

prediction is one means of coping with the weather; and the improvement of forecasts, particularly their extension in time, is an important objective of meteorologists the world over. Weather is a global entity. The atmosphere is the "working fluid" of an enormous heat engine driven by the sun. Large and small scale circulation systems in the atmosphere transport heat from the tropics to the polar regions.

One of the principal deficiencies in understanding weather and in its prediction has been the lack of adequate data from the Southern Hemisphere, particularly in the Antarctic and in the vast oceanic regions surrounding it. During the IGY almost 60 stations will be established in the Antarctic and the sub-Antarctic waters. These, combined with other stations in the Southern Hemisphere, will provide adequate meteorological coverage of the Southern Hemisphere for the first time in history.

Both in the Northern and Southern Hemispheres emphasis is being placed on meteorological measurements to heights of approximately 100,000 feet. An extensive chain of stations throughout the world will launch balloon-borne weather instruments. These devices will radio back information on pressure, temperature, humidity, and winds. This information promises to reveal the true three-dimensional structure of the atmosphere which is needed for improved long-range weather prediction as well as for an advance in our knowledge of basic weather patterns.

The atmosphere is responsible for a number of factors crucial to life: oxygen, moisture, insulation against deadly radiation from the sun. No property of the atmosphere, however, is more important than its motion. Winds distribute heat from the Tropics to other regions, transport moisture from the oceans and drop rain on the continents, remove polluted air from the cities and bring in clean air. In a windless world the Tropics would become intolerably hot and the rest of the planet unbearably cold. The parched continents would become dust; cities would suffocate. The general circulation of the atmosphere keeps the air moving rapidly over the globe day in and day out, year in and year out.

One of the major studies in this program has to do with the mass movement of atmosphere between the Tropics and the polar regions and with the circulation of the atmosphere around the world. Five meridional chains of stations will be used. Three of these reach from pole to pole—along the 80° W., 10° E., and 140° E. meridians. These chains will permit the study of major atmospheric circulation patterns and are expected to shed light on the exchange of heat between the Tropics and the poles and the nature of mass movements in the air, including such features as the jet streams.

The Antarctic program will permit us for the first time to prepare daily weather maps of that huge continent. The Antarctic covers some 6 million square miles, about equivalent to the combined areas of the United States and Europe. Sheathed in ice and snow, this continent represents a unique region of cold weather, which is suspected to have a major influence on the world's weather.

OCEANOGRAPHY

The winds and weather of the world play across a surface that is approximately three-fourths water. The currents of the oceans move constantly in a huge circulatory system that vitally affects the