

Geology. — *The Meteorite of Ellemeet* (after that of Uden in 1840, and that of Blauwkapel in 1843, the third in the Netherlands). By W. NIEUWENKAMP. (Communicated by Prof. L. RUTTEN.)

(Communicated at the meeting of June 25, 1927).

Whit a loud noise, so that horses and cows took fright, this meteorite fell down in a meadow near Ellemeet, in the island of Schouwen (Holland) on the 28th of August 1925 about 11³⁰ in the morning. The only eye-witness describes the phenomenon as "a golden egg with a golden arrow", and asserts to have seen a thin cloud of smoke, 2 m. in length, accompanying the stone. The stone fell almost vertically, slightly from the south, and penetrated into the sods to a depth of about $\frac{1}{2}$ m., according to the written reports sent by Mr. A. P. VAN DER WEIJDE and Mrs. M. WOLFERT of Ellemeet, to the Meteorological Institute at de Bilt, and to a communication in the "Terneuzensche Courant" of 4 Sept. 1925. This information was afterwards followed by three letters from Mr. W. L. VAN DER LINDE, Headmaster in a neighbouring village. He informed us that about 11 o'clock on the same day, landlabourers heard three bodies coming from the northwest with a whistling, howling sound, as of projectiles flying past, and falling down with a dull thud. Now it is a fact that $1\frac{1}{2}$ —2 km. northwest of the spot where the first stone was found, a second stone had come down. This was of a dull, grey colour, and weighed about $\frac{1}{2}$ kg. It had gone into the ground at an angle of about 70° to a depth of about 40 cm. When this piece had been dug up, it was left exposed to the action of weather and wind, and has almost completely been pulverized.

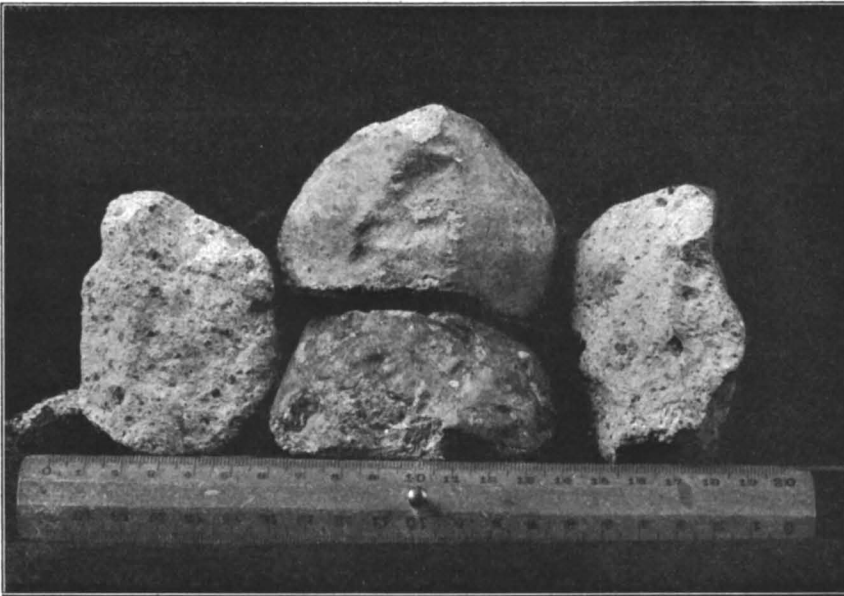
The data concerning these two stones do not quite agree, as the second stone came down to the north-west of the first, and moreover, came from a northwestern direction. One might therefore have expected the first stone also to have come from the north-west. And as stated this stone came from the south. Besides, there is also a difference of half an hour in the time-data.

A third stone was not found.

The first stone has been sent to the Meteorological Institute at De Bilt. While being dug up the stone broke into five pieces weighing about 970 grms. (presumably some of the material had already been lost). The investigation brought on another loss of material, so that 4 of them now weigh 269, 239, 208, and 177 grms. A few smaller fragments are still left, weighing together circa 25 grms. Total 918 grms.

