

The Tauq, 'Iraq, meteorite.

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CIRCUMSTANCES OF THE FALL (W.A.M.)

IN December 1933 Major W. A. Pover, who was then 'Iraq Public Works Department Executive Engineer of the Mosul and Kirkuk Liwas, showed the writer a portion of a meteoritic stone. This had been in his office doing duty as a paper-weight since it was brought to him by two of his men shortly after its fall.

At that time Major Pover was in camp, supervising the erection of the permanent steel road bridge that spans the river valley some five kilometres upstream of Tauq village. His men told him that the meteorite fell in the middle of the night; it was likened by those who saw it to the moon falling, and people were awakened by the jolt of its fall. When the morning came, some of his men went out to seek it, and they in fact found it. They described it as about two and a half feet in diameter, and they broke it up with a sledge hammer, when the fragments were eagerly collected by those who happened to be present. A portion they themselves took to Major Pover.

The precise date of the fall Major Pover was unable to recollect, but his impression was that it was probably in August. The building of the Tauq bridge at the time definitely fixed the year as 1929.

The writer discussed the matter with the Chief of Police in Tauq later in 1934. The fall was clearly remembered by certain residents of Tauq, but no even approximate date could be obtained. It was something that had happened in the past, and that was all that they could say. A fragment, perhaps five centimetres in greatest diameter, of what appeared to be the same stone, with rusty patches on it, probably due to wetting and oxidation, was obtained from a resident. This was not taken by the writer at that time, and when later, on August 4, 1935,

an attempt was made to obtain it, it could no longer be found. It was learned earlier, however, that the headman of the hamlet of Tawila,¹ close to where the meteorite actually fell, was still living there. This man, a peasant farmer named, I think, Omaiyr Abu Mutalak, was sought out. He well remembered the occurrence, and on January 27, 1934, took the writer to within half a kilometre of the alleged spot, when the motor-car was stopped by impassable dikes. Since there was then said to be nothing to see at the precise spot and no proof of its being so, this was not actually visited.

The headman stated that he was at Tawila when the meteorite fell 'one morning'. Pressed as to the approximate time, he could give little more exact information, clocks apparently not being much used at Tawila; but it appeared to be well after sunrise, and before noon. He had no precise recollection of the date. The year he could not give, but it was 'at the reaping time of the barley'. Barley is reaped in the Tauq district from about April or May onwards. Some was still standing in the fields round Kirkuk in the middle of July 1934, so that his date for the fall may perhaps be construed as some time between April and August.

He stated that the meteorite made a swishing sound as it fell, and compared it with that made by the passage of a shell; he was possibly familiar with such a noise from the war time, since he was now a middle-aged man of 40 or 50 years. The whole meteorite was originally about the size of a man's head, and it broke into three parts when it hit the ground. It apparently did not go deeply into the ground, though that is alluvial hereabouts.

He claimed that he reached the stone within quite a short time of its fall, a matter of perhaps a quarter of an hour, but owing to his unfamiliarity with the precise measurement of time it was difficult to establish this estimate. Asked whether it was hot when he reached it, he replied, 'By God, I cannot tell a lie, it was not.'

On August 4, 1935, the writer met the Mullah Said Mustafa of the mosque Imam Zain al Abdin, 2 km. north-east of Tauq. The Mullah clearly recollected hearing about the fall of the stone at the time, but could give neither date nor details.

On news of the Tauq meteorite reaching Dr. L. J. Spencer, F.R.S.,

¹ The name Tawila, an Arabic word meaning 'long', is not infrequently used as a topographical name, e.g. of villages, islands, &c., in Arab countries. It is, therefore, preferred to attach to the meteorite the name of Tauq, a larger and much better known village near by, as more characteristic. Tauq is a Turkish word, apparently meaning 'chicken', and there is a movement in Iraq for renaming the village Daquq, which apparently sounds more dignified in Arab ears.

then Keeper of the Mineral Department of the British Museum, he recalled that Captain R. S. Cooke, who had once acted as Honorary Director of the Museum and Antiquities service in Baghdad, had in June 1932 presented to the British Museum a partly crusted fragment of a meteoritic stone. Captain Cooke stated that the stone had been obtained by Mullah Abd al Qadir, Mudir of the Madrasat al 'Ilmiya in Kirkuk. It was reported to have fallen at Kirkuk, in a field between the railway station and the town, one day at 1 p.m. A crash was heard by people working in the field. The only date that Captain Cooke could give was that it was said to have fallen, he believed in April, before the death of Miss Gertrude Bell on July 12, 1926, but whether the fall was in 1925 or 1926 he could not be sure. He said that he first heard of it from a paragraph in the 'Baghdad Times' of 1925 or 1926, but he could not produce this.

