

THE REAL FATE OF THE WATERLOO FALLEN

■ *The exploitation of bones in 19th century Belgium*

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What happened to the bodies of those killed at the Battle of Waterloo? Generations of historians have tried to find an answer to this and it is the one most commonly asked questions of those who visit the plain of Waterloo, the battlefield and the local museums today.¹ Between 10,000 and 20,000 men and, often forgotten, many thousands of horses were killed on that fateful day of 18 June 1815. Early visitors to the battlefield have recounted and documented, either in writing or in works of art, what happened on the battlefield once the guns had fallen silent. The dead, corpses of men and beast alike, were stripped and hastily buried in mass graves.² But despite the abundant documentation it has since then been impossible to locate these burials and archaeologists have thus far excavated only two human skeletons, the first in 2012 and the second in 2022, despite ever more sophisticated archaeological techniques.³

I. Introduction

Historiography has been drawn upon in the effort to understand this mystery. The most frequently cited theory is that the skeletons were exhumed in the 1820s and exported to England, where they were transformed into phosphate-rich bone meal for spreading on crops. In Britain such claims were first published in 1822.⁴ While the agricultural use of bones, even human bones, for fertilisation is not a fantasy but a well-established custom, there are no records to verify the practice at Waterloo. Using both history and archaeology, the three authors of this study aim to formulate an alternative theory and to support it with numerous unpublished sources, multiple testimonies and recent archaeological discoveries. In this article, it will be emphasised that the bodies of Waterloo were mostly unearthed not in the 1820s but after 1833, when the value of the bones rose drastically due to the demand created by the sugar beet industry, which had just been established on the Waterloo plain. It will be argued that the peasants, who benefited from the silence and a certain tolerance of the local and national authorities, sold the bones of the dead with the complicity of Belgian and foreign investors.

To do so, the authors of this article did a thorough research to identify all available mentions of bone excavations from 1815 to 1914 in the international press, including titles from Britain, Belgium, Germany, France and the Netherlands. Recently

acquired registers from Braine-l'Alleud and Planenoit, where the battle was actually fought, were systematically examined at the State Archives of Belgium.⁵ After all, exhumations were managed at a local level of power. The authors also investigated judicial and provincial archives, also kept at the State Archives of Belgium.⁶ Memoirs of international tourists in the first half of the 19th century proved useful. Previous evidence gathered in secondary sources was also examined and compared to our findings. It also seemed natural to rely on archaeological finds, one of the authors having dug the battlefield for the last seven years.⁷

The authors of this research will first discuss the post-1815 exploitation of the human and animal remains of the Napoleonic conflicts. They will then present the historical evidence concerning Waterloo before discussing the results of the archaeological excavations carried out in recent years on the 1815 site.

II. The “Bone Rush” of 1819

In the middle of the 17th century, the so-called agricultural revolution unfolded, particularly in England, but also in the regions of the East Elbe, in which crop yields rose sharply. This was due to more intensive cultivation methods, which had become possible not least through enclosure. Three-field farming with its traditional fallows was replaced. New crops such as beets and potatoes

1. On tourism, see: A. SEATON, “War and Thanatourism: Waterloo 1815-1914” in *Annals of Tourism Research*, n° 26, 1, 1999, 130-158 and STUART SEMMEL, “Reading the Tangible Past: British Tourism, Collecting and Memory after Waterloo” in *Representations*, 69, 2000, 9-37.

2. PAUL O’KEEFE, *Waterloo: The Aftermath*, London, 2015 and TONY POLLARD, “These spots of excavation tell: using early visitor accounts to map the missing graves of Waterloo”, in *Journal of Conflict Archaeology*, 16/2, 2021, 75-113.

3. DOMINIQUE BOSQUET, GENEVIÈVE YERNAUX, ALAIN FOSSION & YVES VANBRABANT, *Le soldat de Waterloo, enquête archéologique au coeur du conflit*, Namur, 2015 and *Le Point*, 12 June 2012 and 14 July 2022 [Available at www.lepoint.fr, consulted on 8 August 2022].

4. *The London Observer*, November 1822.

5. The *archives communales* are held at the Archives de l’État de Louvain-la-Neuve and were acquired in 2014 and 2016. The archives of the commune of Waterloo are still in local hands.

6. Unfortunately, most of the archives of the *Commissaire d’arrondissement* are missing, as are the archives of the Gendarmerie of Waterloo.

7. STUART EVE & TONY POLLARD, “From the Killing Ground: Digital Approaches to Conflict Archaeology. A Case Study from Waterloo” in *Digital War*, 1, 2020, 144-158. [Available online at <https://link.springer.com/article/10.1057/s42984-020-00013-y>, consulted on 12 August 2022].

were able to access nutrients more easily with their deeper growing roots. The growth of the population, which was encouraged by the agricultural innovations, created the conditions for the beginning of the industrial revolution. By the beginning of the 19th century, however, it became apparent that these new and innovative methods had depleted the soil, leading to nutrient shortage that was further exacerbated by ongoing urbanisation. Food consumption in the cities increased, but neither the kitchen waste nor the nutrient-rich faecal matter returned to the fields.⁸ As things stood, agriculture resorted to a seemingly effective, yet unsustainable solution, bone fertiliser. It is difficult to pin down when exactly people started using bone as fertiliser in agriculture, but there is evidence that the knowledge that bone, ground down and applied as manure, increased the value of the soil, was well established centuries ago. In the 17th century, at the beginning of Britain's Agricultural Revolution, the value of bones as fertiliser was mentioned in the writings of Blith, Hartlib, Worlidge and other leading English agriculturalists of the time.⁹

In 1769 the Swede Johann Gottlieb Gahn and the German Carl Wilhelm Scheele discovered that phosphate was the principal constituent of bones. Less than three decades later, the agricultural significance of that discovery was explored and described by Nicolas de Saussure, Erasmus Darwin and Humphrey Davy, who concluded that the main fertilising value of bone was its calcium phosphate and not – as it was previously believed – its organic matter.¹⁰ The first dedicated bone mill operated in England from about 1780, in Scotland not until 1829, and their advent resulted in a major stimulus to the use of bones on the fields. It would take another forty years until bone meal was more widely used by continental farmers, and

even then it was never enough to rival the turnover of bone in the British Isles.¹¹

The impact which this sudden introduction of a hitherto unknown and disregarded import/export commodity, and the rapidly rising demand for it, had on the coastal communities of the German states, is hard to overestimate. "From England", states one of the earliest German treatises on the attributes of bone meal as fertiliser in 1826, "the invention spread to France, long before anyone in Germany even knew, for what purpose several English ships carried entire cargoes of bones from northern Germany (...)".¹² In the following years, in territories with access to the coast, the poor, the homeless, the rag and bone collectors, day labourers and beggars swarmed out into the countryside to find and dig-up bones. At the same time bone collection and the storage of bones was becoming more and more regulated, as states and provinces all over Germany, and in the coastal regions in particular sought to bring order into chaos. Today these rules and regulations allow us a glimpse into the huge business which bone trading had become. In 1824 the city of Lübeck decreed that "the accumulation and storage of uncleaned bones in cellars, rooms and other locked premises in the city may not be tolerated as being detrimental to health, this is hereby forbidden to all and sundry, upon notification of a subsequent punishment".¹³

In the decades which followed the British need for bone fertiliser did not diminish. In the first half of the 19th century the Irish physician John Murray and the English agricultural scientist John Bennet Lawes, discovered that natural bone meal was not as effective for crop fertilisation as bone dissolved in sulphuric acid. In 1842 both patented the process of making what Lawes called "super-

8. RACHEL BAHN, *Crisis and Conflict in Agriculture*, Wallingford, 2018, 31.

9. Agricultural Research Service D.C. Soil and Water Conservation Research Division, in *Superphosphate: Its History, Chemistry, and Manufacture*, n° 164, 1964, Washington, 8.

