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The earliest report of bone-bearing breccia from a Monte Christo Formation cave (South Africa)

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ABSTRACT

A series of historical documents by the 19th-century amateur naturalist and palaeontologist Alfred Brown report the earliest discovery of bone-bearing cave breccia in the former Transvaal (South Africa). The oldest of these reports dates from 1890 and predates the first mention of the existence of bone-bearing breccia at the famous Sterkfontein-Kromdraai caves by five years. The breccia fragment was kept by Brown in his collection, where it was noted to come from the Monte Christo gold mine near Ventersdorp (North-West Province). Brown's specimen is lost, but we could relocate the mine and confirm the presence of breccia deposits. Alfred Brown's notes are the earliest scientific report about the bone-bearing nature of Plio-Pleistocene South African caves and the first to acknowledge them as a potential source of hominin fossils, some 30 years before the discovery of the Taung Child, *Australopithecus africanus*. The finding strengthens the chronology of the discovery of the South African fossil hominin sites. It also significantly shortens the gap between the gold rush and the first discovery of bone-bearing breccia in the Witwatersrand.

1. Introduction

The discovery and exploration of the caves of the Fossil Hominid Sites of South Africa (FHSSA) during the Witwatersrand gold rush in the late 1800s–early 1900s dramatically changed our understanding of human evolutionary history and origins. The wealth of fossils contained in the one-to-four-million-years-old bone breccia that form the infilling of the FHSSA caves chronicles a crucial time interval in the evolutionary history of humankind. For example, the repeated discovery of *Australopithecus* fossils coupled with the debunking of the fraudulent Piltdown Man, firmly anchored the evolutionary roots of humankind in Africa by the 1950s (Thackeray, 2016a). Still today, these caves are the source of major palaeontological and archaeological breakthroughs, including the study of the most complete, fully articulated skeleton of an australopithecine, discovery of the richest monospecific hominin assemblage in Africa, and preservation of proteins enabling amino acid sequencing (Berger et al., 2015; Crompton et al., 2022; Madupe et al., 2023). Besides hominins, the cave breccia also preserves other incredibly abundant faunal remains, chiefly bovid bones and teeth (Vrba, 1974; Hanon et al., 2022).

So far, the earliest known report of bone-bearing breccia in the former Transvaal dates from the 1st of February 1895, when the geologist David Draper sent a sample from either Sterkfontein or Kromdraai to the British Museum in London (Draper, 1896; Malan, 1959; Oakley, 1960; Brain, 1981). The caves were mined almost immediately after their discovery. In contrast, palaeontological interest in the fossiliferous breccia would only be sparked much later on by the discovery of the first australopithecine, the Taung Child, in 1924 (Dart, 1925; Broom and Schepers, 1946).

The current work presents new evidence for the early history of exploration of bone-bearing breccia in the former Transvaal that was reported in the notes taken by the "Hermit-Naturalist" from Aliwal North (Eastern Cape, South Africa), Alfred 'Gogga' Brown, between 1867 and 1920 (Drennan, 1938). Though not formally employed as a palaeoscientist, Brown contributed to this field significantly through the discovery of 28 holotypes and a scientific publication (Drennan, 1938; MacRae, 1999). He also dutifully kept a record of all his scientific observations and correspondence with some of the greatest palaeontologists of his time, including Huxley, Lartet, Kannemeyer, Seeley, and Broom (Drennan, 1938). Today, Brown's notebooks are kept in the holotype vault of the Karoo Palaeontology Collections of the Iziko Museum of Natural History (Cape Town, South Africa).

The following excerpts, taken from his notebooks, push back the date of discovery of bone breccia in the former Transvaal by at least five years and refine the chronology of the early days of exploration of fossiliferous caves in the area.

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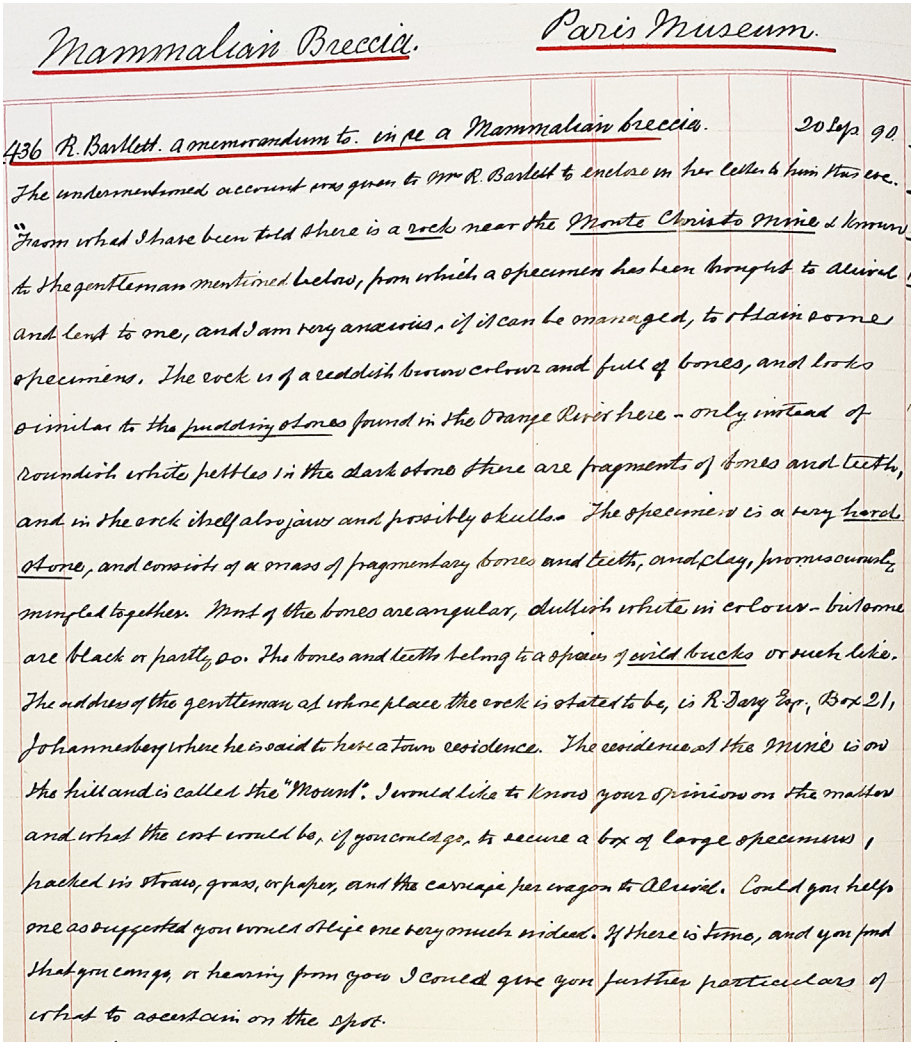
2. Excerpts

