freezing, and often even below zero. On mixing with snow they freeze as globules of cloudy ice. Getting into descending currents, out of the uprushes they fall into the rain levels, and take on a clear layer of ice from contacts with rising drops; then again the growing hail is tossed on high, to receive another coat of snowy ice. This process is sometimes kept up until on rare occasions stones with 25 layers and as big as baseballs result, such as those falling at Annapolis, Md., June 22, 1915.

When the upward wind gravity is permitted to work its will, then the hailstones fall to the earth, seldom doing greater damage than to cut up growing things, because the stones are small. But sometimes the great stones are a serious danger; they play havoc with crops, even to the point of complete ruin, destroy light structures and glass everywhere, and even kill cattle in the fields.

TIMING THUNDERSTORM'S ARRIVAL

When a thunderstorm is seen in the distance directly approaching, then the moment when the observer will feel the first gust of cool wind and the first big splashes of rain may be estimated quite closely. He must accept two averages, the one the height of the thundercloud base as one mile, the other the speed of travel as 25 miles an hour. These are close enough for ordinary purposes.

Hold a rule or pencil in the right hand, supported vertically between the thumb nail and the bend of the forefinger. Holding the pencil at full arm's length, keeping head erect, get someone to measure with a yardstick the distance from the eye to the pencil, which, with most adults, is between 20 and 24 inches.

When the thunderstorm comes into view hold out the pencil, and shift it up and down until the distance from itsupper end to the thumbnail covers the space between the base of the cloud and the horizon line, which, if the actual horizon is concealed, as it usually is in rolling or hilly country, may be

taken as a point levelwith the eye.

Accepting the height of the base of the thundercloud as one mile, its distance in miles is the ratio of the height-of-pencil measurement to the eye-to-pencil distance. If, for example, the height-of-pencil measurement is 3 inches and the eye-to-pencil distance 24 inches, the ratio is 3 to 24 or 1 to 8, and the distance of the approaching storm is 8 miles. If the height-of-pencil distance is 2 inches, the ratio is 1 to 12, the distance of the storm being 12 miles.

Accepting the average speed of the approaching storm as 25 miles an hour, if it is 8 miles away it is due to arrive in 20 minutes; if 12 miles away, in about half an hour. Of course, these results are only roughly approximate. But in any case, the simple method will tell whether the storm is close at hand or a long way off.

TIMING DISTANT THUNDERSTORMS

Thunderheads are very often seen so far away that their flat bases are hidden by intervening elevations or are actually below the horizon. In such cases, the distance of the storm and, if it is approaching, the time of its arrival, may be closely estimated by the use of a measure or pencil, in the same manner as that employed where the cloud base is used. The pencil or measure is held upright in the bend of the forefinger, supported firmly by the thumb-nail. The arm is held at full length and the distance measured from the eye to the pencil. The pencil is shifted up and down until the distance from pencil end to thumbnail covers the space between the level of the eye, taken as the horizon, and the summit of the tallest turreted cloud which is assumed to be four miles above the ground, instead of the one mile employed when the base of the cloud is considered.

The ratio of the height-of-pencil measurement to the eye-to-pencil distance determines the distance of the storm.

Thus, assuming the height-of-pencil measurement to be 3 inches, and the