10. W.A. LUTZ & C.J. PRATT, "Miscellaneous Phosphate Fertilizers", in *The Chemistry and Technology of Fertilizers*, New York, 1964, 321-344.

11. HERMANN BIELEKE, *Die Geschichte der künstlichen Düngung und der Kunstdüngerversorgung*, Gotha, 1934, 6.

12. *Münchener Politische Zeitung*, n° 161, 10 July 1820, 1.

13. *Lübeckische Anzeigen*, N°. 43, 29 May 1824, 1.

phosphate".¹⁴ The invention, with which it was possible to double crop yields and which was a far superior turnip fertiliser, increased the British demand for bone even further. Yet by this time, most continental European states had not only highly regulated the collection of bones, they had also introduced export taxation. In addition, continental agriculturalists had started to realise that by allowing the mass-export of bone to Britain, they were robbing their own soil of nutrients that would be badly missed in the future.

All this led to a noticeable rise of bone prices on the continent, making this source less attractive for British bone merchants (although Europe, in particular Eastern Europe, remained a premier supplier), who started looking for sources further away, beginning to import animal bone from as far as south America and Africa, Egypt in particular, from where – in addition to “fresh bones” – thousands of tons of mummified animals and humans were imported to Britain to be unceremoniously ground down and spread over the fields.¹⁵

III. Bones for sugar, Noir Animal, Bone Char, Knochenkohle, Beinschwarz, Spodium

In 1747, the German chemist Andreas Sigismund Marggraf, in experiments subsidised by the Prussian government and Frederick the Great, discovered that beet contains the same sugar as sugar cane. However, the sugar content of the beet was too low to be able to produce sugar from it. His pupil Franz Carl Achard in Berlin then bred the sugar beet, managing to increase its sugar content from 1.6% to approx. 5%. This was the only way to obtain sugar from it economically.¹⁶ In 1805-1806, Baron Moritz von Koppy built a beet sugar factory

in Krain, Silesia. He received technical and scientific support from Achard. Through their cooperation and Koppy's idea of also utilising the “waste products” of sugar production, this factory developed into the first to generate profits. Within the next five-six years more than 200 sugar beet refineries opened in the German states, especially in Silesia, Saxony, Anhalt and Baden. From Germany the sugar beet industry carried over into France from about 1811. At the beginning of the 19th century, Napoleon Bonaparte had blocked the sea routes to England, and imported sugar from sugar cane had become scarce, yet with it he had given birth to the European beet sugar industry.¹⁷ In 1836/37, France already produced 49 million kg of beet sugar, or 6.4 pounds per capita, and in the meantime had far surpassed Germany in this respect. Importantly, the establishment of the beet sugar industry on the continent coincided with the revolutionization of agricultural cultivation methods. Artificial fertilisation with bone meal phosphate not only helped to spread sugar beet farming, fitting in well with the new crop rotation and allowing fertilisation on less nutrient-rich soils, it also increased the sugar content in the beets. In the following decades factories opened all over Europe, in Germany, Austria and the newly established Kingdom of Belgium. With prices dropping continuously, sugar became affordable for the masses and lost its role as a luxury item, gradually becoming a popular food and staple on everyone's tables.¹⁸

To produce the brilliantly white sugar demanded by the customers, and particularly from sugar beet, the sucrose-containing beet juice needed to be filtered. In 1785 the German-Russian Chemist Johann Tobias Lowitz discovered that charcoal can absorb odours and pollutants from water. By 1808, the European sugar industry used charcoal as a filtering agent but an important change

14. Agricultural Research Service D.C. “Soil and Water Conservation Research Division”, in *Superphosphate: Its History, Chemistry, and Manufacture*, n° 164, Washington, 1964, 27.

15. JIM ELSE & PHIL HAYGARTH, *Phosphorous: Past and Future*, Oxford, 2020, p. 60; HENRY VILLIERS-STUART, *Nile Cleanings. Concerning the Ethnology, History, and Art of Ancient Egypt*, London, 1879, 90.

16. GUNTWIN BRUHNS & JAKOB BAXA, *Zucker im Leben der Völker: Eine Kultur und Wirtschaftsgeschichte*, Berlin, 1967, 102-112.

17. JACOB BAXA, *Die Zuckererzeugung 1600-1850*, Hildesheim, 1973.

18. EDMUND OSCAR VON LIPPMANN, *Geschichte des Zuckers*, Leipzig, 1890, 719-748.

occurred in 1811 when the French industrialist Charles Derosne (1780–1846) introduced the use of granulated bone char, which had far better decolourisation performance.¹⁹ Only four years later, the entire beet sugar industry in Europe had switched to the use of the new material which in later years was best known internationally by its industrial name “spodium”.²⁰ With the rise of the beet sugar industry, bone char became a most valuable commodity. The by-products of sugar refining, one of them being superphosphate, increased its value even more. The huge demand for it increased the value of raw bone to levels never before seen.²¹

All over Europe, and in particular in the territories in which the great sugar refining industries were doing their business, people again rushed out to harvest bone from wherever it could be found and carried it to independent kilns, or directly to the beet sugar refineries, all of which operated their own bone-char kilns. “The animal coal”, stated a German newspaper in 1841, “is a necessary material for the production of sugar from the beet, and it should not go unnoticed how useful this very circumstance proves to be. Often one came across fields covered with skeletons; the bones of the slaughtered animals were worthless waste. The production of beet sugar has made it the material of an important industry. Bone collecting employs a not insignificant number of poor people, and in Thuringia there are 8 to 10 bone kilns, which draw large sums of money into the country for otherwise worthless waste. The price of raw bones has risen from 7 to 22 1/2 guilders and the demand for them is so strong that it is no exaggeration to call bones the most sought-after article”.²²

IV. Bones from Battlefields

Over the course of human history there have been a multitude of uses for bone. Yet in the previous chapter we have shown how agricultural innovation and scientific discoveries gave rise to two major “bone-consuming” industries which led to a never-before-seen demand for raw bone. An often-discussed question is, if human bone was equally harvested and if the graves on old battlefields, those of the Revolutionary and Napoleonic Wars in particular, were opened and emptied.

The wider public first learned about that theory from an anonymous letter published by *The Times* on 18 October 1822. The author, who signed under the alias “a living soldier”, stated that: “It is estimated that more than a million of bushels of human and inhuman bones were imported last year, from the continent of Europe, into the port of Hull. The neighbourhood of Leipsic, Austerlitz, Waterloo, and of all the places where, during the late bloody war, the principal battles were fought, have been swept alike of the bones of the hero and of the horse which he rode. Thus collected from every quarter, they have been shipped to the port of Hull, and thence forwarded to the Yorkshire bone-grinders, who have erected steam-engines and powerful machinery, for the purpose of reducing them to a granular state. In this condition they are sent chiefly to Doncaster, one of the largest agricultural markets in that part of the country, and are there sold to the farmers to manure their lands”.²³ The letter, which the author ends with the wish that he “may not be sold alive for manure”, spread like wildfire and within the matter of a two weeks had been published, more or less edited,

19. In French, *Noir animal*, a material produced by kiln-charring animal bones. AUGUSTE DE ROMANET, *Du noir animal, résidu de raffinerie: de sa nature, de son mode d'action sur les végétaux et de son application au défrichement des terres incultes du centre de la France*, Paris, 1852, 7.

20. Latin for soot. HENRI FOURNIER, *Cours élémentaire de chimie*, Paris, 1905, 498.

21. Anonymous, *Preußische Statistik: Amtliches Quellenwerk*, Prussia, 1860-1867; Anonymous, *Jahresberichte der Handelskammern und kaufmännischen Korporationen des Preussischen Staates*, Berlin, 1860-1867; AUGUST GOTTFRIED SCHWEITZER, *Darstellung der Landwirtschaft Großbritanniens*, Leipzig, 1839, 490-491; AUGUST SCHIEBE, *Universal-Lexikon der Handelswissenschaften*, Leipzig, 1839, 185.

