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OF AGRICULTURE

Radio Service

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CHATS WITH THE WEATHER MAN

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ANNOUNCEMENT: Now for a chat with the weather man at the United States Weather Bureau. By this time next year, the world's weather scientists expect to have completed the most remarkable series of weather observations ever undertaken on this old globe of ours. Today we are going to hear something about that undertaking.

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Many of you radio listeners attended a balloon ascension in Switzerland a couple of weeks ago. You stood by and heard a scientist on his take-off for a record-breaking upward plunge toward the stratosphere.

Today Mr. Leroy T. Samuels, of the United States Weather Bureau, tells us about plans for other free balloons, equipped with scientific instruments, to go up, up, on up into the rarer heights of the stratosphere until they burst.

Those balloons will carry no human passengers. But as they rise into the upper air, the self-recording instruments which they do carry will send back radio signals giving the measurements of temperature and air pressure to meteorologists safely seated at receiving sets on the ground. Yes, that's right. Those balloons will carry radio sets and the thermometers and barometers will send back their own records by radio.-----

However, that is getting a little ahead of our story. Those radio meteorographs are just one feature of the world wide observations of the Second International Polar Year, that started last month, and will run until the end of August next year. We are now not only in the last half of the year 1932 and election year, but in the first part of the Second Polar Year, a year that may loom big in the history of weather science.

As some of the older of you may recall, the First Polar Year was just fifty years ago and twelve nations took part in it. The famous Point Barrow and the thrilling Greeley Arctic expeditions were part of our participation in that First Polar Year. That First Polar Year yielded a lot of valuable data about weather conditions in the Arctic and the Antarctic.

During this jubilee year of that First International Polar year in which twelve nations took part, thirty-three countries are taking part in another and more far-reaching program. During the Second Polar Year, meteorologists of all thirty-three nations are taking observations at a large number of stations all over the globe at the same time. These observations include not only work at the regular stations, but observations at a number of special stations, including exploration of many of the blind spots on our weather map, upstairs and down.

Each country taking part in the Second Polar Year takes observations in its own territory. Our meteorologists take a number of special observations at various points in our States, and, of course, special Second Polar Year observations along

our northern weather frontier in Alaska. Canadian meteorologists make the observations at their northern weather outposts. At the same time, the Russian and Scandinavian meteorologists take observations in their Arctic territory.

I guess with cold waves coming down on us from the North in a few weeks now we don't have to be told it is important to know about those Arctic weather conditions. As a matter of fact, however, the interchange of air between the tropics and the poles is responsible in a big way for the circulation of wind currents all over this old globe of ours. Upward currents of air rise higher at the equator than in the Arctic. Cold air flows down from the poles as the hot air rises from the surface in the tropics, loses its heat, and flows poleward.

Mr. Samuels explains that the two main purposes of the observations being made this Second Polar Year are to increase our general knowledge of world meteorology, and more specifically to get as many simultaneous observations as possible over vast areas of the earth to study the relationships between weather conditions in the Polar regions and the weather conditions in our lower latitudes.

Of course, that involves not only what happens here at the surface, but at the other levels on up to ten miles or so above us in the stratosphere where meteorological conditions are radically different from those at the ground level. In the stratosphere, for example, the temperature averages about 70 degrees below zero and remains practically constant with increase in height, at least, to the greatest heights reached by meteorological instruments, viz., 20 miles. Also, clouds rarely occur in the stratosphere and the wind, contrary to the belief of many people, is often very light.

Every day, at five points in the United States, pilots in airplanes equipped with weather instruments make observations of the upper air for use by our regular weather forecasts. This Second Polar Year similar observations are also being made by airplane twice a day at Fairbanks, Alaska. At those six points, we get a complete record of temperature, humidity and pressure conditions at all levels up to about 4 miles. Mr. Samuels says airplanes on the average get records about twice as high with much greater regularity and in less than half the time that it takes to get upper-air records by the use of box kites, which used to be our old standby for such work.

In order to get information about the temperature and pressure higher up than the levels regularly reached by kites and airplanes, the Weather ^{Bureau} makes use of balloons carrying automatic temperature and pressure recording devices. In those devices, the expansion and contraction of a piece of metal with changes in temperature actuates a pen or marker which traces the up and downs of temperature on a sheet of paper moved under the pen by clock work.

Those balloons usually go on up into the stratosphere before they burst. Parachutes bring down the instruments and the records, which bear a tag asking the finder to return them to the Weather Bureau. Mr. Samuels informs us that about ninety per cent of the instruments and records used that way in the United States are returned to the Weather Bureau stations.

That system works well in populated countries, but in the rough Arctic where the Weather Bureau aims to collect a lot of upper-air records this Second Polar Year, the chances of getting back the records would be slim.

To meet the need for temperature and pressure measurements in the Arctic at heights beyond where the airplanes climb, the International Polar Year Commission, has supplied each of the countries with a number of radio meteorographs to be used with sounding balloons.

In these newer type instruments, the changes in temperature and pressure cause the bending of strips of metal which move a marker on much the same principle as the old clockwork affairs. Instead of making marks on smoked paper, however, a finger of metal is moved across contact points of a compact radio sending apparatus. As the marker touches the different points signals corresponding to the temperature and pressure changes are broadcast to be picked up by the meteorologist on the ground.

The United States Weather Bureau has recently received 13 such radio meteorographs from the Polar Year Commission and Canada a like number. Our instrument men are now testing and adjusting the signals to the temperature and pressure changes. As soon as the instruments can be accurately calibrated, they will be sent to Fairbanks, Alaska, where a balloon carrying one of them will be released on the same day each month that similar radio meteorographs will be sent up into the stratosphere by other nations taking part in this survey of weather conditions aloft.

At the same time, the older type sounding balloons will be released at Dallas, Texas, Ellendale, North Dakota, and Omaha, Nebraska. It may be days or even weeks before some of those temperature and pressure records are mailed in to the Weather Bureau Stations, but with the new type radio instrument, the listening meteorologist will get the measurements practically the instant they are made. As the balloon shoots upward, he will chart the different temperatures and pressures through which that balloon passes and from these data the corresponding heights will be computed.

But, as we said, this is only one small feature of a world-wide investigation. Wind direction and movement aloft will, of course, be obtained by means of pilot balloons. There will also be photographic measurements of the aurora, and observations of peculiar cloud formations in the upper air. But we will have to get Mr. Samuels to tell you about some of those other features of the Second Polar Year some other time.

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ANNOUNCEMENT: You have just listened to a chat with the weather man, about one feature of the cooperation of the United States Weather Bureau in the meteorological investigations of the Second Polar Year. Two weeks from today, we hope to hear some more about that work.

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National Oceanic and Atmospheric Administration

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