

It continued almost uninterrupted and *Cb* clouds advanced over the airfield from a southerly direction. Large drops of rain showers commenced at 1532 IST and were followed by steady rain within a couple of minutes. Mixed with rain, small pieces of hail of $\frac{1}{2}$ —1 cm in diameter were noticed. Hail commenced with a southerly squall which reached a maximum speed of 50 kmph. The hail stones were roughly spherical with a small core of white ice and a comparatively larger coating of clear ice. This shower of hail lasted 2 minutes and was followed, after a brief interval, by a shower of larger size, between 1 to $2\frac{3}{4}$ cm in diameter, which lasted for about 2 minutes and brought down the largest quantity of ice during the hailstorms. Shortly afterwards, the hailstones of this size ceased falling, but after a brief interval very much larger ones of diameter 4 to 5 cm but fewer and further apart (distances of 1 to 3 yards apart) began hitting the ground and lasted nearly for $\frac{1}{2}$ a minute. Between each shower of hail there was a brief interval. Rain was, however, continuous throughout. The storm passed over the station in about 15 minutes; but isolated cells of *Cb* continued to persist over the station till 2200 IST and gusty winds from NW prevailed between 1845 and 2230 IST.

551.578.7

AN UNUSUAL HAILSTORM AT
BAMRAULI ON 7 FEBRUARY 1961

From the early morning of 7 February 1961 the sky was overcast at Bamrauli with low stratus clouds with base between 100 to 180 metres and occasional light drizzle between 0615 and 0912 IST. The cloud base began to lift gradually from 1000 IST when the cloud also began to break up. At 1400 IST there was only 3 octas of *Cu* with base at 600 meters and about half an hour later *Cb* began to build up rapidly to the south of the airfield. By 1500 IST 3 octas of *Cb* had developed and thunder was heard.

A total rainfall of 7.7 mm including melted hail, was recorded during the storm. The humidity rose from 52 to 88 per cent and the temperature dropped from 22.5° to 17.0°C during the storm. The station barograph recorded a sharp dip during the passage of the hailstorm. The fall was hardly 1 mb. The lowest pressure was recorded at the time of commencement of the storm, the fall of pressure being gradual at first, *i.e.*, from 1500 IST, when *Cb* began developing, till 1525 IST and more rapid later, *i.e.*, between 1525 and 1535 IST. The rise of pressure was much more rapid than the fall preceding the storm. Relevant portions of the autographic records are reproduced in Fig. 1.

