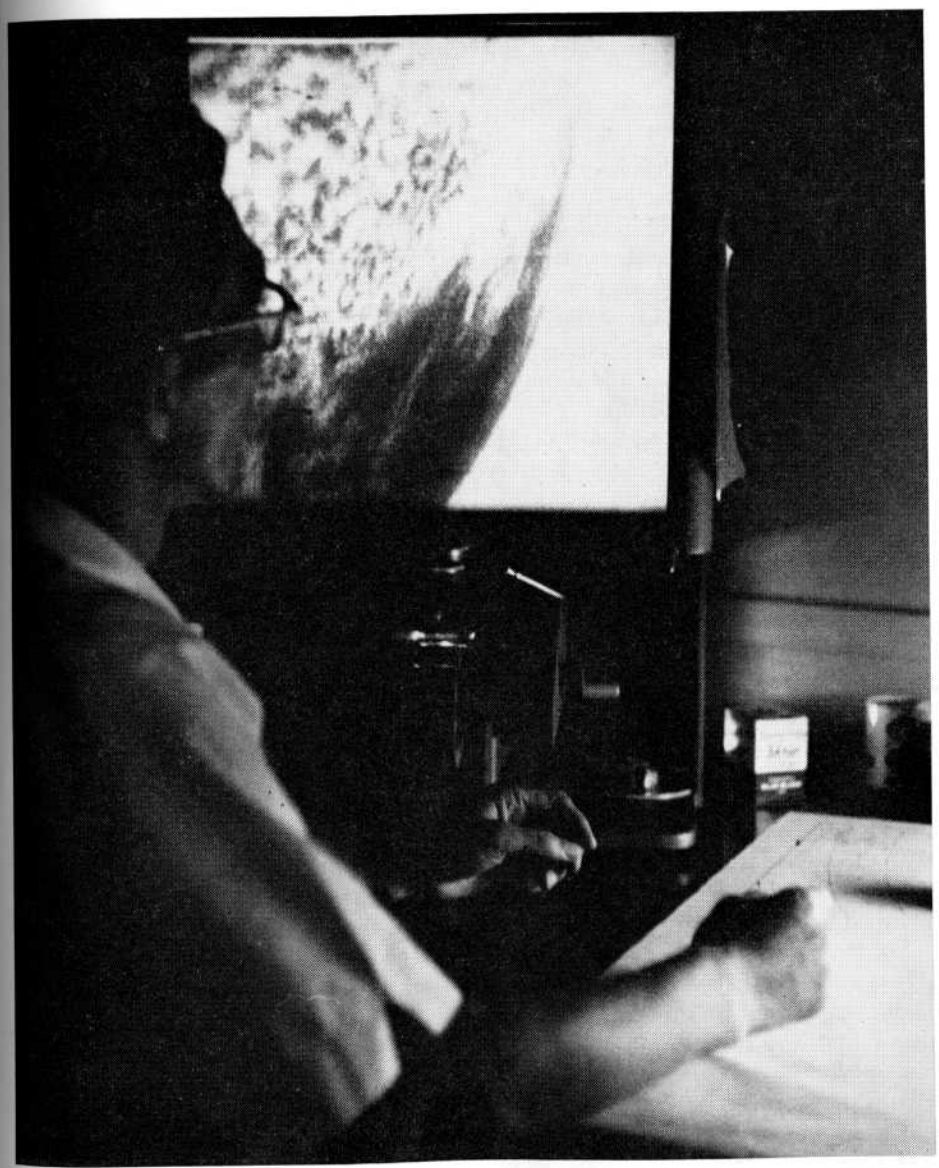
feet on the ground

Head in the Clouds



TIROS satellite photographs of cloud patterns are being studied by Dr. Yoshikazu Sasaki in an effort to understand severe weather behavior by examination of the area surrounding the storms. He is also experimenting with the use of a electronic computer in determining weather patterns.

In Oklahoma everyone is his own weatherman—a self-appointed expert on what crazy turn the weather is going to take next. To be on the safe side, most people also check the professional weatherman's forecast. If the professional happens to be right, it is chalked up to guesswork. Ah, but if he's wrong, his amateur competition never forgets.