In an entry entitled the "mammalian breccia" (entry 436, Volume 21, Page 305), Brown provides a copy of a letter he addressed to Mr. Richard Bartlett. The entry is dated 20 September 1890, five years before the official discovery of Sterkfontein-Kromdraai. Below is the transcript of the letter in entry 436 (Fig. 1):

> "From what I have been told there is a rock near the Monte Christo Mine and known to the gentleman mentioned below, from which a specimen has been brought to Aliwal and lent to me, and I am very anxious, if it can be managed, to obtain some specimens. The rock is of reddish brown colour and full of bones, and looks similar to the pudding stones found in the Orange River here - only instead of roundish white pebbles in the dark stones there are fragments of bones and teeth, and in the rock itself also jaws and possibly skulls. The specimen is a very hard stone, and consists of a mass of fragmentary bones and teeth, and clay, promiscuously mingled together. Most of the bones are angular, dullish white in colour - but some are black or partly so. The bones and teeth belong to a specimen of wild bucks or such like. The address of the gentleman at where place the rock is stated to be, is R. Davy Esq; Box 21, Johannesburg where is said to have a town residence. The residence at the mine is on the hill and is called the 'Mount'. I would like to know your opinion on the matter and what the cost could be, if you could go, to secure a box of large specimens, patched in straws, grass, or paper, and the carriage per wagon to Aliwal. Could you help me as suggested you would oblige me very much indeed. If there is time, and you find that you can go, or hearing from you I could give you further particulars of what to ascertain on the spot."

The acknowledgement of receipt of the breccia (Volume 8, Page 467, repeated in entry 482, Volume 21, Pages 337–338, and again in entry 189, Volume 15, Page 155) is dated from 1891, one year after the above letter was sent. The breccia was sent to Alfred Brown as requested, though not by Bartlett, but by Dr. J.C. Daumas, an osteology enthusiast from France who accompanied Brown in many of his fossil "rambles" and provided him many specimens. The acknowledgement of receipt is accompanied by other trivia about mammalian-bone-bearing breccia discovered elsewhere in South Africa and Bechuanaland (now Botswana) that were communicated to him by Dr J.C. Daumas. One of the trivia reports a story dating from thirty years prior (late 1850s or early 1860s, see Discussion).

Below is the transcript of entry 482, Volume 21, Pages 337–338 (note that the phrasing differs slightly between here and the copies in Volume 8, Page 467, and in entry 189, Volume 15, Page 155 which is illustrated in Fig. 2):