22. Anonymous, *Allgemeiner Anzeigen und Nationalzeitung der Deutschen*, No.81, 23 March 1841, 3.

23. *The Times*, 18 October 1822.

in most newspapers on the British Isles. But not only that, it also swept over to the continent where first translations into Dutch, English and French were published at about the same time.²⁴ For the next decades, a plethora of authors all over the world, would use the “living soldier’s” letter again and again to illustrate how far Britain would go to supply the country with bone fertiliser. In the following years a small number of similar reports were published in England, all of which would be often quoted from in the decades to come.

The letter of the “living soldier” and other similar accounts published later, are today sometimes discounted for being sensationalist and fictional, while on the other side the fact that huge demand of bone meal is often used as the all-encompassing answer to the question why no large mass graves from the Napoleonic Wars have been found so far, not only at Waterloo. It seems odd that in the quest to answer this question, no serious research has so far been done using available German, French, Dutch and Belgian sources. Surely the evidence to support or negate the observations of the “living soldier” can be found in the places from where he claims the bones had been taken?

We have already outlined the intensity of the “bone rush” of 1819 and the following few years. Again it is the same sources, newspapers, gazetteers, trade journals and compilations of local laws and regulations which hold the evidence.

The earliest evidence that human bone was collected and quite possibly also offered for sale, is again found in the *Lübeckische Anzeigen*, in an advertisement of a bone merchant dated 7 April 1819. In the advertisement it is announced that: “All those who have bones lying around, who know how to procure such bones, or who feel like looking for them, may they be of any kind, dry

or not dry (just no human bones), no matter from which animal it may be, are hereby requested to hand them in from 9 o’clock in the morning until 6 o’clock in the afternoon at the Hoffnung in the Engelsgrube No. 61, against payment”.²⁵

Surely there would have been no need to point out that human bone would not be bought, if there was no such commodity on offer.

Some rather grisly events seemed to have played out in front of the town walls of Hamburg: “A different business is digging and picking up bones which are going to England by the shipload and are being well paid for there.” reports the Hamburg correspondent of German newspaper in December 1821 and continues to say that: “After the siege this business was very fruitful, especially in one place where 15,000 Frenchmen had been lowered into the ground. In the early morning one could see the bone collectors in their hundreds, with pickaxes and spades and supplied with roomy sacks, rushing out of the gate and out into the fields where the French were lying, and no interdiction of the authority could put a check on this atrocity; because if one arrested these busybodies for a short time, they were happy about it, as by doing so the need to procure for their miserable existence was taken from them, and as soon as they were released, they happily continued with their accustomed work, so that the authority finally got tired and let them proceed undisturbed, until the supplies had been exhausted, which seems to have come to pass now”.²⁶

While the number of 15,000 burials seems absurdly high, there is little reason not to believe that these events took place as described. In Hamburg-Ottensen one of the many mass graves dating to the period of the 1813-1814 siege survives up until today and it contains the

24. *Allgemeine Handlungs-Zeitung*, Nuremberg, 27 November 1822, 584; *Groninger Courant*, 29 November 1822, 1; *Le Figaro*, 27 February 1826, 2.

25. *Lübeckische Anzeigen*, N^o. 28, 7 April 1819, 1.

26. *Morgenblatt für die gebildeten Stände*, 10 December 1821, 1179-1180.



Bodies of dead soldiers being gathered at La Haie Sainte (credit James House, aquatint, London, 1817).

remains of 1,138 people.²⁷ 42,000 men strong at the beginning of the siege, the decimated French garrison pulling out of the city in May 1814 numbered about 25,000 men.²⁸ Thousands succumbed to hunger and disease. In addition, at Christmas 1813, Marshal Davout had driven 30,000 Hamburg citizens out of the city, as he was unable to feed them. Thousands of them perished from hunger and in the freezing temperatures. It is certainly believable that a large number of these human remains found their way into English bone mills. There can be no doubt that “the living soldier” indeed saw human remains gathered on battlefields. Surely he could not know from where exactly they had come, but Leipzig (the largest battle of the Napoleonic Wars in which 560,000 men had fought), Austerlitz (one of the most important and decisive battles of the wars) and Waterloo (the most recent battle fought with British participation which ultimately set an end to the age of Napoleon), were household names in public perception and remembrance and as such were an obvious choice.

There is firm and undisputed evidence that bones from the battlefield of Leipzig were industrially harvested and processed from quite early on. In 1822, Maximilian Speck (from 1829 Freiherr Speck von Sternburg), a successful entrepreneur, merchant and animal breeder, acquired large tracts of land on and a knightly manor on and around the fields on which in 1813 the “Battle of the Nations”, the Battle of Leipzig, had taken place. A regular visitor to London, he did not fail to notice the huge amounts of bone meal and bone being loaded and unloaded in the city. In September 1824 he wrote: “As I have my own commandite store in London and a house on the Thames, I have been able to judge with my own eyes the number of shiploads of bone meal arriving there from the mainland, used only for fer-

tiliser, which last year amounted to 40,000 tons. Would this be possible if bone meal were, as its opponents claim, an insignificant, low-density substance? (...) A continuous series of experiments on my manor of Lützschena near Leipzig, and on the premises of several thinking farmers who, like me, work on this subject, finally cleared up the whole matter, and showed that where fertilisation showed no great success, either boiled bones of soap boilers were used, or such as had been robbed of their fat and animal glue by lying in the earth for a long time on battlefields or knacker’s yards. I had a bone-mill of a smaller kind brought to me from London, which, powered by a man, like a hand-grinder, is now in continued use with me, and now, since I take only fresh bones, yields a yield far exceeding both the cost of the mill and the cost of the grinding”.²⁹

By then Speck von Sternburg still believed in the common, but erroneous theory that the fertilisation value of bone rested in its “wet” parts, the marrow, sinews, and other fleshy components. He did not take long however to come to a different conclusion which he again described himself in his book *Landwirtschaftliche Beschreibung des Ritterguts Lützschena bei Leipzig* in 1842: “In order to obtain as good and quick a yield as possible from the fields and gardens, and to increase the number of cattle, a bone mill was ordered there by the owner on his visit to London in 1824, when he acquired Lützschena, and was erected here for the purpose of manufacturing bone meal. The production was eagerly pursued, and the result was a favourable one. The bones were mostly supplied by poor people who collected them in considerable quantities in the area around Leipzig, where in 1813 many thousands of the fallen warriors had been buried and buried barely a few feet deep in the ground. The price of the bones increased steadily; at last even boiled

27. *Die Heimat*, Vol 13, Hamburg, 1903, p. 64 and HELMUT STUBBE DA LUZ, “Vergegenwärtigung – Trauerkultur – Zukunftsperspektiven. Bemerkungen zur Ausstellung 30.000 vertriebenen Hamburger (1813/14) – Das Ende der Hamburger Napoleonzeit in Denkmälern”, in *OZT* Nr. 111, IV/2010, 8-10.

28. FRIEDRICH VON MUEFFLING, *Feldzug der kaiserlich-russischen Armee von Polen in den Jahren 1813 und 1814*, Hamburg, 1848.