Efforts to obtain further information and confirmation of these statements made by Captain Cooke have been without avail. A request for information was sent by Dr. Spencer to the British Embassy in Baghdad. In a reply dated April 11, 1934, Captain V. Holt, the Oriental Secretary, stated that the British Vice-Consul at Kirkuk had been unable to obtain any information concerning the fall of a meteorite there from the local inhabitants, and Mullah Abd al Qadir had no recollection of it. Another query was addressed to Dr. Julius Jordan, Director of Antiquities, Antiquities Department, 'Iraq, but that also elicited no further information.

The writer independently sought out Mullah Abd al Qadir, and found him at Kirkuk on November 11, 1935. He said that Captain Cooke, whom he knew quite well, had come to him one day, probably with the fragment, and asked him if he knew anything about its fall. This, said Abd al Qadir, was the first he had heard of such an occurrence, and he had no more knowledge of the matter now than then. He said he certainly did not give any specimen to Captain Cooke.

The writer wrote to the editor of the 'Iraq Times' newspaper, which is the successor of the 'Baghdad Times', asking if the alleged paragraph about the meteorite in the latter could be found. A reply dated December 6, 1934, stated that one of the clerks had made a search of the files for 1925 and 1926, and also for the summer of 1929, but was unable to find any account of the fall of a meteorite in 'Iraq.

A letter was therefore written to the 'Iraq Times', and published in English in the issue of February 18, 1935, giving the substance of the various accounts detailed above, and asking readers to give any

information they might have on the matter. A condensed version of the letter and request also appeared in Arabic in the Baghdad newspaper 'Al Bilad' on February 19, 1935. Neither of these appeals yielded any germane reply.

Short of some fortunate and adventitious accession of information, the resources of inquiry appear to have been exhausted, and it remains to review the evidence.

The 'Kirkuk' meteorite, apart from the actual fragment, rests solely upon Captain Cooke's statement, none of the details of which it has been possible to verify. The present writer has found no evidence of the fall of a meteorite in Kirkuk, either amongst the inhabitants of the neighbourhood or otherwise. The specimen given by Captain Cooke to the British Museum appears to be indistinguishable from the Tauq meteorite. It seems unlikely that two such similar meteorites should have fallen within three or four years of each other, so near together as Kirkuk and Tawila near Tauq, which are distant only some 24 km. The inference is that only one meteorite fell, the first to be recorded from 'Iraq, and that the alleged Kirkuk meteorite was both wrongly located and dated.

The differences in the three versions of the circumstances of the fall may be ascribed partly to the imperfect recollections of untrained minds describing an unusual event, and perhaps to embroidery added by Major Pover's men who recounted the tale, possibly already at second-hand, 'to give artistic verisimilitude to a bald and unconvincing narrative'. Certain of the statements are mutually contradictory, and do not seem explicable except as above; for instance, the time of the fall, stated to have been in the forenoon and 1 p.m. on the one hand, a fair agreement, and in the middle of the night on the other.

In the writer's view the evidence points to the following presumption, based mainly on the first-hand account of the headman of Tawila, whose evidence seems the most reliable. The other two accounts are at least second- or third-hand.

A stony meteorite about the size of a man's head fell with a swishing sound in open country half a kilometre east of Tawila hamlet in lat. 35° 10' N., long. 44° 20' E., which is 11 km. north-west of the village of Tauq, in 'Iraq. It fell during the day-time, about or before noon, some time in the summer of 1929, between April and August. It did not penetrate deeply into the hard alluvial ground, and it broke into some three pieces as a result of the impact. It was not appreciably hot when it fell.

DESCRIPTION OF THE METEORITE (G.F.C.)