The specific weight of the stone is estimated at 3.41. For this determination the first fragment was weighed under water, after the air had been removed from it by means of an airpump. The form of the stone

must have been approximately spherical (diameter 10 cm.), so far as could be ascertained by fitting the fragments together. On one side the stone is rather smooth, on the other side it is blebby and pitted with irregular "thumb-marks". The crust is dull black, a bit shiny where larger crystals are fused. Fine points of magnetite, which mineral apparently yields but slowly to the corrosion, are sticking out of the crust. A close network of fine suture-like cracks is seen on a large portion of the surface of the crust (meshes from 2 to 5 square mm.).



Something of it can be seen on the top-fragment in the figure. The crust is thin (about 0.1 mm.).

The structure is tuff-like, larger crystals of Hypersthene and a few grains of Olivine are lying in a matrix of Pyroxene-splinters. This matrix is easily friable between thumb and finger.

Veins, Chondres and metallic iron are lacking.

Under the microscope we observed in the slide a very large Olivine-crystal (largest dimensions 1 cm.) with some smaller ones, distinguished by the absence of cleavage and by high double refraction. The axial angle was 86° , optical character negative. Dispersion: red smaller than violet. It contains numerous inclusions of brown glass and grains of ore, the latter being mostly arranged along planes. A systematic position of these planes could not be indicated. I was also able to identify macroscopically a few brown Olivine-crystals, which gelatinized also with hydrochlorid acid. Many other larger crystals, which might be taken for Olivine on account of their green transparency, proved, on closer inspection to consist of rhombic Pyroxene. The Pyroxene-crystals present a great variety

exteriorly. Some of them are very dark, probably by numerous inclusions, a large number of which could be recognized under the microscope (again arranged in irregular planes). Others have the appearance of magnetite, as to their colour; it may be they are enveloped by a thin layer of it.

The axial angle of the pyroxenes was estimated at 60—65°, optical character negative.

Furthermore, granules of magnetite and chromite could readily be identified, the latter being brownish red, transparent and isotropic, the former being strongly attracted by a magnet.

Light yellow granules easily soluble in hydrochloric acid, were considered to be pyrrhotite. Some grains were not or only slightly magnetic.

Feldspar was not found.

Prof. N. SCHOORL was so kind as to have determined the chemical composition in the pharmaceutical laboratory:

	Weight %	Molecular %
SiO ₂	53.63	48.6
Cr ₂ O ₃	1.82	0.7
FeO	18.95	14.3
MgO	25.65	34.8
MnO	1.35	1.0
S	0.42	0.7.

It is remarkable that this composition demonstrates that Olivine is practically absent, although in the slide it was found in the larger crystals, and in rather large quantities. Mr. G. T. PRIOR of London to whom I sent a fragment of the stone, also detected some Olivine, little though it may be, in a slide cut from the stone. In 3 microscopical sections of two granules of only a few grammes Mr. A. LACROIX of Paris also observed several Olivine grains and considered the resemblance with Roda complete. The fact that the analysis shows the absence of Olivine, would then be accounted for by an inhomogeneity similar to that found by A. LACROIX of Roda ¹⁾, which led him to the supposition that larger crystals of Pyroxene and Olivine had been consolidated into a breccia. A difference with Roda is the total absence of feldspar, which occurs in Roda, in small quantity.

At any rate in the Brezina-system the Ellemeet belongs to the Rodite, defined as Achondrite, consisting of Rhombic Pyroxene with Olivine, breccia-like. Also in the new nomenclature of A. LACROIX it will be classed under the same group, although according to his definition the Olivine must have been identified under the microscope as well as by the chemical analysis; there is, however, no reason to suppose that a second chemical analysis made of a fragment in which the Olivine has been shown under the microscope, should not demonstrate its presence in the same fragment.

¹⁾ La Météorite de Roda. Note de A. LACROIX. Comptes Rendus de l'Académie des Sciences Paris. 180, 1925, p. 89.