

The History of the Hoba Meteorite

Part II: The News Spreads...

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In Part I of this article series (Spargo, 2008) we left the Hoba meteorite, no doubt quietly proud of its place in history as the most massive known object to have survived intact its plunge to Earth, in dignified repose in its partially excavated state in the bush in a remote part of a then relatively little-known territory, South-West Africa (Fig. 1). The date was 1921 and only a handful of people, either in South-West Africa or the neighbouring Union of South Africa knew of its existence. As far as can be ascertained no news of this remarkable find had yet penetrated to the outside world.



Fig. 1 Although of unknown date, this is almost certainly the earliest known photograph of the Hoba meteorite.
Source: *Rössing*, October 1988.

***Hobart West, near Grootfontein, Bechuanaland, South West Africa.
Iron.**

A mass estimated at about 40 tons and measuring about $2\frac{1}{2} \times 2\frac{1}{2} \times 8$ metres (verbal communication from Dr. C. Palache, 1922) was found and has not been moved.

Fig. 2 The first intimation in the scientific literature of the meteorite's existence.
Source: Prior, 1923, p.73.

¹ George Thurland Prior (1862-1936) was an eminent British scientist distinguished for his work in mineral chemistry and petrography and on meteorites. He was a member of staff of the British Museum (Natural History) from 1887 until his retirement forty years later in 1927. From 1909 he served as Keeper of Minerals.

The events leading up to this brief – if geographically inaccurate – entry by Prior make fascinating historical reading. In 1922 Prof Charles Palache (Fig. 3), an American on the staff of Harvard University and one of the most eminent crystallographers and mineralogists in the world, visited Southern Africa as a member of the Shaler Memorial Expedition², the principal objective of which was the study of the world-renowned, highly mineralised area north of Pretoria known as the Bushveld Igneous Complex. The expedition, which consisted of the Americans R.A. Daly, C. Palache, and F.C. Wright, together with the Dutch geologist G.A.F. Molengraaff, was guided by the South African geologist A.L. Hall. After a for five week trip through what was then frequently called Sekukuniland, Palache moved on to South-West Africa. As Daly, records in his biographical memoir on Palache ...

[He] was no narrow specialist. He showed his geological skill, for example, during nearly six months in 1922, when he joined the Shaler Memorial Expedition to that wonderland of geological marvels, South Africa. Incidentally, it was during a collecting trip in southwest Africa that he came close to losing his life from an attack of enteric fever, but was saved by a German physician and nurse. His recovery was so rapid and full that he was able to rejoin the main Shaler Memorial party in a prolonged attack on the constitution of the peerless Bushveld Complex of the Transvaal (Daly, 1957, p. 316).



Charles Palache

Fig. 3 Prof Charles Palache (1869-1954).
Source: Daly, 1957.

There is no doubt that in 1922 Palache visited the Hoba area (which as we have noted in Part I of this series was not far from the mining town of Tsumeb), as in a 1927 paper on the copper mineral azurite he states that “the material studied was chiefly a suite of minerals secured at the Tsumeb mine in 1922 ...” (Palache, 1927, 102), while the dated specimens that Palache collected on his visit to the Tsumeb mine, now in the Harvard Mineralogical Museum, indicate that he visited the celebrated mine on 6-7 April 1922 (Francis, 2008). It would therefore have been a relatively simple matter for him to visit the meteorite in early April 1922.

² Nathaniel Southgate Shaler (1841-1906), who served for two years as an artillery officer in the Union Army during the American Civil War, was a student of the great American geologist J.L.R. Agassiz. He became professor of geology at Harvard University in 1887, occupying the chair until his death. (Obituary, *Nature*, 5 July 1906, vol. 74 p. 226).

While it would be natural to assume that Palache actually visited the meteorite in person at that time, this is by no means certain for it is most curious that in his own account of his visit to Tsumeb he makes no mention of the meteorite. Thus unfortunately the question as to whether he actually saw the meteorite or simply reported to Prior what he had heard must remain unanswered.³

Some three years after Palache's visit we have a somewhat vague account in German of the 'first of the visits by experts' to the meteorite, although it is interesting to note that the trench around the meteorite, begun by the redoubtable Mrs Brits just after its discovery, had now been completed ...