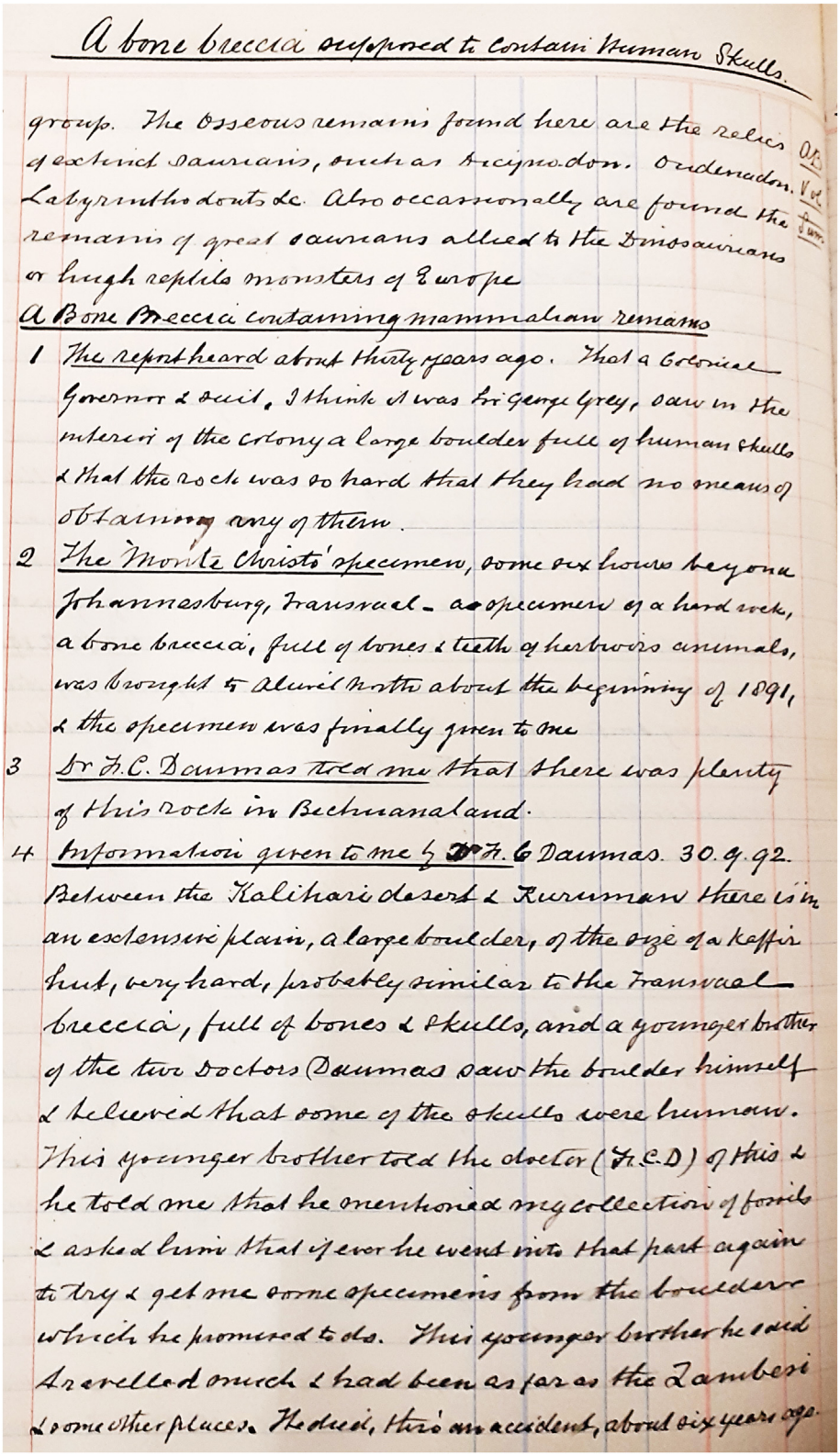

Mammalian Breccia. Paris Museum.

436 R. Bartlett. a memorandum to. re pe a Mammalian breccia. 20 Sep 90

The undermentioned account was given to Mr R. Bartlett to enclose in her letter to him that exc.

"From what I have been told there is a rock near the Monte Christo Mine & known to the gentleman mentioned below, from which a specimen has been brought to Aliwal and lent to me, and I am very anxious, if it can be managed, to obtain some specimens. The rock is of a reddish brown colour and full of bones, and looks similar to the pudding stones found in the Orange River here - only instead of roundish white pebbles in the dark stone there are fragments of bones and teeth, and in the rock itself also jaws and possibly skulls. The specimen is a very hard stone, and consists of a mass of fragmentary bones and teeth, and clay, promiscuously mingled together. Most of the bones are angular, dullish white in colour - but some are black or partly so. The bones and teeth belong to a specimen of wild bucks or such like. The address of the gentleman at where place the rock is stated to be, is R. Davy Esq., Box 21, Johannesburg where he is said to have a town residence. The residence at the mine is on the hill and is called the "Mount". I would like to know your opinion on the matter and what the cost would be, if you could go, to secure a box of large specimens, packed in straw, grass, or paper, and the carriage per wagon to Aliwal. Could you help me as suggested you would oblige me very much indeed. If there is time, and you find that you can go, or hearing from you I could give you further particulars of what to ascertain on the spot.

Fig. 1. Excerpt of Alfred Brown's entry 436, Volume 21, Page 305, mentioning the bone-bearing breccia for the first time. Image by J.B.



A bone breccia supposed to contain Human Skulls.

group. The osseous remains found here are the relics of extinct saurians, such as Trigonodon. Oudenodon. Labyrinthodonts &c. Also occasionally are found the remains of great saurians allied to the Dinosaurians or huge reptils monsters of Europe

A Bone Breccia containing mammalian remains

1 The report heard about thirty years ago. That a Colonial Governor & suit. I think it was Sir George Grey, saw in the interior of the colony a large boulder full of human skulls & that the rock was so hard that they had no means of obtaining any of them.

2 The Monte Christo specimen, some six hours beyond Johannesburg, Transvaal – a specimen of a hard rock, a bone breccia, full of bones & teeth of herbivors animals, was brought to Aliwal North about the beginning of 1891, & the specimen was finally given to me

3 Dr J.C. Daumas told me that there was plenty of this rock in Bechuanaland.

4 Information given to me by Dr. C. Daumas. 30.9.92. Between the Kalihari desert & Kuruman there is an extensive plain, a large boulder, of the size of a kaffir hut, very hard, probably similar to the Transvaal breccia, full of bones & skulls, and a younger brother of the two doctors Daumas saw the boulder himself & believed that some of the skulls were human. This younger brother told the doctor (Dr C.D) of this & he told me that he mentioned my collection of fossils & asked him that if ever he went into that part again to try & get me some specimens from the boulders which he promised to do. This younger brother he said travelled much & had been as far as the Zambesi & some other places. He died, this an accident, about six years ago.