On the amateur level, weather forecasting is intuition; on the scientific level, it's meteorology. Technically meteorology is the study of the atmosphere and its phenomena, but practically the men in this field are striving to refute Will Rogers' famous taunt that "everyone talks about the weather, but nobody ever does anything about it." The meteorologists are not only trying to outguess the weather, but to control it, to modify it, to discover the reasons why and how.

The importance of weather in every man's life is a fact that is becoming increasingly evident to the public at large. When Col. John Glenn suited up time after time for his orbital flight, it was the weather that made all man's technical triumphs inoperable. When a businessman plans a trip, he checks the forecast before deciding on mode of transportation. The farmer planting his crops is completely at the mercy of the weather. Man may have his feet on the ground, but he lives in the atmosphere.

For instance, just take the subjects making up the news on the front page of the evening paper: radio and television communications, radar detection, military operations, water supply, soil erosion, forest fires, distribution and growth of plant life, harvesting, food and fuel distribution, busi-

continued

Oklahoma is the world's best laboratory for severe storms

ness, advertising, insurance, allergies, public health, radioactive fallout, recreation.

The University of Oklahoma is highly involved in the science of meteorology in spite of the fact that O.U.'s own program was initiated only two years ago. Actually formal study of meteorology in the United States is itself a relatively young field. Massachusetts Institute of Technology established the first formal curriculum less than 35 years ago. By World War II five universities were offering courses in cooperation with the national defense training programs. Now 20 American universities offer graduate degree programs in meteorology, several more offer the bachelor's degree alone or provide meteorology as part of other study programs.

THOUGH a newcomer among the ranks of the major universities providing instruction and research opportunities in this expanding scientific field, the O.U. program has developed rapidly in a short period and at surprisingly little expense to the taxpayer.

Dr. Walter J. Saucier is the University's first full-time professor of meteorology and project director at the Atmospheric Research Laboratory on North Campus. Under his tutelage students can take work in meteorology at the bachelor's, master's and doctor's levels. Degrees are granted as options in engineering and science. The courses which lead to a bachelor's degree also meet the requirements for professional status in meteorology, and the entire program is recognized academically and professionally throughout the country. Currently students are enrolled in each of the three curriculum levels. Early in 1961 the Air Force began assigning qualified personnel as students in the University for both special and degree programs to satisfy a large part of Air Force meteorological training requirements.

A real coup for the University and its meteorology program was the selection of O.U. as the site of the recent national meeting of the American Meteorological Society—a biannual Conference on Severe Storms. The conference attracted nearly 300 scientists from Canada, Europe and the United States who are concentrating on the problem of severe storms.

For the layman unfamiliar with terms like adiabatic lapse rate or stratocumulus, the conference had little meaning. But the work of these 300 men in solving the riddles of the earth's weather patterns has great meaning for specialist and layman alike. These are the men who must explain how a man can stand knee-deep in mud from a day of rain and sneeze from the clouds of dust blowing around him. These are the men who have transformed tornado tracking from a panic-button operation into a highly skilled, highly accurate job that saves countless lives.

Each advance in technology involving the natural environment increases the need for knowledge of the atmosphere and its influence on that environment. In the face of today's lightning-like technical advancement, it is no wonder that the emphasis on meteorological education and research has increased so rapidly.

To understand the intricacies of the field, however, takes more than a television-viewer's knowledge of weather forecasting. A trained meteorologist has a background similar to a physicist, an engineer or a chemist. He must study the causes of wind directions and patterns. He must learn to study the atmosphere through the electronic aids of radio and radar. He must study the chemical processes involved in the effect of sunlight on various levels of the atmosphere. He does not become an expert in all phases of science and engineering, but he does have a background familiarity with these areas, and he works closely with experts in these fields to correlate available knowledge of the atmosphere.