29. MAX SPECK, *Mittheilungen der K.K. Mährisch-Schlesischen Gesellschaft zur Beförderung des Ackerbaues*, 1824, 286-287.

and weather-beaten bones were brought in. Meal production was slowed down and finally stopped altogether, and the mill was sold to Silesia”.³⁰

Even though von Sternburg kept his statements vague enough and did not specifically state that human bone was dug up, it is clear that bones from the Leipzig battlefields, animal and/or human, were extracted there. Another of Sternburg’s remarks in the same text is equally important here, as at the time of the publication of his book the harvesting was still ongoing seventeen years later, although by then for a different but more important client, the beet sugar industry: “The largest quantity of bones now sent from Leipzig to Magdeburg and Hamburg is destined for the sugar refineries, and they are well paid for”.³¹

As described above, only about a decade passed before new laws, regulations and taxation made the harvesting of bone for export to the British fertiliser industry less attractive and uneconomical. Yet by then, the European sugar industry had risen and its refineries and kilns were demanding bones which could be turned into bone char. One can still find reports about bone shipments from battlefields heading to Britain via the German trade ports, like this one published by a newspaper on the Island of Rügen in 1834: “An English ship, has lately brought two to three hundred barrels filled with the bones of French soldiers and horses who have perished during the retreat of the Great Army from Russia, to England”.³²

Yet more and more reports about bones taken from historical sites and battlefields now mention sugar and *noir animal*, bone char or spodium.

The trade in human bones was and remained a shady business, but hiding it was not too difficult, in particular after the bone had been broken and turned into charcoal. There are too many cases to

list them all here, and most are beyond the scope of this paper, but there is no doubt that human bone from a large variety of sources was used for the production of fertiliser and in the bone kilns of the beet sugar refineries. In Britain the supply was supplemented by local sources and imports from all over the world. Yet it can be said with some degree of certainty, that the human and animal graves on the continental battlefields were not cleared during the early ‘bone rush’ sparked by the British demand of bone meal fertiliser, but survived much longer than previously thought, being finally destroyed by modern farming and another, newly emerging industry.

V. The Case of Belgium

The case of Waterloo needs to be opened with a remark that evidence concerning the widespread exploitation of the bones of those killed on 18 June 1815 are almost non-existent before the 1830s. The prevailing story today, that human remains were ground into fertiliser powder, seems impossible to verify at present. In addition to the famous letter of the “living soldier”, only one or two articles in the international press of the time mention that it happened. In 1825 the *German Zeitungs und Conversations Lexikon* stated that: “In the Netherlands, they cleaned the bones of thousands of horses from the Waterloo battlefield. Some went to England, others were burnt and crushed” and finished with a rather prophetic prognosis for the future: “The next generation will not spare the mass graves and will turn their substance into vegetation”.³³ It is not impossible that bones, horse bones in particular, were removed shortly after the battle or in the decade that followed. However, caution must be exercised given the lack of factual evidence and local sources. In any case, there is no evidence of large-scale exploitation between 1815 and 1832. There is not a single reference of important dis-

30. MAXIMILIAN SPECK-STERNBURG, *Landwirtschaftliche Beschreibung des Ritterguts Lützschena bei Leipzig, mit seinen Gewerbszweigen*, Leipzig, 1842, 73-74.

31. *Idem*, 73-74.

32. Anonymus, *Constitutionnelle Staats- und Bürgerzeitung und Insel Rügen*, 26 August 1834, 544.

33. *Zeitungs und Conversations Lexikon*, volume 2, Leipzig, 1825.

Year	Exports in kilos to France
1832-1833	0
1834	350.000
1835	2.000.000
1836	3.000.000

Tabel 1. Exports of bones from Belgium to France, 1832-1836. Based on the figures given during the debates of the *Chambre des représentants*, 1832-1836.

turbances in the writings of visitors in the 1820s, which would be unthinkable if mass graves had been dug and there is not a trace of any illegal exhumation in the local archives.³⁴ There is however evidence that tourists were sometimes eager to purchase bones as souvenirs when visiting the battlefield and that parts of the local population were eager to supply these gruesome keepsakes for a quick profit.³⁵ In a letter, a French writer recorded his conversation with a farmer from Braine-l'Alleud: "He explained to me how he obtained them [the bones of the dead]. "You see, he said, while pointing out a large rye field on the right; the corn is not of the same colour; some stems of a darker green, more black than the others: that is where the pits are. It is the same almost everywhere on the plain. When we want a few bones, a few skulls, we mark the place, wait for the evening and we dig".³⁶ Although shocking, this clearly demonstrates that the locals knew exactly where the mass-graves were located and that they were still largely untouched as late as 1829.

Far more decisive for the corpses of Waterloo is the period beginning in 1833-1834, a period which corresponds to the explosion of the sugar industry in Belgium and the development of sugar beet cultivation. It seems crucial to contextualise the Belgian bone market on a national scale and the general trends observed over the years.

On 14 September 1824, a parliamentary resolution prohibited the export of bones, with the exception of those from which the gelatine had been previously extracted.³⁷ This measure was intended to protect the manufacturers of gelatinous glue, which was particularly popular in cabinet making. At the time, the value of bone was very low and it was, as everywhere in Europe, mostly harvested by the poorer classes. The situation changed in the early 1830s, when the price of this special raw material exploded. On 28 January 1833, a citizen of Liège petitioned parliament to lift the export ban of bones abroad.³⁸ A few years earlier, one hundred kilos of bones sold for two francs, whereas the average price in 1833 had risen to 7.5 francs. The sale abroad was all the more interesting as the French taxed the export heavily, more than 20 francs per hundred kilos.³⁹ On 25 March 1834, a new law liberalised the bone trade abroad, although it was still subject to a tax of 5 francs per thousand kilos, an anecdotal sum compared to that imposed by France.⁴⁰ This was a pivotal period in the trade, as Table 1 demonstrates.

As can be seen, these data, taken from parliamentary debates, illustrate the explosion of the bone market in France, where the industry turned bones into *noir animal*, or bone char, to be used in the sugar industry. As the liberal parliamentarian Léopold Zoude summarised: "The beet

34. See for example: MARIE BODDINGTON, *Slight Reminiscences of the Rhine, Switzerland, and a Corner of Italy*, London, 1834, p. 30 or DOROTHY WORDSWORTH, *Journals of Dorothy Wordsworth*, London, 1941, 29-30.

35. JOSEPH MÉRY, *Napoléon en Égypte, Waterloo et le fils de l'homme*, Paris, 1842, 270.

36. MÉRY, *Napoléon en Égypte*, 270.

37. *Chambre des représentants*, 14 September 1824. Debates consulted online at unionisme.be [consulted 8 August 2022].

38. *Chambre des représentants*, 28 January 1833.

39. *Chambre des représentants*, 25 March 1834. *Pasinomie ou collection complète des lois, décrets, arrêtés et règlements généraux qui peuvent être invoqués en Belgique*, Bruxelles, 1834, 79.

40. *Idem*, 79.

sugar factory requires a very considerable use of noir animal: the quantity it needs is one third of the weight of the sugar produced. Thus, from the first year, these establishments need half a million pounds of bone char, which represents one million kilograms of bone".⁴¹ Unsurprisingly, this demand led to a lot of fraud. The same representative declared: "The export is much higher than the declared quantities, and however exact and rigorous the surveillance at the border offices may be, it is impossible to prevent the fraud that is committed; this fraud, states the Tournay Chamber of Commerce, results from the difficulty of controlling the declarations on exit. Stinking bones are exported in full loads, without packaging and in a way that makes verification almost impossible".⁴² The explosion in exports went hand in hand with a notable increase in domestic demand. As early as 1833, numerous sugar factories were set up in Belgium. Parliamentarians were the first to complain about the departure of the nation's bones to France, where sellers obtained a much higher price. François Donny, a catholic member of the Catholic Chamber and a representative of Ostend, used the example of a factory in his native city to illustrate the shortage that was affecting the country: "It works according to processes imported from England, consumes a very large quantity of bones and sells products that are so satisfactory that it has won medals at every industrial exhibition. Well, the owners of this factory write to me that if the present order of things continues, they will be obliged to close their factories, and this because of the extreme difficulty they are experiencing in obtaining the raw material they need"⁴³.