Fig. 2. Excerpt of Alfred Brown's entry 189, Volume 15, Page 155, which provides further information on Southern African bone-bearing breccia. Image by J.B.

"This is certain information I have received about the stone rock of which I have a specimen

1. The report heard about thirty years ago that a Colonial Governor and suit, and I think it was Sir George Grey, saw in the interior of the Colony a large boulder full of human skulls, and that the rock was so hard that they had no means of obtaining any of them [the skulls].
2. The Monte Christo Mine, six hours beyond Johannesburg S.A.R. Specimen of a hard rock, a bone breccia full of bones and teeth of mammals was brought from near the M.C. mine to Aliwal

North about the beginning of 1891 and the specimen was since given to me. The specimen I have in my collection, it is an interesting specimen and there is no doubt about the mammalian character of the bones.

3. Dr J.C. Daumas informed me during a conversation about the specimen that there was plenty of this rock in Bechuanaland.
4. Information given to me by Dr J.C. Daumas on 30 September 1892. Between the Kalihari Desert and Kuruman there is an extensive plain, a large boulder, of the size of a ka***r [African] hut, very hard probably similar to the Transvaal breccia, full of bones and skulls, and a younger brother of the two Doctor Daumas saw the boulder himself, and believed that some of the skulls were human. This younger brother told the Doctor (J.C.D.) of this, and he told me that he mentioned my collection of fossils and asked him that if he went into that part again to try and get me some specimens from the boulder. This younger brother he said travelled much and had been as far as the Zambesi and some other place. He died through an accident about six years ago."

Noticeably, this entry is headed "A bone breccia supposed to contain human skull", whereas in volume 21, it is entitled simply '*A mammalian breccia*'.

The bone breccia specimen was finally examined on the 29 November 1915, 24 years after Brown received it, by Prof. Sydney Haughton, then the head of the South African Museum in Cape Town. Brown summarises Haughton's opinion of the bone breccia in an entry in Volume 18, Page 131 (Fig. 3):

> "Remarks. Told me that he [Sydney Haughton] was described the Boskop Skull referred to in the Cape Times (Daily Tuesday, November 23. 1915). He says the portions of the skull was found in a Breccia which is formed from below and that the skull was partly embedded in it. Showed him the specimen of breccia in my possession containing the bucks which I received many years ago from Dr J.C. Daumas which he says is from an older formation than the Boskop breccia."

It is safe to assume that the bone breccia fragment remained in his possession until his death, stored in Tray 9 under specimen number 15 as reported in the catalogue of his collection he provides in Volume 14, Page 48. However, the breccia did not join his collection of 'chief specimens', listed in Volume 9, Page 462, despite that this list includes two stalactites from the Sterkfontein caves that he had in his possession since 1897 (specimens 518 and 534 in Volume 9, Page 462). He describes the two stalactites in Volume 9 (Pages 245 and 247). The first stalactite is "an extra large specimen from Sterkfontein Cave, Transvaal, obtained soon after its discovery from A. Alcock", and the other is "Recovered by W. Wright junior on August 6, 1897 [date abbreviated]. A fine white sugar like piece of stalactite from a newly discovered and extensive cave, called Sterkfontein Caves, eight miles N.E. of Krugersdorp, Transvaal, Lime kilns [Afrikaans word for furnace] are by the spot". Note that the same info is repeated in volumes 10 and 21.