For those who tend to scoff at meteorology as a science, the weathermen can point to one significant fact: the atmosphere was man's first scientific laboratory. In that atmosphere early scientists observed nearly all the phenomena studied today in the physical sciences. Because this business of forecasting the weather looks so simple on television, it is sometimes regarded as a part of "show business." But meteorology, even for television, is more than drawing lines for cold and warm fronts and tracing circles for highs and lows, reading a thermometer, a barometer and a rain gauge.

There is a distinct intellectual challenge in the study of weather. Its very unpredictability opens it to prediction. There is room for unlimited research, yet meteorology is relatively neglected as a profession.

Slowly meteorology is emerging from the cloud that labels weather as an unfathomable act of God. There is a new demand for "applied" meteorology for business, industry, agriculture and national defense. True, knowledge of the atmosphere is incomplete, but the value of applying the facts that are known has been placed at more than a billion dollars a year. Business, industry and agriculture are learning to adjust their activities to utilize their dependence on the weather rather than fighting this reliance.

Meteorologists will try almost anything. They even talk of modifying the weather. Sometimes they succeed in doing just that. Modification is the infant phase of the profession, but one with enormous potential. It can mean making rain or stopping it or deflecting damaging storms — actually changing the weather to suit an activity instead of changing the activity to suit the weather.

Some of the phases of meteorology are highly advanced; some are in the infant stages, and O.U. is involved in them all. The University maintains a fine program of instruction in the field, but there is also a research phase on the campus. At the Atmospheric Research Laboratory on the North Campus, research occupies seven scientists, each with advanced degrees in meteorology. The program is administered through the O.U. Research Institute and is maintained on a current annual budget of $120,000 sponsored by federal agencies.

OKLAHOMA is a natural location for such a laboratory. As Dr. Saucier says, "Nature has provided Oklahoma with the world's best laboratory for observing and studying severe storms." Work in this area, learning to understand the nature and causes of such storms as thunderstorms, hail, tornadoes, and downpours, can only lead to better forecasts and more adequate warning systems. In the physical sense such research is also the key to improved flood systems and in the future, perhaps, to the actual control of storms.

Only during the last 10 to 15 years have scientists confirmed that severe storms do

not just drop from nowhere but are part and parcel of specific sets of conditions and broad continental weather patterns. This knowledge has led to the improvement of severe weather warning systems. It has become evident that in order to understand isolated storms, the meteorologists must also understand the area that surrounds the storms. Present forecasting methods take in a much larger area than is practical for such detailed study. Therefore a group of meteorologists is exploring the smaller patterns known as mesoscale.