At the time of the first of the visits by experts in 1925 [the meteorite] was unfortunately already completely exposed around the sides, so that it could not be decided whether the limestone in the immediate proximity exhibited contact phenomena (Schneiderhöhn, 1931, 399).

While the author, the German geologist Von H. Schneiderhöhn, is silent as to who these 'experts' were, fortunately Spencer informs us that Schneiderhöhn's account

of the meteorite was based upon information supplied by "Mr A. Stahl", a geologist who worked on the ground during 1922-26, but who only saw the meteorite in 1925 (Spencer, 1931, p. 4). However, as both Schneiderhöhn's and Spencer's papers were only published in 1931, news of the 1925 visit by 'experts' does not appear to have spread beyond the narrow confines of the Grootfontein district.

Two years later the *Appendix to the Catalogue of Meteorites* (Hey and Prior, 1927, Appendix, p. 23), includes an entry on the meteorite. This was supplied by Dr A.W. Rogers, the Director of the South African Geological Survey. However as it was based on the contents of Hanssen's letter of 17 September 1921 to Rogers discussed in Part I above (Hanssen, 1921; Spargo, 2008, 89), it was brief and of limited scientific value.

Thus some six years after its discovery by Jacobus Hermanus Brits, news of the existence of the great meteorite had not yet diffused into the public domain in the world at large – or even in Southern Africa. This was, however, soon about to change.

³ "With this more than sufficient fund I made immediate plans to go to Southwest Africa to visit ... the Tsumeb copper mine. The latter was still operated by the German owners although the German colony had been taken over by the English Union Government. I was well received by the Mine officials and went underground to see the workings which at 500 to 800 feet depth were still in rich oxidised ore. It was a museum sort of place with caves of malachite, azurite, cerussite and smithsonite on every hand. ... I collected madly although I did not find any of the top quality crystals. ... I overdid in Tsumeb and shortly after, while in the Diamond field, fell ill of enteric fever. I was desperately sick but recovered sufficiently to stay with the party with the rest of the trip." (Charles Palache, *The [Harvard University] Department of Mineralogy and Petrography, 1894-1940*, unpublished typescript, p.16. I must thank Dr Carl Francis of the Harvard Mineralogical Museum for this reference.)

DIE VOLKSBLAD, SATERDAG, 23 FEBRUARIE 1929

Wat is Vallende Sterre?

Een van die Grootstes Lê in Duits Wes

Meteore op Aarde wat 50 en 36 Ton Weeg

(Deur dr. W. J. Luyten.)

Fig. 4 (above) Hoba enters the public domain: the heading in *Die Volksblad* of Saturday, 23 February 1929.

Fig. 5 (right) Willem Jacob Luyten (1899-1994)



On Saturday 23 February 1929 the Bloemfontein Afrikaans-language newspaper, *Die Volksblad*, carried a dramatic article headed **Wat is Vallende Sterre?**, and sub-headed **Een van die Grootste Lê in Duits West**, and **Meteore op aarde wat 50 en 36 Ton Weeg**⁴ (Fig. 4). As far as can be ascertained, this was the first appearance in the public domain of any information regarding the meteorite. Translated, its opening paragraph reads as follows:

On the farm "Hoba Wes" of Mr J.H. Oosthuizen in German West a great meteor has fallen. This stone consists largely of iron, weighs approximately thirty six tons, and is nine feet long, six feet wide and four feet deep. The meteor fell in chalky ground and the ground around it is scorched.

Although it includes a photograph of the meteor, showing clearly the trench that had been excavated around it, after the

two opening sentences quoted, the article, which is *c.* 800 words in length, does not contain a single further word on the Hoba meteorite, but instead describes the characteristics of meteors in general, and particularly the Arizona and Siberian impact events.

The article was written by Willem J. Luyten (Fig. 5), an astronomer at Harvard College's Boyden Observatory at Mazelspoort, north-east of Bloemfontein. The following year he recounted the background to this, the first public announcement of the existence of the meteorite:

Toward the middle of February [1929] the editor of *Die Volksblad*, the Afrikaans daily newspaper of Bloemfontein, showed me a photograph he had received from one of his readers, which photograph purported to be

⁴ 'What are Falling Stars?'; 'One of the Largest Lies in German West'; 'Meteors on Earth that Weigh 50 and 36 Tons'.

of an enormous meteor lying in the Grootfontein district, South West Africa. A hurried enquiry as to the reality of this meteor, made by writing to the directors of the various museums in the Union and to several newspaper editors, disclosed the fact that although the existence of this enormous meteor had been known for a considerable length of time, little more was known ... (Luyten⁵, 1930, 13).