VI. A Sea of Beets

In 1834 and in the years that followed, the sugar industry was established in the Waterloo region. The location, rural but close to the capital, well connected to the road network and surrounded by fields, was ideal. Immediately, the farmers began to transform the landscape of the battle-field. A table of crops in Braine-l'Alleud in 1827 shows that wheat, meslin, rye, barley, oats, potatoes and buckwheat were the main crops grown at the time.⁴⁴ Eight years later however, sugar beet became the king. This phenomenon is admirably recounted by a traveller in the newspaper *L'Indépendance belge*: "I raise my eyes; I rub them, to be sure that I am not the plaything of the illusions of my sleep. No more forest! No more great trees embracing this last arena of nations like an immense enclosure! No great road stringing along as far as the eye can see between the robust trunks! Just a single plain, the earth flattened everywhere, the sky astonished to see it bare, and separated with a straight line on the horizon! – "What does this mean," I cried, shaking my excellent friend, who had begun to catch up on some good sleep? – "What's the matter?" he answered drowsily – "It is that I can no longer see the forest." – "You can see it half a league away." – But around the plain of Waterloo? – Cleared. – Cleared! And since when? – For over four years, to plant beets. – Beets? What for? – To make sugar. [...] Beets where the great secular trees stood, under which the nations clashed to make the destiny of a great man! Beets in the place of a magnificent historical forest. If only it were wheat!

41. Chambre des représentants, 3 December 1836. *Pasinomie ou collection complète des lois, décrets, arrêtés et règlements généraux qui peuvent être invoqués en Belgique*, Bruxelles, 1837, 196. Léopold Zoude (1771-1853), was a liberal representative from Neufchâteau. He seated in several agricultural commissions from 1833 to 1853. Jean-Luc De Paepe and Christiane Raindorf-Gérard (eds), *Le Parlement belge: 1831-1894. Données biographiques*, Bruxelles, 1996, 632.

42. Chambre des représentants, 3 December 1836. *Pasinomie ou collection complète des lois, décrets, arrêtés et règlements généraux qui peuvent être invoqués en Belgique*, Bruxelles, 1837, 196.

43. Chambre des représentants, 13 April 1837. François Donny (1791-1872), was a member of the union party and after 1847 the catholic party. He was also a lawyer and an *avocat general* at the Court of appeal of Gent. JEAN-LUC DE PAEPE & CHRISTIANE RAINDORF-GÉRARD (eds), *Le Parlement belge: 1831-1894. Données biographiques*, Bruxelles, 1996, 272.

44. Archives de l'État à Louvain-la-Neuve, Archives de la commune de Braine-l'Alleud, registre de la correspondance sortante du bourgmestre, 22 April 1828.

Man has to eat, and in his insatiable need he would plough to Calvary. But for sugar! To have mutilated the greatest memory of modern history for sugar! He who has fought by the beet will perish by the beet. This is the fruit of your continental blockade, O great Napoleon".⁴⁵

In addition to the cultivation of beets, a gigantic sugar production factory was created, pompously called the "National Sugar Refinery", located near the Tervuren road in Waterloo, less than five kilometres from the battlefield.⁴⁶ Another factory was set up near the *Drève du moulin*, west of the town of Waterloo. Independent bone charcoal factories were also located nearby. This phenomenon is not unique, as there was also a bone charcoal factory in Fleurus, in the immediate vicinity of the areas where the battles of Ligny and Fleurus were fought and near where the battle of the Quatre-Bras was fought.⁴⁷

The sources show that the sugar industry was present in force where Wellington and Napoleon once clashed and it had to fight to find a raw material that had become expensive, rare and the subject of international trafficking of a kind that was denounced even in the Belgian parliament. These clues already allow us to guess at the fate of many of the fallen soldiers on the Waterloo Plain, but concrete facts remain to be provided. The French press of the time is full of rumours concerning the trafficking of bones from the "Morne Plaine". *L'Indépendant* of 23 August 1835 mentions the following fact: "A company of industrialists has just bought permission to excavate the battlefield of Waterloo, in order to remove the bones of the dead, which are piled up there in such large num-

bers, and to make bone char. To remove the bones of the brave lying dead on the field of honour, to make bone char. A single fact of this kind is enough to characterise an era".⁴⁸ Other titles evoke these speculations, such as *La Presse*: "One experiences the feeling of disgust and shame with which the peasants of Waterloo blush, when they see speculators who sell noble bones scattered on the battlefield, and which they intend to transform into bone char" or the *Echo du Commerce*: "Every day we see convoys of carts loaded with materials suitable for making animal coal passing through the gates of Mons and coming from abroad. Bones are sold at a high price in France, especially in the department of the North; Belgium also sends them to us en masse. All these convoys are heading for the animal coal factories, whose products are necessary for our beet sugar factories. The shops for the bones that are transported there rise up in the open sky, and the eye is not a little surprised at the sight of these high pyramids, such as we see at Marly, all built of animal remains, in the middle of which we do see human remains all too often. Where do these heaps of debris come from? There is more than one battlefield on the Belgian frontier where the earth covers thousands of dead; at Waterloo especially, the number was great [...]"⁴⁹

It would be astonishing if so many stories were born solely from the fertile imagination of journalists. However, it takes more than that to confirm the shocking hypothesis of the systematic exploitation of the bones of the Waterloo dead. It is in the municipal archives of Braine-l'Alleud and Plancenoit that we find that missing evidence, several reports and letters exchanged between different administrative levels. A first report, hinting

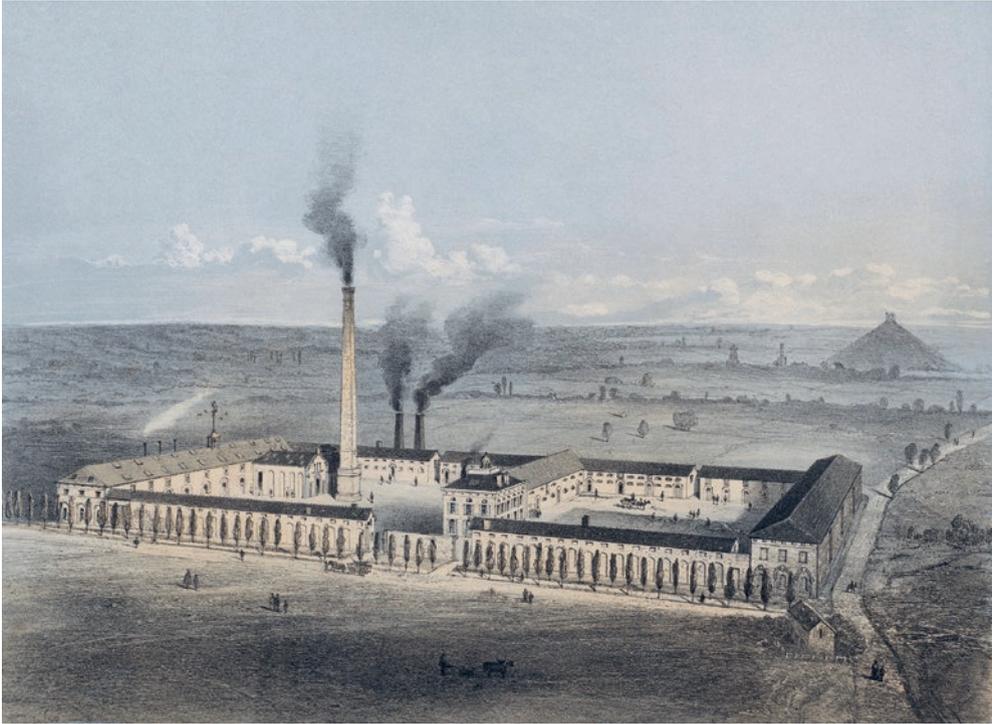
45. *L'Indépendance belge*, 17 December 1838, 1.