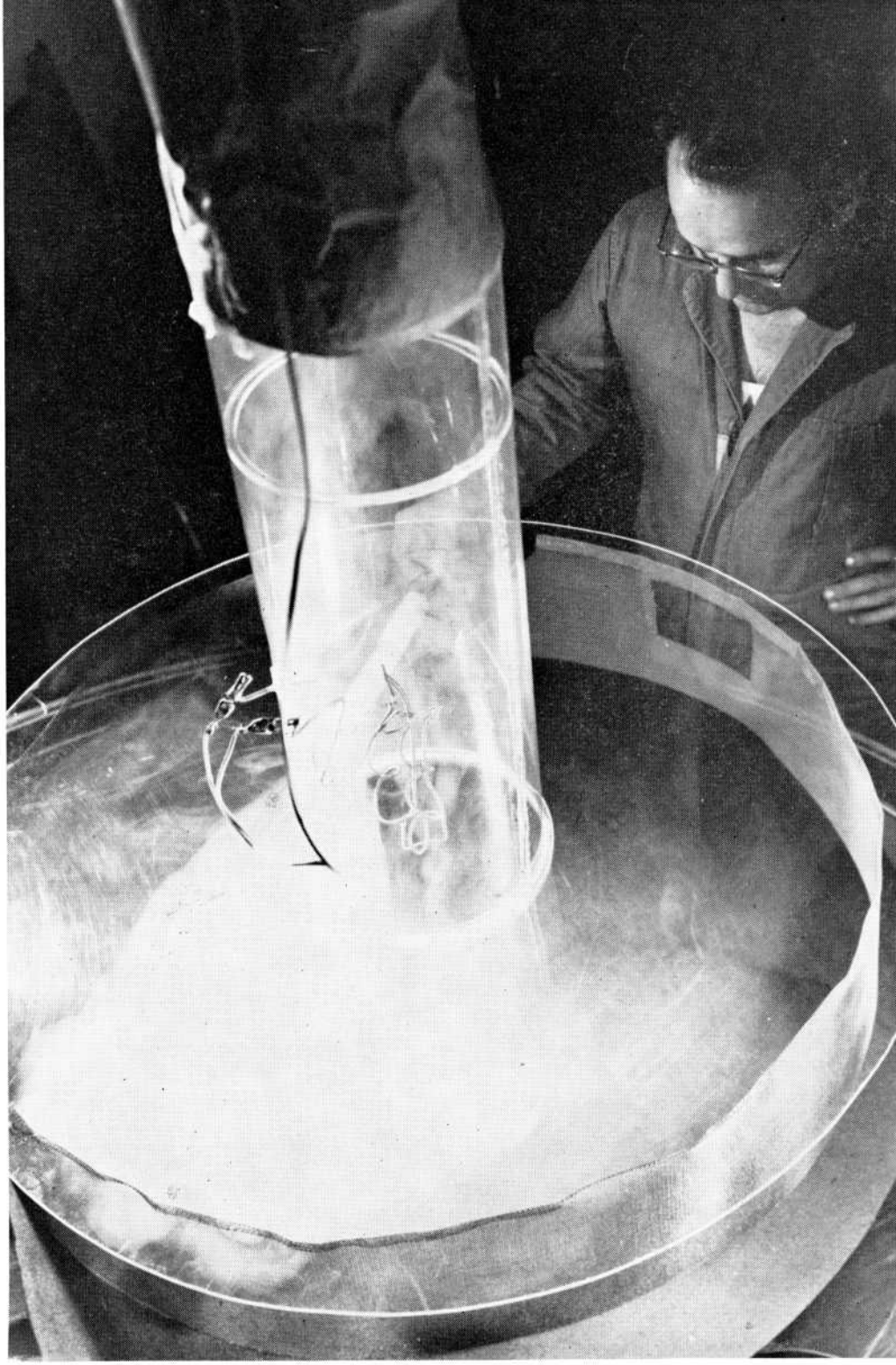
Work on the mesoscale is being carried out at O.U. by Dr. Yoshikazu Sasaki and his assistants. In one phase of their work they utilize TIROS satellite photographs to examine cloud patterns. They are also experimenting with an electronic computer in determining weather patterns.

A PROJECT directed by E. M. Wilkins involves the study of wind circulations in tornadoes. He is examining the effects which the electric field of the earth and the various types of wind systems surrounding the tornado may have on the growth and decay of the storm.

Dr. Saucier is conducting an investigation of the distribution of winds and other weather factors in the stratosphere, the layer between 10 and 20 miles above the earth's surface. Only when scientists all over the world participated in the International Geophysical Year was sufficient observation made of that layer to open it to intensive study. Dr. Saucier is seeking, among other things, to see what effect the stratosphere has on weather patterns at the earth level, including its role in severe storms.

In February an Alumni Development Fund allocation of $4,000 made it possible for the O.U. meteorologists to secure equipment from the federal government to set up a radar system for direct observation of severe storms. The radar will be used to determine wind patterns around the storms by tracking free-floating balloons.

It is spring in Oklahoma—tornado season, signaling the beginning of the spring operations of the National Severe Storms Project in the state. The data gathered by storm battered airplanes, weather bureau and defense department radar and the mass of surface weather stations all over Oklahoma will be utilized by those scientists at the North Campus. They have their heads in the clouds and many of their plans are still in the dream stage. Yet one of these days they will be able to tell exactly what the weather is going to be—and to do something about it.



This device which creates tornadoes on a miniature scale is being used to study wind circulation and to determine the effect of wind systems on the growth and the decay of the twisters.