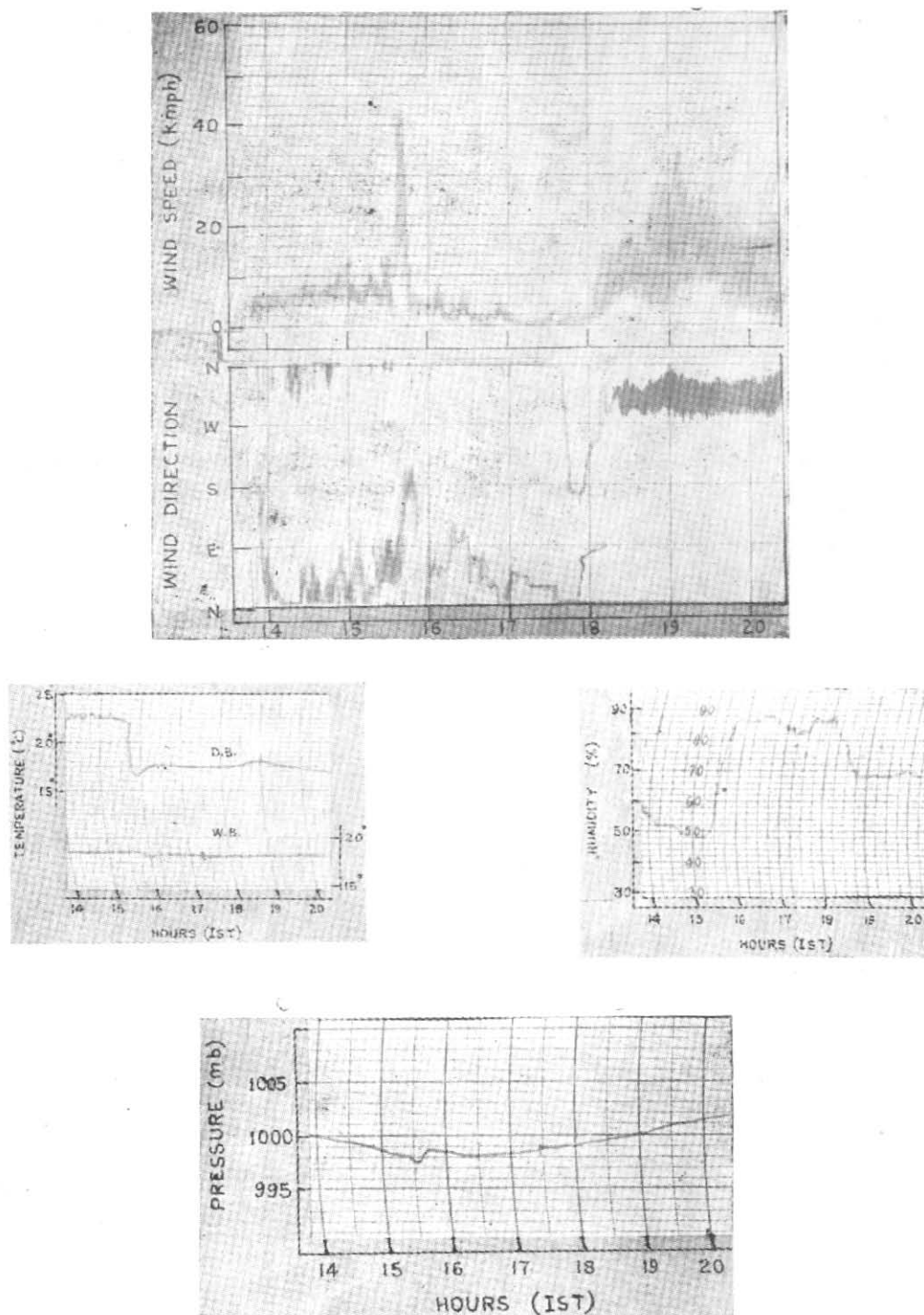


Fig. 1. Relevant portions of autographic records of Bamrauli — 7 February 1961



Fig. 2. Side view of the hailstones of the third shower of hail



Fig. 3. Broadest cross-section of the hailstones of the third shower

A peculiar feature of the hailstorm was the size and shape of the hailstones of the third shower of hail. These hailstones were roughly oval in their broadest cross-section, a little concave on one side and bulging on the opposite side. A picture made on the spot by the artist attached to the Civil Aviation Training Centre is reproduced (Fig. 2). It is seen that these hailstones were actually formed by a clusters of smaller hails of the first shower, held together by accretion of ice. It would appear that these clusters of small hails on reaching the super-cooled dense water cloud coagulated and were caught up in updrafts and congealed at great heights. The concave surface was apparently facing the earth during the upward travel in the updrafts. These hailstones were the last to reach the ground during the hailstorm. The boundary of their broadest cross-section (Fig. 3) was zig-zag and not smooth. The largest of these hailstones picked up near the meteorological office weighed 12 gm and measured 4 cm in diameter. Some picked up near C.A.T.C. are said to have weighed as much as 3 tolas (35 gm).

Agarwala (1950) has given an excellent summary of the size and shape of hailstones in India but hailstones of this shape have not been referred. The nearest approach to this shape are the circular lens shaped stones mentioned by him. But the peculiar feature of these hailstones is that each stone was composed of several smaller stones with core of white ice, set together as in a stone-set jewel to form a single piece.

The hailstorm covered an area of approximately 3 to 4 square miles and caused

considerable damage to the standing crops of winter vegetables in the neighbourhood.

S. GASPAR

*Meteorological Office,
Bamrauli, Allahabad
March 23, 1961.*

REFERENCE

- Agarwala, K. S. 1950 *Indian J. Met. Geophys.*,
1, 4, p. 309.