone through months of darkness, with the temperature 80 below zero.

We are frankly proud to point out Phillips Delicious Foods among the vital supplies in this hut. When every ounce of food carried has to justify its

weight... when morale and life itself depend upon the quality of the food... supplies are selected only after the most rigorous tests. By such tests Phillips Delicious Foods were approved and carried on both the 1928 and 1933 Byrd Antarctic Expeditions. They have never had endorsement that pleased us more.

**PHILLIPS** Delicious **FOODS**