A fortnight after Luyten's article in *Die Volksblad*, the *Cape Times* also printed a photograph of the meteor, surrounded by a trench and observed by two somewhat bemused-looking men. The editor was apparently not aware of the significance of the illustration as the caption to this, in all probability the first photograph of the meteorite that would have been distributed outside South Africa, merely reads:

A GIANT METEOR – This huge meteor, which measures about 10 feet square by 4 feet deep, has been found on the farm Hoba-West, district Grootfontein, S.W.A. Its estimated weight is 40 tons (*Cape Times*, 1929a).

However, worldwide publicity was now not long in coming for on Wednesday, 13 March 1929 the *New York Times* announced the discovery of the meteorite

under the bold headline: “**METEOR DESCRIBED AS WORLD'S LARGEST / Harvard Astronomer Estimates that African Specimen Weighs 50 to 70 Tons**” (Fig. 6). In this brief article, which includes no illustration, Luyten reported on his personal examination of the meteorite which, if not profound, is at least accurate, at the same time comparing it to the meteorite discovered by Admiral Peary in Greenland.⁶ (Because of its historical importance as the first description of the meteorite by a scientist in a source available to the public at large, we reproduce it in full in Appendix I.)⁷

As this news item appeared in the *New York Times* of 13 March, – i.e. the day following its dateline of ‘GROOTFOOTE, Southwest Africa, 12 March’ – it could only have been cabled to New York. Given the remoteness of Grootfontein, which is more than 2 000 km from Cape Town (from where the article would have been sent to New York by undersea cable) its appearance in print in New York the day after its despatch from a small isolated town in northern South-West Africa, attests to the extraordinary efficiency of the cable communications of the period.

⁵ Willem Jacob Luyten was born in Java, Indonesia, in 1899, to Dutch parents. Educated in Indonesia and in Holland, he was a most accomplished linguist, becoming proficient in Dutch, French, German, English, Spanish, Italian, Russian, Latin and Greek! The return of Halley's comet in 1910 stimulated his interest in astronomy and as a result he spent his life as a professional astronomer. In 1923, after spending two years at Lick Observatory in California, Luyten was offered a position at the Harvard College Observatory by the Director, Harlow Shapley. He spent seven years on its staff, the last two in Bloemfontein. He was an extremely assiduous observer.

⁶ For details of the meteor discovered by Peary, see Spargo, 2008, p.85, n.2

⁷ A week later, on 22 March, the prestigious American journal *Science* published an anonymous note on the meteorite which was clearly ‘lifted’ from Luyten's account in *The New York Times*. (*Science*, 1929)

Luyten's brief description of the meteorite in the *New York Times* of 13 March was followed five weeks later by a very much fuller one, some thousand words in length (Fig. 7). Now described as a 'Special Correspondent to the New York times', in his second article Luyten wrote at length about the 'Mysterious Visitor From the Skies', providing not only technical details of the meteorite, its location, etc., but also a vivid, if somewhat romanticised description!, of its fall:

A black mass of iron, cruising through space, invisible to all. Suddenly, as it enters the atmosphere of the earth, its great speed and the excessive friction it encounters set it ablaze in a fraction of a second. An enormous

fireball, white hot, darting across the sky with lightning rapidity, it approaches the ground with an angry hiss. A terrific roar as it strikes the ground and crashes through the layers of limestone. A shower of sparks, sand, rocks and metal, a cloud of dust – and soon all is quiet again.

With its nose buried deep in the soft rocks, it will soon be covered up entirely by the erosion of the surrounding limestone, and its tomb will be sealed against the curious eyes of posterity. Thus it will lie in its unassuming grave. It has been unwatched in its descent, except perhaps by some awe-stricken primitive man ... (New York Times, 1929b).

**METEOR DESCRIBED
AS WORLD'S LARGEST**

Harvard Astronomer Estimates
That African Specimen
Weighs 50 to 70 Tons.