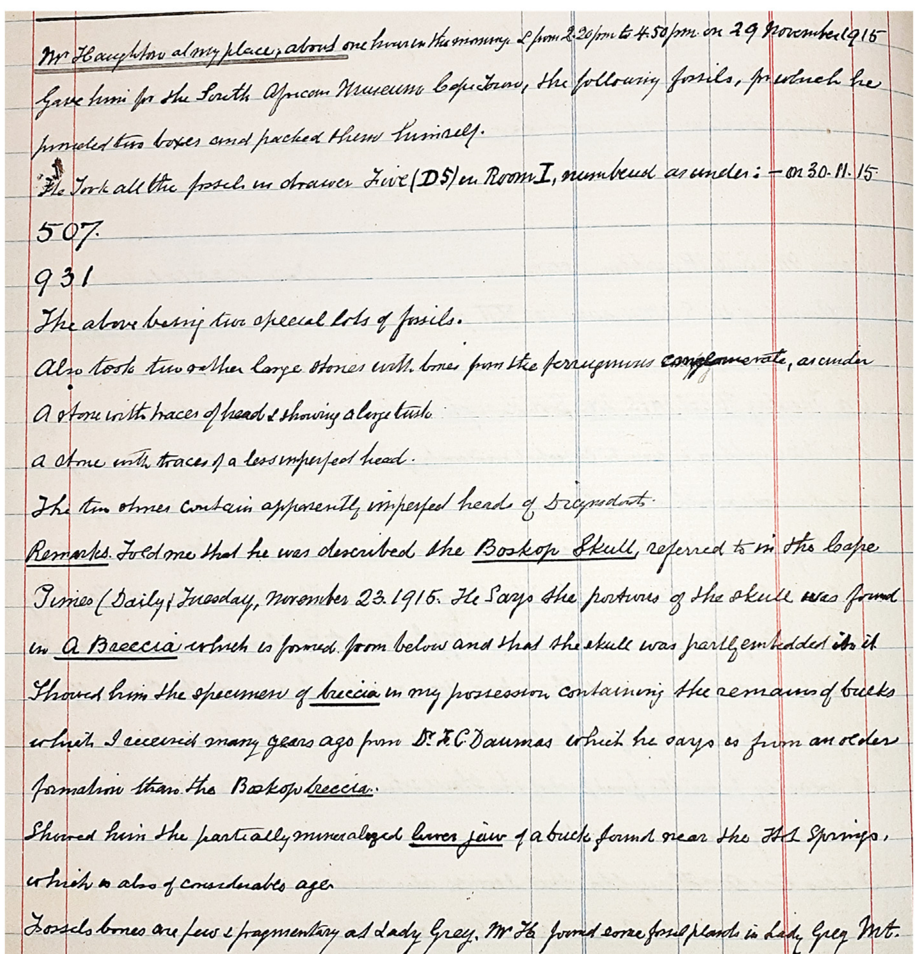

Mr Haughton at my place, about one hour in the morning & from 2.20 pm to 4.50 pm. on 29 November 1915
Gave him for the South African Museum Capetown, the following fossils, for which he
provided two boxes and packed them himself.
He took all the fossils in drawer Five (D5) in Room I, numbered as under: — on 30.11.15
507
931
The above being two special lots of fossils.
Also took two other large stones with bones from the ferruginous conglomerate, as under
A stone with traces of head & showing a large tusk
A stone with traces of a less imperfect head.
The two stones contain apparently imperfect heads of Dicynodont.
Remarks. Told me that he was described the Boskop Skull, referred to in the Cape
Times (Daily) Tuesday, November 23. 1915. He says the portions of the skull was found
in a Breccia which is formed from below and that the skull was partly embedded in it
Showed him the specimen of breccia in my possession containing the remains of bucks
which I received many years ago from Dr J.C. Daumas which he says is from an older
formation than the Boskop breccia.
Showed him the partially mineralized lower jaw of a buck found near the Hot Springs,
which is also of considerable age.
Fossils bones are few & fragmentary at Lady Grey. Mr H. found some fossil plants in Lady Grey Mt.

Fig. 3. Excerpt of Alfred Brown's entry in Volume 18, Page 131, summarising Prof. Sydney Haughton's opinion about the bone-bearing breccia in Brown's possession. Image by J.B.

Despite the fact that Brown's collection was transferred to the South African Museum (now Iziko Museum of Natural History, Cape Town) in 1921, and that many of his fossils are still duly curated there, the breccia specimen could not be relocated. As the scientific relevance of Plio-Pleistocene bone-bearing cave deposits for hominin evolution would be recognised only a few years later (Dart, 1925), and because Brown himself did not consider it one of his "chief specimens", perhaps the breccia specimen was not deemed important enough to be moved to the museum.

3. Discussion

3.1. The earliest report of Monte Christo Formation cave breccia

Brown's letter to Bartlett mentioning the bone breccia from Transvaal is from 1890. This is 7 years prior to the discovery of the Sterkfontein-Kromdraai caves, making it the earliest historical mention of bone breccia from the former Transvaal. The description of the breccia fragment is consistent with provenance from a cave similar to those of the FHSSA: the rock is described as "very hard", packed with "angular" bones and teeth of "bucks" (bovids), and cemented in a "reddish brown" matrix. As in the FHSSA caves, the bone is white and, in some cases, stained in black, probably because of manganese (Thackeray, 2016b). This perfectly matches the calcite-cemented detrital cave breccia from a talus cone deposit.

The specimen is said to have been found at the Monte Christo Mine, some "six hours beyond Johannesburg". A possibility that warrants scrutiny is that Brown may be referring to farm Monte Christo 199 KS, in the Lepelle Nkumpi Municipality (Limpopo Province, South Africa). This is the type locality of the Monte Christo Formation, in the Malmani Subgroup (commonly referred to as the Malmani dolomites) that encompasses the former Swartkrans and Crocodile River formations, and includes the thick dolomite deposits in which most of the caves of the FHSSA are located (SACS, 1980). However, whilst Alfred Brown says the Monte Christo mine is found "six hours beyond Johannesburg", farm Monte Christo 199 KS is some 300 km from Johannesburg. In his time, it would have taken several days to reach this place on foot or by horse carriage. Farm Monte Christo 199 KS is thus unlikely to be the place Alfred Brown was referring to as the Monte Christo mine. In addition, Brown mentions that the administrator of the mine lives in Johannesburg, which makes a location of the mine so far outside Johannesburg even more unlikely.

Brown is most likely referring to the Monte Christo gold mine near Ventersdorp mentioned in the contemporary literature (Dupont, 1890; Edwards, 1890; Goldmann, 1892; Bordeaux, 1898; Praagh, 1906). According to Dupont (1890) and Edwards (1890), this mine was managed by Robert Davy, which matches the "R. Davy" named in Brown's description. There is thus little doubt that the Monte Christo gold mine near Ventersdorp is the one where Brown's "mammalian breccia" was discovered. The mine was seemingly short-lived, as it opened on the 9th of April 1889 and ceased activity just two years later, on the 19th of May 1891 (Dupont, 1890; Edwards, 1890). The breccia was thus likely found in 1889 or early in 1890.