46. *Le Journal de la Belgique*, 31 January 1836, 2. The *raffinerie nationale de sucre indigène et exotique* was not a successful operation. The factory closed in 1845, but opened again in 1851. Taken over by François Capouillet, one of the leading actors of the sugar industry in Belgium and the mayor of Waterloo from 1861 to 1873, it remained a sugar factory until 1871. Rumours that it did not produce sugar need to be dismissed. As the press of the time showed, tons of sugar were sold on a monthly basis in Brussels or shipped to Hamburg. *L'Indépendance belge*, 13 August 1845, 3, *Le Belge*, 12 October 1837, 4 and *L'Émancipation*, 16 February 1837, 2 and 1 January 1854, 2 and JEAN BARTHÉLEMY, "Conservation et réaffectation du patrimoine industriel en Wallonie" *Les cahiers de l'urbanisme*, n° 12, September 1994, 10.

47. Carte de Vandermaelen, 1846-1854. <http://geoportail.wallonie.be> [consulted 8 August 2022].

48. *L'Indépendant*, 23 August 1835, 1.

49. *La Presse*, 16 April 1838, 1 and *L'Écho du commerce*, 13 August 1835, 2.



Idealized view of the sugar factory of Waterloo (credit Jules Géruset, La Belgique industrielle, Brussels, 1852).

at illegally dug fields, was sent to the *Juge d'instruction* of Nivelles in April 1834. The mayor of Braine-l'Alleud stated that "it is impossible to identify the perpetrators without sufficient evidence to convict them".⁵⁰ Other reports reveal illegal excavations in the mass graves of Braine-l'Alleud and Plancenoit in April 1835. The burgomasters [mayors] were obliged to inform the superior authority, the district commissioner⁵¹. The latter asked the local authorities to contact the gendarmerie commander in Waterloo in order to put a stop to this activity, which was punishable under the criminal code (article 360).⁵² The reaction of the mayor of Braine-l'Alleud is particularly interesting. He took the main measure of drafting a proclamation that he had posted in his commune and in neighbouring entities. It deserves to be reproduced in full: "The Mayor. Excavations to dig up bones in the battlefield of 1815 having been carried out, the undersigned has been enjoined to inform the inhabitants of his commune and neighbouring communes that these acts are one of those contained in article 360 of the penal code and punishable by imprisonment for three months to one year and a fine of 10 francs to 200 francs. Consequently, the owners and cultivators of the land situated in the battlefield must not violate or allow the violation of the burials made on their property and the administrative authorities and the judicial police officers are invited to watch for offences of this kind which could still be committed in the future".⁵³ It is striking that this notice is addressed to landowners and farmers. These were the most likely to dig through the soil unnoticed. It is inevitable that, so soon after the battle, they will have been confronted

with numerous human remains, and mass graves. This is all the more plausible because sugar beets require particularly deep ploughing to grow, as parliamentarian Desmet explained: "In order to grow sugar beet well, the land must be ploughed very deeply and carefully".⁵⁴

Other sources from the Belgian authorities would have made it possible to document the consequences of these illegal exhumations more accurately. Unfortunately, the archives of the Waterloo gendarmerie, as well as the reports of the district commissioner, have been destroyed. Nevertheless, there is sufficient evidence to suggest a systematic trade. More can be learned from the writings of various foreign witnesses, such as Dr. Karl von Leonhard, a renowned German geologist from Rumpenheim, who visited the battlefield around 1840. Near the farm of La Haie Sainte, he was surprised to see open pits with several people working on them: "Gates and doors of the heights and gardens of the Haie-Sainte bore bullet marks everywhere, under one of the sheds: mighty piles of horse bones; in the fields, opposite the tenant farm, deep trenches stretched far out, filled with corpses of humans and animals (...) From time to time, the graves had been dug up; Brussels merchants had been trading in "Waterloo bones" for some time. The natives, however, only admitted to selling the bones of horses to the speculators. One of the workers, wielding his shovel however, praised the bones of the Guard Grenadiers as particularly worthy of a prize as; according to his assurance, they weighed as much as those of horses".⁵⁵

50. Archives de l'État à Louvain-la-Neuve, archives de la commune de Braine-l'Alleud, registre de la correspondance sortante du bourgmestre, 4 April 1834.

51. *Commissaire d'arrondissement* in French. Archives de l'État à Louvain-la-Neuve, archives de la commune de Braine-l'Alleud, registre de la correspondance sortante du bourgmestre, 7 May 1835.

52. Archives de l'État à Louvain-la-Neuve, archives de la commune de Braine-l'Alleud, registre de la correspondance sortante du bourgmestre, 3 July 1835. Article 360 of the Penal Code punished illegal grave violations and was inspired by the French Penal Code of 1810, still used in Belgium in an edited form. FRED STEVENS, "La codification pénale en Belgique, héritage français et débats néerlandais (1781-1867)", in XAVIER ROUSSEAU & RENÉ LÉVY, *Le pénal dans tous ses états*, Brussels, 287-302.

53. Archives de l'État à Louvain-la-Neuve, archives de la commune de Braine-l'Alleud, registre de la correspondance sortante du bourgmestre, 13 July 1835.

54. Chambre des représentants, 13 April 1837, debate reproduced in *Le Belge*, 15 April 1837, 2.

55. KARL VON LEONHARD, *Aus unserer Zeit in meinem Leben*, Stuttgart, 1854, 474. A very similar testimony was written by Edgard Quinet in the *Revue des deux mondes: recueil de la politique, de l'administration et des mœurs*, 1 October 1836, 36.

Since the burgomaster had threatened his constituents about exhumations in 1835, it is unlikely that they would admit any more openly to the dubious transactions they were engaging in when facing a foreign traveller. As can be seen, the logistics were not overly complex; all that was needed was manpower, shovels and carriages for the transportation of the bones. After all, the human body, once decomposed, was only a fraction of its original weight, nothing that sturdy agricultural workers could not handle. The fact that Brussels merchants are mentioned is particularly interesting. The Waterloo sugar factory was controlled by industrialists from Brussels, and products were sold in the Belgian capital. A few fragments of the accounts of the Waterloo sugar factory, the *Raffinerie nationale de sucre indigène et exotique*, have survived and are now kept in the General Archives of the Kingdom of Belgium. They show that in 1844-1845, the factory had all the equipment needed to manufacture spodium, including a bone furnace, and that at the time the accountant wrote his report, there were nearly 19 tons of bone charcoal in stock.⁵⁶

While local sugar factories were producing tons of products and spodium, the *Allgemeine Militär-Zeitung*, a respected military periodical of the time, pointed out in an 1846 article on the Waterloo battlefield that most mass graves had gone: “The old chateau of Hougomont, captured and lost by the French three times in a row within 5 hours, is sadly entirely destroyed in a way that did not allow even to think about a reconstruction. Here the dead, French as well as English and Belgian, formed a dam 30 paces wide and 10 to 12 feet high. The huge graves, which here, as well as on other spots of the battlefield, took in the many thousand dead,

can now only be spotted with some effort. Agriculture has levelled most of them”.⁵⁷

Another testimony, from a French citizen, was published in the very serious *Journal des connaissances médicales pratiques* in 1858. The author, Dr Caffé, who had lost a brother in the Battle of Waterloo, stated the following: “I do not forget to have seen the same excavations carried out at Waterloo, where I had the misfortune to lose a brother. And the bones, transformed into animal black, went to clarify the beet sugar of Belgium and the northern departments”.⁵⁸

Not all tourists witnessed such illegal activities but most had heard of it. Edmond Texier, a French poet and writer, toured the battlefield around 1850, an experience he described in a book: “When the ground was disturbed in the years following the battle, the bones were extracted by the hundreds of cartloads and were used, they say, but I think this is a slander, to make *animal noir* to refine this same sugar which grows at the foot of the monument”.⁵⁹ Texier, a Parisian intellectual removed from the rural realities, refused to believe in what was already perceived as a shocking industrial behaviour.