The portion of the Tauq meteorite available for study consists of two fragments (B.M. 1936, 151) fitting together and measuring over all $15\frac{1}{2} \times 11 \times 7$ cm. (fig. 1). The total weight is 1355 grams, the larger

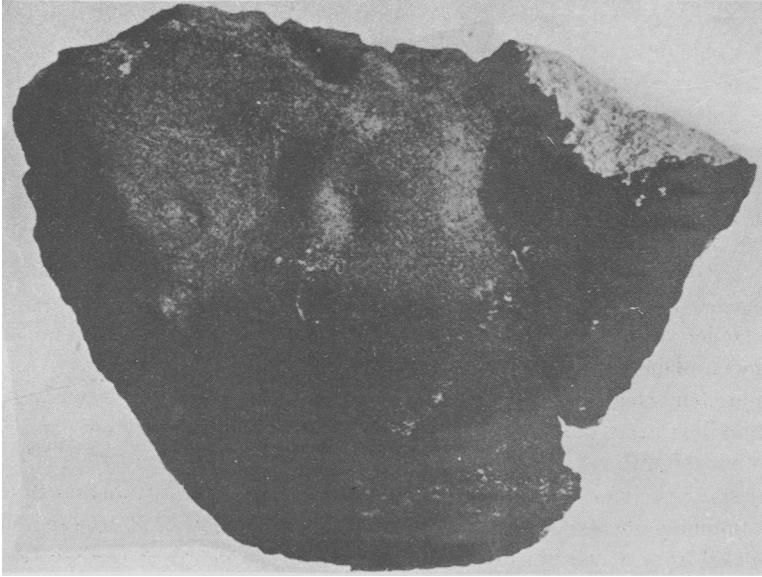


FIG. 1. The Tauq meteorite. $\times \frac{2}{3}$.

fragment weighing 1156 grams. When united along the common fracture the mass exhibits a ridge with the adjacent slopes approximately at right angles and well-defined 'thumb-marks'. The whole of the surface surrounding the ridge (rather more than half that of the united mass) is covered by a black crust having a fairly constant thickness of 1 mm. The rough glassy surface of the crust is interrupted only very occasionally by a smooth area of a few square millimetres where a chondrule makes contact with it on the inside.

The interior of the meteorite is yellowish-grey and a comparatively small amount of troilite and nickel-iron is scattered irregularly through the mass. A number of poorly defined chondrules, 3-8 mm. in diameter, generally darker but occasionally lighter in colour than the main mass are distinguishable in the hand-specimen.

Another 205-gram fragment (B.M. 1932, 1094) of a meteorite said to

have fallen at Kirkuk, 24 km. from Tawila near Tauq, shows a small area of the black crust. It is indistinguishable macroscopically and in thin section from the Tauq material, and almost certainly represents another portion of the same fall. The Tauq meteorite is thought to have weighed about 6–7 kg. and it is not therefore surprising that the Kirkuk specimen cannot be fitted to the Tauq fragments. The petrographic description is based upon sections of both specimens.

The meteorite, a white chondrite, is seen in thin section to be of granular character with fairly numerous chondrules often poorly defined. The minerals present are hypersthene (γ 1.687 \pm 0.002), livine (γ 1.708 \pm 0.002), anorthite, troilite, nickel-iron, and a few minute grains of chromite (?). Of these the olivine and pyroxene in approximately equal proportions are by far the most abundant, forming a granular mass in which the chondrules are embedded. Individual grains rarely exceed 1 mm. in maximum dimension and are generally considerably smaller. Several types of chondrule occur: granular olivine surrounded by a halo of nickel-iron and troilite granules; fine-granular olivine-pyroxene clusters peppered with iron and troilite; sheaf-like pyroxene bundles; nests of irregularly arranged pyroxene fibres; narrow parallel olivine lamellae; olivine and pyroxene rimmed by stumpy olivines; nests of three or four poecilitic pyroxene crystals. Interstitial anorthite commonly shows undulose extinction. The distribution of troilite and nickel-iron, which are distinguishable in the ordinary covered section in oblique surface illumination, has been confirmed by the application of test papers to the sawn surfaces.¹ Troilite is occasionally peripheral to the nickel-iron. The proportion of opaque minerals is estimated at about 3%, and the Mg/Fe ratio is roughly 5/1.

A cross-section of the crust reveals an outer black slaggy skin rarely exceeding 0.1 mm. in width and crenulate on the exterior. Passing inwards there is a tendency for olivine to predominate for the first 0.2 to 0.3 mm., but the remaining and widest band consists of troilite enclosing nickel-iron and occasional grains of olivine. While the crust as a whole is parallel-sided the inner margin is rendered irregular by the penetration of the ferromagnesian crystals of the main mass. This crust is strikingly similar to that of the Rangala meteorite.²

¹ Method of imprints, *Min. Abstr.*, 6-377, 7-110, 556, 557.

² J. A. Dunn, *Rec. Geol. Surv. India*, 1939, vol. 74, p. 267. [M.A. 7-541.]