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The supposed meteorite fall at Karlstad ("Carlstadt") in Sweden, 1822

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In their list of meteorite falls Prior & Hey (1953) mention as "doubtful" a case reported to have occurred at "Carlstadt" (Karlstad) in Sweden on Sept. 10, 1822. The notice goes back to a paper by Chladni (1823), who in turn had his information from an Austrian publication which he quoted as "Jurende's meteorologische Beilage zu den Mitteilungen der k.k. mährisch-schlesischen Gesellschaft zu Beförderung des Ackerbaues, etc." According to this source the phenomenon occurred at 10.30 p.m. and consisted of an earthquake, a terrific thunder, "peculiar" strokes of lightning, and shooting stars of "astonishing" magnitude; after the night, fallen stones had been found at several places. Chladni felt doubts about the correctness of this report, noting that its original source was not indicated, and expressed the hope that naturalists in Sweden would investigate the matter.

Professor F. E. Wickman has called my attention to this case. If really, as reported, meteorites had been recovered, a search for them ought to be made in local and other collections; if, on the other hand, the original observations did not indicate a meteorite fall, it was about time for the occurrence to be definitely struck from the list of such phenomena.

In the scientific literature of Sweden there is no reference, confirmative or correcting, to the description quoted by Chladni. This is remarkable, as A. E. Nordenskiöld, among whose manifold scientific activities the study of meteors and meteorites occupied a very prominent place, was undoubtedly familiar with Chladni's writings. Apparently Nordenskiöld knew that the report did not refer to a meteor.

It is, instead, among recorded earthquakes that one finds a notice which evidently refers to the phenomenon in question. In his yearly report to the Swedish Academy of Sciences, concerning chemistry and physics during 1822, Berzelius (1823) also presents a list of the earthquakes observed in various countries. One of the two reports from Sweden runs: "On Sept. 10, at Carlstad, a light shock, accompanied by a rolling thunder" (Berzelius, 1823, p. 229, transl.). As in the other cases of earthquakes reports, Berzelius does not state the source of his information. It is known from one of his published letters that he spent the day in question at a great distance from Karlstad and thus could not have himself witnessed the phenomenon. On the other hand, with his position and scientific authority he could be counted upon to receive reliable information on such matters. Obviously, therefore, his notice on the subject must be regarded as a strong indication that what occurred at Karlstad was actually an earth tremor and accompanying sound phenomenon, and no meteor explosion. Yet the latter alternative is not wholly excluded through Berze-

lius's note. How similar to an earthquake the effects of a meteor explosion may be is illustrated by numerous cases. A remarkable example gave the large "Luleå meteor" of 1877, which exploded near Luleå in northern Sweden. (No fragments of it were ever found.) According to reliable reports collected by Nordenskiöld (1878) the effects of the air blast at Luleå (at a probable distance of at least about 40 km from the point of explosion) were that the houses shook "as from an earthquake", some window-panes were blown in, fragments of mortar and brick fell from chimneys, and half-open doors were flung shut or wide open. It was desirable, therefore, to obtain more data on the Karlstad phenomenon than are contained in Berzelius's brief note. Today, local newspapers would seem a promising source of information. The only one published at Karlstad in 1822, the weekly "Carlstads Tidning", proved disappointing: the only local news in its issue next after Sept. 10 (Sept. 14) are some official announcements. This absence of any reference to the occurrence indicates that it probably was less remarkable than described in the report quoted by Chladni, but is not conclusive. However, a confirmation of Berzelius's statement is obtained from an interesting source. At the time there was in force an ordinance in which the clergy of the country were instructed to include with their yearly population statistics also reports on any happenings out of the ordinary that had been noted in their territorial parishes during the year. Sidenbladh (1908) had the good idea of exploiting these unpublished reports, also with regard to various natural phenomena. No meteor was observed in 1822, which is a strong argument against the meteoric interpretation of the Karlstad phenomenon, since a meteor of sufficient magnitude to produce such effects ought to have been noted over a wide extent of country. Furthermore, from "Dals Södra Prosteri", a district situated about 90 to 115 km SW of Karlstad, there are several reports that an earth tremor was felt on Sept. 10, "late in the evening."

One can conclude, then, that the phenomenon observed at Karlstad was actually a light earth shock, such as occur occasionally in this part of Sweden, although in this case with a remarkably strong accompanying sound. Apparently the other details reported, including the fall of stones, were products of somebody's too lively imagination.

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