The Monte Christo gold mine no longer exists but used to be located on farm Wolvefontein (now Wolvenfontein 74, Fig. 4), where the Mooi River cuts the gold-bearing reef (Dupont, 1890; Edwards, 1890). In the contemporary literature, it is described as being located 60 miles (97 km) West of Johannesburg and 25 miles (40 km) North of Potchefstroom, and as neighbouring farms Welgevonden and Syferfontein, which matches today's plot Wolvenfontein 74 (Fig. 4; Dupont, 1890; Edwards, 1890). The mine itself is mapped on the Rysmierbult topocadastral map (2627AC, second edition), where it is marked as 'ou delwerye' (Afrikaans for old mines). We successfully relocated the mine (GPS coordinates: S26°17.259′/E27°04.931′; Fig. 4B, Fig. 5) and discovered numerous fragments of *ex-situ* breccia in its vicinity (Fig. 6). We could not ascertain the presence of *in situ* outcrops in the old mine as the current landowner did not give permission for access. Still, the Monte Christo mine may be an eroding cave infilling similar to those in the FHSSA since Wolvenfontein 74 is almost entirely located atop the Malmani dolomites (Fig. 4). The Monte Christo site, however, does not display the characteristic cluster of medium-sized trees (*e.g.*, stinkwood and wild olive) usually found around karst systems, but much taller trees instead (Fig. 5). It is likely that the indigenous vegetation was replaced during the exploitation of the mine, but one may consider the possibility that the breccia was exploited elsewhere on Wolvenfontein and then transported to the Monte Christo mine. Cave breccia deposits are, indeed, not scarce in the area (Fig. 6) and given the rocks underlying Wolvenfontein 74 (Fig. 4), Alfred Brown's piece of breccia could have been discovered by gold prospectors anywhere on the farmland, regardless of the exact geological nature of the Monte Christo deposit. As such, even though it can be reasonably hypothesised that Brown's breccia was blasted out of the Monte Christo mine, it is also reasonable to leave open the possibility that it may have come from any other cave deposit on the Wolvenfontein 74 farm.

As stated above, we could not prospect the site nor study the fossils from the original breccia fragment, so estimating an age for the deposits is impossible. Brown's description of his fragment matches that of many Plio-Pleistocene breccia deposits in the FHSSA.

Alfred Brown does not state how he became aware of this fragment of bone-bearing breccia. Still, he is arguably the first person known to have identified and expressed interest in the fossils of the former Transvaal and addressed their scientific relevance, some five years prior to Draper (Malan, 1959). This would make Wolvenfontein 74 the first site to reportedly deliver Plio-Pleistocene bone-bearing cave breccia.

3.2. The other three reports of bone breccia in Southern Africa

Alfred Brown associated his fragment of bone-bearing breccia with three other trivia (Fig. 2). The first story is a second-hand report about Governor George Grey who would have found boulders 'full of human skulls' in the 'interior of the colony'. The story is said to be about thirty years old at the time Brown wrote about it, placing it in the late 1850s or early 1860s. Governor George Grey toured the Cape Colony and made a stop at Aliwal North in the summer of 1860 (Theal, 1908), which concurs with Brown's recollection of the event. That Brown reports this story alongside the acknowledgement of receipt of the breccia fragment from Transvaal suggests that he believed George Grey had made a similar discovery in the area. The erosion into 'boulders' mentioned by Brown evokes indurated cave infillings forming mounds after the dolomitic walls of the cave have been eroded (Brain, 1981). If placed in the former Transvaal, this report could potentially push the discovery of hominin remains to the mid-1800s. However, by the time they reached Aliwal North, Grey 'and his suit' had not visited the Transvaal Republic yet. They had been in the vicinity of Stellenbosch, Paarl, Drakenstein, Port-Natal, Port-Elizabeth, Grahamstown, Queenstown, Fort Beaufort, Alice and King-Williamstown only (Theal, 1908). Moreover, Brown places the discovery in the 'interior of the colony'. In contrast, the Transvaal was not yet annexed to the Cape Colony in 1860, so there is little chance that this bone breccia was found in the Transvaal Republic. Given the places visited by Grey at that point in his trip, the boulders he saw could be from almost anywhere in the former Cape Colony. Additionally, Grey's obsession with collecting human skulls is well-documented (O'Leary, 2020). As such, identifying the fossils as belonging to human crania may very well be a leap of faith.

The other two trivia (numbered 3 and 4) were told to Brown by his fellow fossil-enthusiast J.C. Daumas in 1892, and report boulders of bone breccia in Bechuanaland and near Kuruman. The former story provides a quite vague location in or near modern Botswana. It could refer to the Makapansgat Historic Cave, which around that time was becoming a popular spot for collecting human skulls dating from the 1854 siege amongst bone collectors and naturalists (Distant, 1892). The other may reference the Wonderwerk Cave, located immediately south of