IS PRACTICALLY ALL IRON

Scientist Seeks to Establish Its Connection
With Smaller Ones in
the Neighborhood.

By W. J. LUYTEN,
Of the Harvard Observatory.

Special Cable to THE NEW YORK TIMES.
GROOTFOOTE, Southwest Africa,
March 12.—The giant meteor which
fell recently at Otjilbaene, near the
Grootfontein railhead in the extreme
northeastern part of Southwest Africa,
is the world's largest meteor. I

**LARGEST METEORITE
IS FOUND IN AFRICA**

Mass Exceeding Fifty Tons,
Mostly Iron, Dug From Lime-
stone in Grootfontein Region.

THERE PERHAPS FOR AGES

Mysterious Visitor From the Skies
Has a Flat, Level Top Surface
of Nine by Ten Feet.

By W. J. LUYTEN
Of the Harvard College Observatory.
Special Correspondence of THE NEW YORK
TIMES.

BLOEMFONTEIN, South Africa,
March 14.—Again chance has led us
to the discovery of one of those mys-
terious messengers that come to the
earth, bearing evidence that space
is not empty but is populated with
a vast multitude of small fragments

Having estimated the mass of the meteorite as fifty tons ('Truly a rock of ages!'), its loneliness and humility ('... it lies, unassuming, in its silent tomb of limestone ...'), and stating his belief that its surpasses in weight the meteorite brought back by Admiral Peary from Greenland, 'and which now reposes in the Museum of Natural History in New York City', Luyten gives serious consideration to the possibility of moving the newly-discovered mass to some less remote location – presumably also to the American Museum

Fig. 6 (left) The news of Hoba's discovery spreads around the world: *New York Times*, 13 March 1929.

Fig. 7 (right) A longer description of the Meteorite: *New York Times*, 21 April 1929.

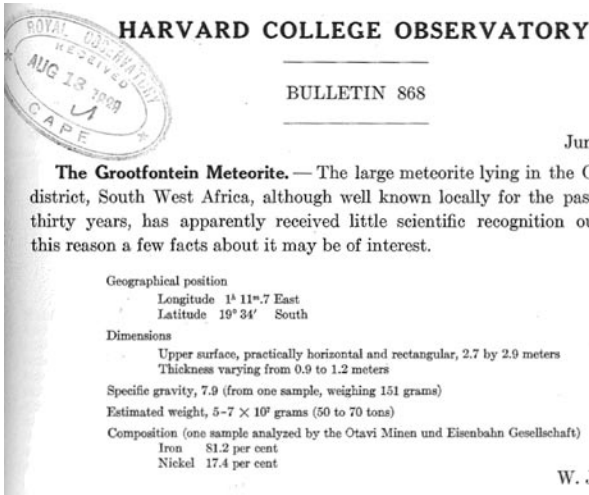


Fig. 8 (left) The first description of the Meteorite in the Scientific Literature. Source: Harvard College Observatory Bulletin 868.

Fig. 9 (below) As knowledge of the existence of the meteorite spread, it became an object of local interest. Source: *Natur und Museum*, 1931.

of Natural History, although this is not stated explicitly!

He then goes on to discuss some of the technical problems involved in such an undertaking, seriously overestimating the capacity of the two-foot gauge light railway nearby to handle such a massive object (see Appendix II). While Luyten was without doubt an exceptionally competent and assiduous observational astronomer it is clear that his understanding of the carrying-capacity of light railways – and especially those of only 2 ft gauge – was seriously lacking!



has] apparently received little scientific recognition outside.” The note, only some half a page in length, described the meteorite with respect to latitude and longitude, dimensions, specific gravity and estimated weight, as well as the quoting the results of the analysis carried out by the Otavi Minen und Eisenbahn Gesellschaft (Fe 81.2%; Ni 17.4%) (Fig. 8). While Luyten was almost certainly incorrect in his estimate of how long the meteorite had been “well known locally”, the note is important as marking the first hard information on the

Soon after this Luyten published a brief note on the meteorite in the *Bulletin* of the Harvard College Observatory, describing it as an object which was “well known locally for the past twenty or so years, but [which

meteorite to appear in the scientific literature (Luyten, 1929a).