However, the trade in human remains should not be seen as a great cabal, but rather as the desire of the poorest of the region to improve their daily lives by making use of a much sought-after and abundant resource. The weight of the bones of 10,000 soldiers and 10,000 horses (a low estimate, but it is not our aim to debate the precise number of victims at Waterloo) is approximately 1,700,000 kg.⁶⁰ Knowing that in 1837, 100 kg of raw bone sold for 14 francs, there were there-

56. Archives Générales du Royaume, Archives of the Société générale de Belgique, n° 3480: Comptes de la fabrique de sucre de Waterloo, 1844-1845.

57. *Allgemeine Militär-Zeitung*, 21 July 1846, 4.

58. *Journal des connaissances médicales pratiques*, 1858, 614.

59. EDMOND TEXIER, *Voyage pittoresque en Hollande et en Belgique*, Paris, 1857, 337.

60. On casualties, see for example GARETH GLOVER & MICHAEL CRUMPLIN, *Waterloo: After the Glory: Hospital Sketches and Reports on the Wounded after the Battle*, Warwick, 2019, 79. On animal and human bones, see MARIE BALASSE, JEAN-PHILIP BRUGAL, YANNICK DAUPHIN, EVA-MARIA GEIGLE, CHRISTINE OBERLIN & INA REICHE, *Message d'os: Archéométrie du squelette animal et humain*, Paris, 2015.



La Haie Sainte around 1860 (credit Wouter Lambrechts).

fore a maximum of 238,000 francs to be earned, a small fortune for the time – and easily earned on the plains of Braine-l'Alleud and the surrounding area.⁶¹ The mayors had no interest in putting an end to this lucrative industry, which enriched their citizens and the region. One may wonder whether the notice published in 1835 was not written to appease the international press, which was shocked by the practice. In any case, it is clear from Leonhard's testimony and that of other tourists that the looters of the graves do not seem to have feared the authorities. In fact, there is no mention of any arrest for grave robbery in the press at the time.

Large scale extraction of bone from former sites of battle seems to have stopped towards the end of the 19th century. Other techniques meant that the sugar industry was no longer dependant on these organic remains. In the region of Waterloo however, the memory of the activity itself was retained in public conscience. In 1942, Franz Bünthe was a soldier in the German army stationed in Brussels with the army of occupation.⁶² His main task was to guard Russian prisoners employed in agricultural work in the region. A historian by profession, he was a keen art collector and had a deep interest in past events. In a letter to his family, he recounted the following facts:

26 March 1942

My dear Gerdi,

Now I have time once again to write you a few lines. I am sitting here with a cup of good bean coffee and a sandwich spread with butter as thick as a finger. Just the way I like it. After we had been in the fields again for four days with our Ivans, we got two days off with the whole platoon afterwards. In Brussels I was marginally successful and got a very nice sheet for our collection. Napoleon at Arcole by Longhi.

It was not expensive and I spent a nice afternoon with the dealer, who showed me parts of his own collection. A lot of junk but also some nice pieces. A mezzotint by Rubens with wife and child really appealed to me. Maybe I can continue the negotiations in the coming weeks. As you can see, it's not so bad here. You just have to know how to keep busy and I can fully satisfy my passions here. A few days ago we did our work near Ligny, where the old Marshal Blücher fought so bravely in 1815. The farmer there showed us a zinc bucket full of horse-shoes, lead and iron balls, buckles, buttons, etc., all objects that had come to light during field work. The good gentleman then gave each of us two lead balls and some French buttons. We repaid him with some cigarettes. The next day we drove the horse team from Genappe to Plancenoit and visited the Prussian monument. It marks the spot where in 1815 the Prussian army put Napoleon's guard to flight and thus decided the Battle of Belle Alliance. Without the intervention of brave Prussians, the French would have beaten the English decisively. Our guide also pointed out to us the spots along a stream south of the monument where the Prussian fallen found their final resting place after the battle. Here is a rough sketch, would you be so kind as to show it to Fritz Gerlach when you see him at Mertens? He is supposed to come here soon and this will certainly interest him. By the way, he hasn't written for a long time, so maybe you can take the opportunity to ask him if he has forgotten me. And another thing, the guide then told us that the Prussians are still resting there, because the Prussian government has employed some men in the village as guards. The poor people, and above all the Jews from Brussels, namely dug up the bones of the English and French dead, sold them to the Spodium factories and made a lot of money with them. Money rules the world. I sent you two packets of cigarettes. One with 150 and

61. Calculation based on the prices mentioned in the debates of the *Chambre des représentants*, 1837. A kilo of bread was worth 24,26 centimes in 1846. *Le Messager de Gand*, 16 December 1846. It should be reminded that hard physical labour was a reality for most people at the time. Digging up bones was far less labour intensive than burying corpses, thanks to decomposition.

62. Franz Bünthe was born on 13 November 1912. He survived the Second World War.

one with 80. The first one is for you and Meta. You can give the others to Gertrud. We recently got a lot of marketable goods, so much stuff that we don't know what to do with it. There was also more than enough to drink, but we drank it all in one evening, including a lot of scary stuff. It's a good thing I don't drink alcohol. It was not a pretty sight. Has the ham actually arrived? If not, let me know, there's plenty of everything here and I'm sure I can get another. I'm going to have to call it a night. Greetings and kisses from your Chubby.⁶³

It is clear that this German soldier, despite holding typical antisemitic views, had an above-average education. He was an art collector, a history enthusiast and could converse with Belgians in French. His guide was obviously a local with a good understanding of the battlefield, as the many accurate details in Franz Bünthe's account testify. In Placenoit, there was indeed a guard paid by the German authorities during the 19th century, a fact recorded extensively in files now stored at the Geheimes Staatsarchiv Preußischer Kulturbesitz in Berlin.⁶⁴ The stream south of the Prussian monument exists and is close to the location where at least five skeletons were discovered decades ago.⁶⁵ Moreover, no one at the time could have known about the bones' fate aside from someone with close connections to this illegal trade. After all, the history books were silent on the matter and the archives were closed to the public. It seems clear that Franze Bünthe was only able to learn about human remains being converted into spodium from a member of a family living in the area for generations. It should be remembered that in 1942, the child or the grandchild of a farmer active in the 1850s and 1860s could still have been alive.

VII. Archaeology

As the foregoing has made clear, the documentary evidence for the removal of human and animal bones from European battlefields in the 19th century is compelling, especially in relation to the Napoleonic era. For the first two decades of the 19th century, the exploitation of these sites of mass death as a source of bones was motivated by their use in the production of fertiliser.⁶⁶ The research reported here has shed more light on this trade but it has also identified a dramatic shift in the use to which bones were put beyond the 1820s, which was accompanied by an intensification in demand for them. After this time, crushed and carbonised bone, or bone char, played a vital role in refining sugar beet into the granulated, white sugar we are all familiar with today. With the recovery of this information from various archives and other sources in Belgium, Germany and France, written sources can be assessed alongside the results of archaeological investigations, most notably those which have taken place at Waterloo.