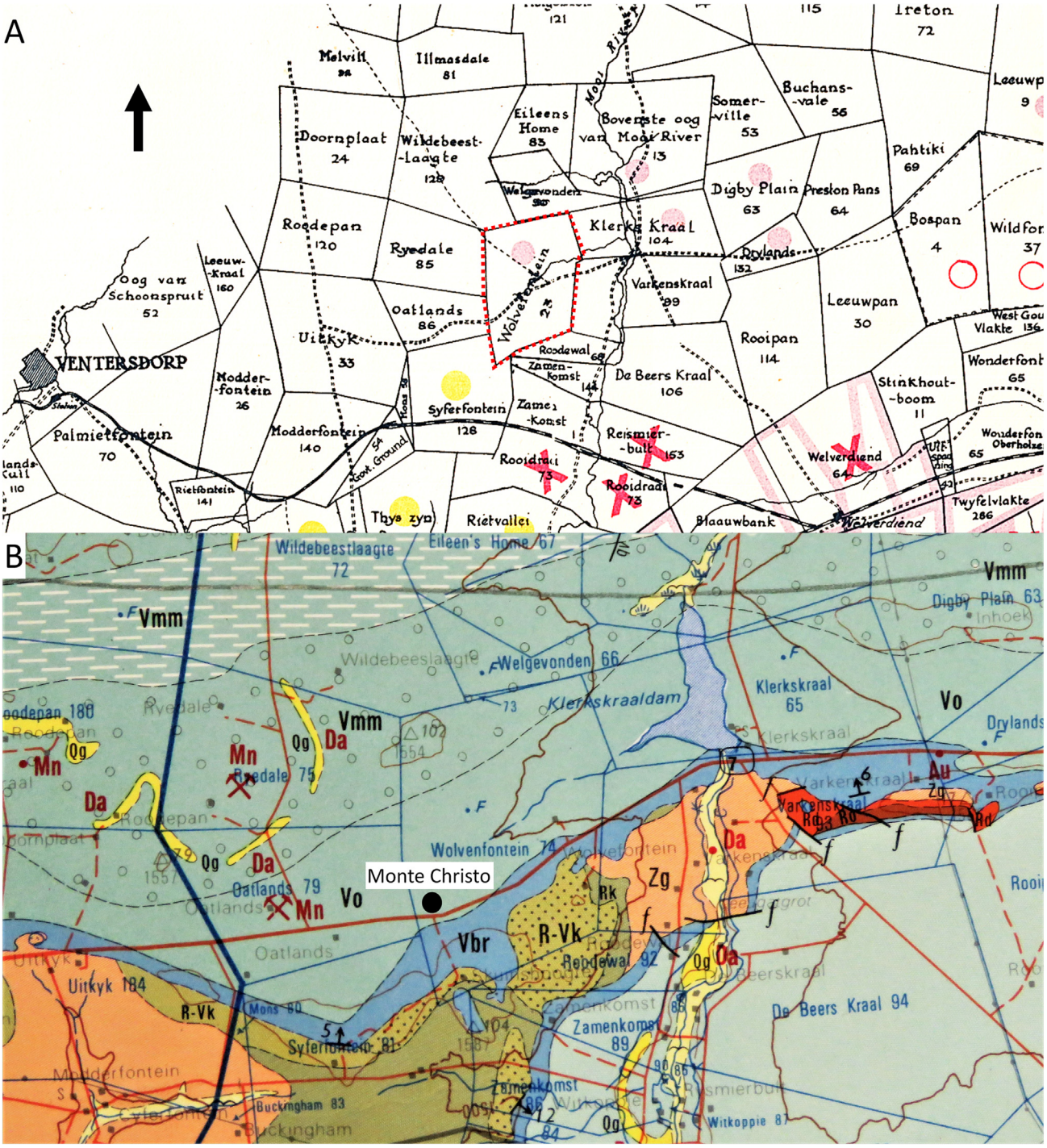


Fig. 4. Maps showing the location of Wolvefontein (now Wolvenfontein 74) and the Monte Christo Gold mine. A, excerpt of Holmden's new plan of the greater Witwatersrand goldfields (*circa.* 1900s). The original is in the possession of the University of Cape Town Libraries, reproduced here with their authorisation. B, excerpt of the 1:250,000 geological map of the West Rand 2626 (South African Council for Geoscience, 1986), showing the position of the Monte Christo gold mine. Vmm and Vo mark the Malmani dolomites. The black arrow points to the north.

Kuruman. Wonderwerk Cave was discovered earlier in the 1840s, but bone would only be found there a hundred years later (Howitz and Chazan, 2015). This would make Daumas' report valuable if indeed he was referring to this site. However, many other archaeological sites exist in the area (*e.g.*, Wilkins et al., 2021), so this account is too vague to be conclusive. Moreover, neither Makapansgat Historic Cave nor Wonderwerk Cave has bones preserved in breccia.

4. Concluding remarks

Brown's letter to Bartlett in 1890 constitutes the oldest report of fossil-bearing cave breccia in the former Transvaal, five years before Draper's letter to the British Museum. The bone breccia from the Monte Christo mine was likely discovered in 1889 or early in 1890. With the Witwatersrand gold rush beginning between 1884 and 1886,

Fig. 5. Picture of the Monte Christo old gold mining site (taken from the N14 road). The black arrow points to the north.

and famous fossil caves such as Kromdraai being mined as early as 1881 (Antrobus, 1986), it is rather strange that no mineworker or geologist recognised the presence of fossil-bearing breccia in the 10–15 years preceding Draper's discovery. The Monte Christo breccia fills in this historical gap, and reconciles the chronology of mining and fossil finding in the Witwatersrand goldfields. In addition, Brown's collection included stalactites recovered in 1897 from what he described as the "newly discovered" Sterkfontein cave "soon after its discovery". This supports that this cave was discovered the year prior, as already acknowledged in the contemporary literature (Draper, 1896). Overall, the new historical evidence provided in Brown's notes strengthens the chronology of the exploration of the fossil-bearing caves of the former Transvaal.