A forum for the first public description of the meteorite now presented itself to Luyten. From 1884 onwards the British Association for the Advancement of Science (BAAS) had from time to time held its Annual Meeting in countries other than Britain, for example Australia, Canada or South Africa. Thus in August 1929 the Ninety-Seventh Annual Meeting of the Association was held in South Africa, with the scientific sessions divided between Johannesburg and Cape Town. At a session (somewhat curiously entitled 'Department of Chemical Physics') held in Johannesburg on 1 August Luyten delivered a lecture on 'The New Grootfontein Meteorite'.

Unfortunately the formal printed report of the BAAS meeting published later included only the title of the lecture (*British Association*, p. 315). However, the lecture was reported on at some length in the following morning's *Cape Times* under the heading "THE GROOTFONTEIN METEORITE / MASS OF METAL AS HARD AS STEEL" (*Cape Times*, 1929b).

Soon afterwards Luyten's BAAS lecture appeared in print in the *South African Journal of Science* (Luyten, 1929b). It was not, however, immune to criticism for a few years later it was described by Spencer as follows, "This paper gives a quite inadequate description of the meteorite, and moreover contains some inaccuracies." (Spencer, 1932, p. 4).

From the point of view of the Hoba meteorite a far more important scientific meeting that year was that of the International Geological Congress, which held its XV Session in South Africa in July and August. The congress was, as usual, followed by a number of excursion to places of geological interest and it was inevitable that one such would be to that geological treasure house, South West Africa. The participants of this excursion travelled by train from the railway junction at De Aar, south of Kimberley, to Windhoek, fortunately in a "a special saloon provided by the courtesy of the Divisional Superintendent of the South African Railways (SAR) at Windhoek." This long journey was followed by an almost equally long one on the narrow-gauge (2 ft. 6 inches) railway to Tsumeb. (The party left 'early in the morning' and only arrived at Tsumeb at 22h00 that evening – and there was almost certainly no dining car on the train!)

Next morning the party were taken underground at the Tsumeb mine while "after lunch the keen mineralogists spent some time searching the [waste ore] dumps, accompanied by native boys with boxes supplied by the mine." The following day the party split, the larger group visiting the Etosha Pan while a much smaller group visited the meteorite (Anon, 1929, pp. 279-282).

Their visit to the meteorite was later described by L.J. Spencer, of the British Museum:

Fig. 10 The International Geological Congress Excursion to the Meteorite, September 1929. *Left to right:* Prof L.C. de Villiers (Pretoria); Dr L.J. Spencer (British Museum, London); Mr W.R. Feldtmann (Grootfontein); Mr E. Schoenfelder (Grootfontein); Mr von Schmettau (Tsumeb). Source: Spencer, 1931.



Here the party (a small one, as one motor-car broke down on the way, and the majority of the members had elected to visit the game reserve round the Etosha Pan) was conducted by Mr W.R. Feldtmann, the General Manager of the South West Africa Company. Unfortunately the visit was rather a hurried one and the time was all too short for any detailed study. Nor was it possible to collect any specimens beyond the 'iron-shale' surrounding the mass. The huge block of metal is roughly rectangular in shape with few irregularities and no projections (Spencer, 1931, p. 5) (Fig. 10).

Finally, to round off 1929, the year of the meteorite's full 'coming-out-at-large' into both the public and scientific domains, a general article on "Meteors" in *Scientific American* by the Great American astronomer Henry Norris Russell contained no less than three photographs of 'The Grootfontein Meteorite', with one showing Luyten himself standing 'in the excavation' next to the great mass. Astonishingly, there is no mention of the meteorite in the article itself! (Russell, 1929). ☆

Acknowledgments

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METEOR DESCRIBED AS WORLD'S LARGEST

Harvard Astronomer Estimates That African Specimen Weighs 50 to 70 Tons.

IS PRACTICALLY ALL IRON

Scientist Seeks to Establish its Connection With Smaller Ones in the Neighborhood.

**By W. J. Luyten.
Of the Harvard Observatory.**

Special Cable to THE NEW YORK TIMES.