In 2015, the first of what were to become annual archaeological investigations on the battle site of 1815 was carried out.⁶⁷ Initially centred on the farm of Hougomont, which was defended by Wellington's troops against repeated French attacks, they have been extended to explore other areas of the battlefield, including the environs of the farm of Mont-Saint-Jean, which served as Wellington's field hospital, and the village of Placenoit, which was the scene of heavy fighting in the later part of the day, when Prussian troops arrived in support of Wellington and played a vital role in the defeat of Napoleon's army. A vari-

63. The authors of the article would like to thank the family of Franz Bünthe who, having read about our initial research in the *Frankfurter Allgemeine Zeitung*, reached out to us and provided us with the original documents.

64. Geheimes Staatsarchiv Preußischer Kulturbesitz, Geheimes Zivilkabinett, Denkmal zum Andenken an die in der Schlacht bei Belle-Alliance, HA Rep. 89 and Wiederherstellung des Denkmals bei Placenoit zum Andenken an die in der Schlacht bei Belle-Alliance gefallenen preußischen Soldaten, n. 18476.

65. The skeletons were found in the 1970s by a local but only brought to light by the authors of the current article. See: <https://edition.cnn.com/2023/01/25/europe/battle-waterloo-bones-scli-intl-scn/index.html> [consulted 30 May 2023].

66. TONY POLLARD, "These spots of excavation tell: using early visitor accounts to map the missing graves of Waterloo", in *Journal of Conflict Archaeology*, 16/2, 2021, 75-113.

67. Veteran's charity *Waterloo Uncovered* in cooperation with the *Walloon Heritage Agency (AWaP)*. See <https://waterloouncovered.com/>. [consulted 24 October 2022].

ety of techniques were deployed by the archaeological team, including geophysical survey, metal detecting and excavation.

Despite targeting areas noted in accounts of visitors to the battlefield in the days, weeks and months following the battle, not a single grave was encountered in and around the farm at Hougomont. These included the area outside the south gate, which on excavation proved to be devoid of burial evidence. Anomalies which might have suggested pyres were found on excavation to be the buried remains of the brick kilns used to create the building blocks for the farm itself, with charcoal in the bases and heated clay being the sources of the strong magnetic signals.

The same pattern emerged in the area that at the time of the battle was an orchard to the east of the garden and building complex at Hougomont. There were several eyewitness accounts of pits containing as many as 7,000 bodies in what is now an open arable field, but at the time of the battle was the scene of heavy fighting. Geophysical anomalies did indicate areas of interest but on excavation no trace of graves was uncovered. The absence of evidence for body disposal, both human and animal, was becoming something of a puzzle.

An investigation of the sandpit across the road from the farm of La Haie Sainte in 2018 also failed to uncover evidence for burial, though it should be noted that this work, consisting of two small trenches, was of limited extent. This is a location which is strongly associated with the burial of the dead, with Robert Hills, a British artist who visited the battlefield on 22 July 1815, just over a month after the battle, reporting it to contain “an enormous amount of slain”.⁶⁸ It also appears in a painting by artist James Rouse, who visited some weeks after the battle.⁶⁹

Things changed in 2019, when attention shifted to Mont-Saint-Jean, the farm behind the centre of Wellington’s line which served as a field hospital. Metal detector survey accompanied by excavation led to the discovery of three amputated human legs in ground adjacent to a lane behind the farm. One of these had a French musket ball embedded in it and the marks left by the saw gave visceral insight into the work of the surgeons. The same location was returned to in 2022, and with further excavation the skeletons of three horses and a complete human skeleton were encountered.

As the horse skulls contained musket balls it was clear that wounded animals had been walked into a long trench and there shot in the head, while amputated limbs and a human body were placed next to the horses. It is likely that more skeletal remains await discovery as neither end of the pit was exposed during the recent excavations.

Investigations were also carried out on land around Plancenoit, the village behind the French lines which was assaulted by Prussian troops. Metal detecting recovered French and Prussian musket balls, which provided proof for heavy fighting, but limited excavation focussed on geophysical anomalies has as yet to provide any evidence for body disposal.

The rare discovery of a burial pit, containing men and horses at Mont-Saint-Jean offers firm proof that evidence for body disposal at Waterloo has survived, thus demonstrating that the removal of human and animal bones for sugar processing did not destroy every grave. The rediscovery of ten skeletons by Bernard Wilkin and Robin Schäfer, two of the authors of the present article, in 2023 tend to confirm this hypothesis. They were first found by locals in early 1980 in the centre of Plancenoit and next to the Lion Mound.⁷⁰ Others will

68. ROBERT HILLS, 1816. *Sketches in Flanders and Holland; with some account of a tour through parts of those countries, shortly after the Battle of Waterloo; in a series of letters to a friend*. London. J. Haines and J. Turner, sold by J. Booth, R. Ackerman and W.H. Pyne.

69. It is perhaps useful here to recall the previously cited observations of Dr. Karl von Leonhard who visited around 1840 and reported open pits and piles of horse bones, presumably from the pits, near La Haie Sainte.

70. *Frankfurter Allgemeine Zeitung*, 24 January 2023. See: <https://www.faz.net/multimedia/schlacht-von-waterloo-forscherfinden-ueberreste-von-preussischen-soldaten-18622829.html> [consulted 31 January 2023].



Excavation of human skeleton underway at Mont-Saint-Jean (credit Vincent Rocher).



Horse skeleton excavated at Mont-Saint-Jean (credit Chris van Hout).



Horse's skull with musket ball wound (credit Véronique Moulaert, AWaP).

probably come to light as the archaeological work continues. Important here will be the currently ongoing geophysical survey of large tracts of the battlefield, which in conjunction with a detailed study of the contemporary accounts will allow for strategic targeting of promising locations.⁷¹ What can be said on the basis of present evidence is that any future discoveries are likely to represent only a fraction of the graves that were once present. Another issue to consider when it comes to survival is the nature of the crop itself. Sugar beet has roots which can extend more than two metres into the earth.⁷² Given the intensive nature of what in places appears to have been a monoculture, in places replacing wheat, and other grain crops, this characteristic, and the deep ploughing which preceded planting, might well have led to the disturbance of buried deposits including graves.

Work is currently underway to explore other areas of the battlefield using archaeological techniques, while a study is also being made to assess other battlefields in the light of remains thus far recovered. Recognising that sugar beet cultivation and Spodium production, had an impact on our understanding of archaeological survival at Waterloo, and other battlefields, requires us to refine our approach to these sites, influencing everything from methodologies to research questions and interpretations. Far from negating the need for further investigations, what can perhaps be described as a paradigm shift heralds an exciting new phase of archaeological endeavour.

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VIII. Conclusion

There is ample evidence that, during the first quarter of the 19th century, the bones of animals and horses buried on battlefields of the Napoleonic Wars were to some extent economically exploited all over Europe. Bone was an essential element of the fertiliser and sugar producing industry.

In Belgium, the rise of the sugar beet industry in the 1830s was the key moment in the transformation of the Waterloo battlefield. The bone trade became a lucrative business, a fact that was debated several times in Parliament. This essential resource was so valuable that illegal exportations and exploitations became common. In Braine-l'Alleud and Plance-noit, evidence suggests that local farmers dug the bones of the fallen either to provide the French industry or to sell to the local sugar and animal coal factories opened during the decade. Not only were the exhumations documented in official records, they were also reported by foreign travellers. Future archaeological findings might back up these discoveries. This article is only the beginning of a more substantial research on the fate of the battlefield casualties after the Napoleonic Wars. As we have hinted in the first three chapters, there is a global history of exploitation on an industrial scale hiding in plain sight. Waterloo was only the tip of the iceberg. The time has come in which historians and archaeologists should follow this line of investigation on other battlefields in Belgium and Europe.

71. TONY POLLARD, "These spots of excavation tell: using early visitor accounts to map the missing graves of Waterloo", in *Journal of Conflict Archaeology*, 16/2, 2021, 75-113.

72. PHILIPP DRAYCOTT, *Sugar Beet*, Oxford, 2006, 137.