Unfortunately, Alfred Brown's notes were never published, even though some excerpts have been used in the scientific literature to relocate important historical fossil finds (Kammerer, 2018; Masters, 2019; Wolvaardt et al., 2023). This partly explains why his accounts about Plio-Pleistocene bones in the caves of the Monte Christo Formation went unnoticed. Additionally, in 1915, a major palaeontological authority of his time, Sydney Haughton, failed to recognise the scientific importance of this breccia (Fig. 3). As stated in the introduction, palaeontologists' curiosity towards the bone-bearing breccia of the FHSSA only began with the publication of the first *Australopithecus* skull (Dart, 1925). The discovery of the Piltdown Man in 1912 had already strongly biased palaeoanthropologists towards thinking that humankind had an Eurasian origin, which means that in 1915, Africa was considered irrelevant to the great human evolutionary journey (Eitzman, 1958; Kuljian, 2016; Thackeray, 2016a). So, even though Haughton rightly identified the breccia fragment as being older than the Boskop skull, there was no reason at the time to consider the Monte Christo deposit as a potential source of important findings. Similarly, Robert Broom, who corresponded abundantly with Brown and visited him regularly seemingly never expressed any interest towards the breccia fragment. Broom was evidently more interested by Karoo-aged fossils at the time, and would remain so until 1934, when he moved to Pretoria and started working for the Transvaal Museum (Wyllie, 2003). Also, Brown actively kept Broom away from some parts of his collection, including his anthropological specimens (Drennan, 1938).

Almost 35 years before the description of the Taung Child was published, Brown foresaw the potential of Southern African bone-bearing breccia for the field of palaeoanthropology. This is evident as he described his breccia fragment alongside other reports in an entry entitled 'A bone breccia supposed to contain human skulls' (Fig. 2). The heading refers to George Grey's story, who reportedly found a boulder 'full of human skulls', but Brown's choice to associate his specimen of bone-bearing breccia with this story indicates that he expected such deposit to deliver hominin fossils. That he and Haughton later compared the specimen to the Boskop deposit also supports this. This is quite a remarkably accurate, though probably lucky, prediction of the upcoming scientific success of the FHSSA.

Declaration of generative AI in scientific writing

No AI was used to generate this manuscript and data.

Declaration of competing interest

The authors declare no conflict of interest.

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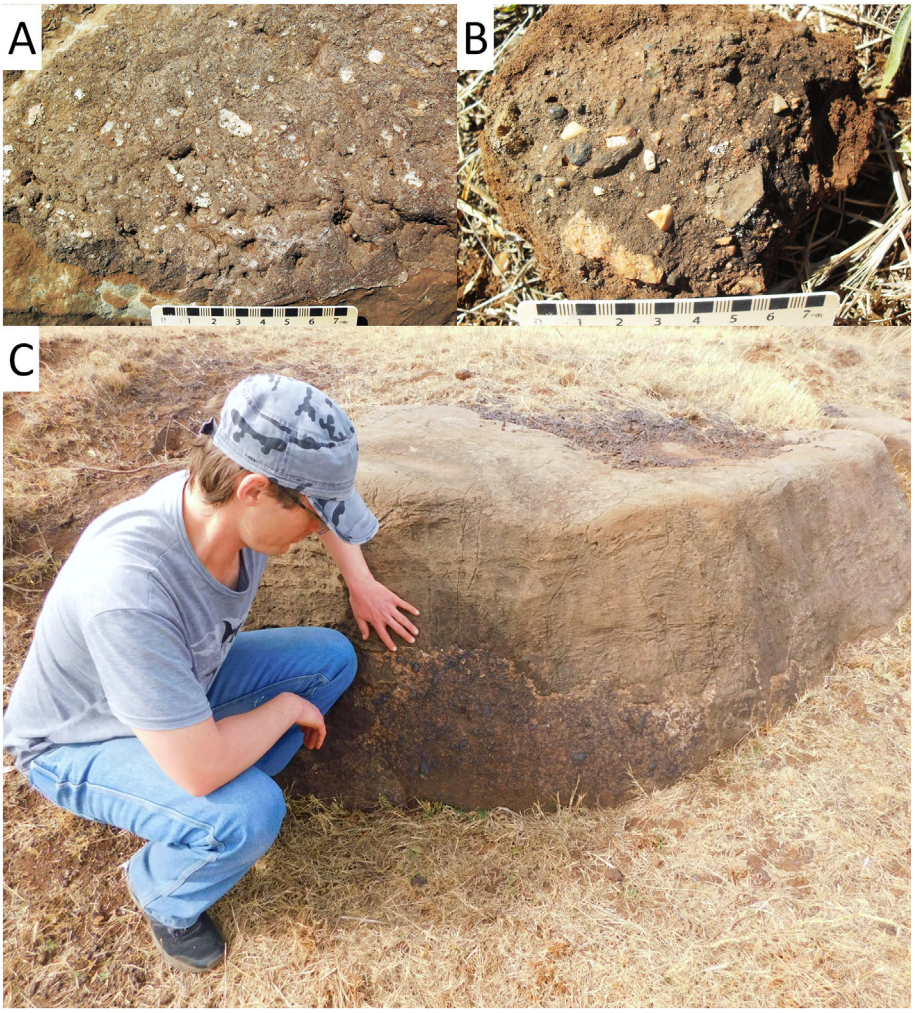

Fig. 6. Fragments of breccia found around the Monte Christo old mining site. A and B, pieces of breccia found *ex-situ* on the N14 roadside a few metres from the old mine. C, J.B. next to *in situ* breccia found on Oatlands 79 (locality marked Mn on Fig. 4B).
Images A and B by J.B., and C by Alienor Duhamel, used with her authorisation.

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