GROOTFOOTE, South West Africa, March 12. - The giant meteor which fell recently near Otjihaene,* near the Grootfontein railhead in the extreme northeastern part of Southwest Africa, is the world's largest meteor. I have just examined it and found it larger than the Greenland meteor discovered by Admiral Peary and now in the American Museum of Natural History in New York, but not so large as the possible meteor which formed the Arizona crater at Coolbutte.

We found the meteor embedded and buried in soft limestone on the high veldt, but a pit dug around it shows the depth varies from three to five feet. The limestone underneath was crushed by the terrific smash of the impact for several feet further down. On the sides of the limestone crumbling was caused by the excessive heat of the meteor, which was white hot when it plunged to earth.

Its size is 10 by 10 by 4 feet. It is of solid iron and its weight is estimated at fifty to seventy tons. The upper surface is flat and almost level, with occasional typical meteor indentations. It is rusty all over, but a cross section shows its metallic structure, although melting with a blowtorch is very difficult. A preliminary analysis indicates 10 per cent of nickel, but otherwise it is all iron.

It is suggested that there is a possible connection between this meteor and large numbers of others found in the neighborhood of Gibeon, south of Windhoek. I am now on my way to investigate."

* Otjihaenene is the named 'place' closest to the meteorite, being only some seven km away. In the 1920s it was one of the halts on the narrow-gauge railway between Otavi and Grootfontein and in those days its population may well have consisted only of a stationmaster and his family – if indeed that!

Appendix II

The New York Times, Sunday 21 April 1929, Section 3, p. 8

“In so far as we now know, it appears that the Grootfontein meteor is the largest in captivity. ... It would seem well worth while, therefore, to remove this giant to a more accessible place, where it could be admired by those interested. Its present location is such that few persons will consider the reward of seeing it sufficient to brave the hardship of travelling nearly 1,800 miles from Cape Town, mostly though a barren desert, on a train that runs only once a week – a journey lasting more than four days and ending up with an eighteen-hour trip on a two-foot-gauge railway at an average speed of only sixteen miles an hour.

The difficulties of removing the meteorite, on the other hand, are not insurmountable. The narrow-gauge railway which was built for the transportation of ore from copper and vanadium mines near Tsumeb, is run with engines of about forty-five tons and would thus be demonstrably safe for any such load as would be required in the case of the meteorite. There are no tunnels on the line and in the dry season no dangerous bridges. The location of the meteorite is about four miles from Otjoaenene, a siding on the railway line, and it would thus appear entirely possible to remove the world’s largest meteorite to more accessible and more appreciative surroundings.

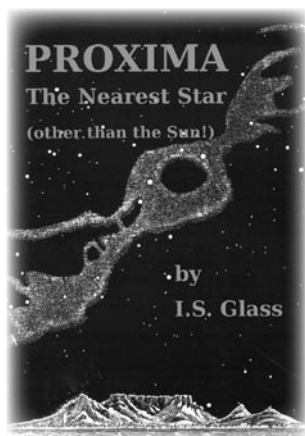
The difficulties, it must again be emphasised, are great, but at the present stage of engineering by no means impossible. In fact, one might almost say that American engineering would welcome the challenge to accomplish this feat and give a proper “place in the sun” to the new titleholder among giant meteorites.”

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book review



PROXIMA: The Nearest Star (other than the Sun!)

by I. S. Glass

Published by Mons Mensa, 2008

88 pp. with photographs and diagrams

Size: 148 mm x 210 mm (A5)

ISBN 978-0-9814126-1-3

Paperback. Price: R82.50

Available from the SAAO Shop (isb@sao.ac.za) or from glass.ian@gmail.com

One could say that this book is about the attempts of astronomers (two in particular) to measure accurately the difference between two angles. A difference which turns out to be three one-hundredths of a second of arc (0.03") - equivalent to measuring the width of a human hair from a kilometre away! The angles in question, called parallax, determine the distances to the nearest stars.

In his latest book Ian Glass writes in his usual accessible and engaging way about

astronomers both in South Africa and elsewhere, particularly in the period 1833 to 1928, who strove to measure the distances to the nearest stars and to establish which indeed was the nearest star to Earth. Here we read about Henderson at the Royal Observatory at the Cape, who first measured a distance to a star but was beaten to publication by Bessel in Prussia. Maclear at the Cape later confirmed Henderson's finding that Alpha Centauri was the nearest star known at the time.