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Space invaders: the legal status of meteorites in England and Wales

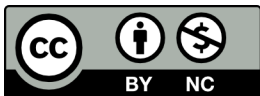
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Space Invaders: The legal status of meteorites in England and Wales

Summary

Considers the absence of law in England and Wales relating to ownership of a fallen meteorite. Discusses different possible approaches across the law relating to minerals, objects found, animals in a state of nature, treasure, Bona Vacantia and accretion. Advocates legislation in the area.

Introduction

The morning of 15 February 2013 began like any other in the Russian city of Chelyabinsk. Residents of the city woke up and prepared for their day, completely unaware that they were the target of a missile already travelling at c. 43,000 miles per hour, with an explosive energy equivalent to around 440,000 tons of TNT.¹

That missile was what became known as the Chelyabinsk meteor, a house-sized piece of rock from outer space which exploded in the atmosphere above Chelyabinsk at about 09:20 local time. Around 1,600 people were injured, mainly through glass breaking in the resulting shockwave,² and many eyewitnesses feared nuclear attack or even alien invasion.³ Yet within days, many of these same residents were out in the snow-covered fields surrounding the city, searching for pieces of the object that had nearly obliterated them.⁴

Meteorites have become big business. Most of the people searching the fields in the aftermath of the Chelyabinsk event did not strike lucky, although there were reports of some finds being sold for considerable sums in online auctions.⁵ But as with any precious material, the greater the quantity, the greater the value. Last year, Christie's auction house announced⁶ that a 13.5kg⁷ chunk of meteorite was available for private sale, with a valuation in the region of £2 million. Scots were offered a £10,000 bounty for finding chunks of a meteorite that (possibly) fell in 2016⁸ and with prices reaching \$1,000 a gram⁹ it is no wonder that the market for

¹ *Five Years after the Chelyabinsk Meteor: NASA Leads Efforts in Planetary Defense*, NASA (February 15, 2018), <https://www.nasa.gov/feature/five-years-after-the-chelyabinsk-meteor-nasa-leads-efforts-in-planetary-defense>.

² *Five Years after the Chelyabinsk Meteor: NASA Leads Efforts in Planetary Defense*, NASA (February 15, 2018), <https://www.nasa.gov/feature/five-years-after-the-chelyabinsk-meteor-nasa-leads-efforts-in-planetary-defense>.

³ *Russia meteor eyewitness: 'Something like the sun fell'*, BBC News (February 15, 2013) <https://www.bbc.co.uk/news/world-europe-21471942>.

⁴ Oxana Vozhdaeva and Oleg Boldyrev, *Chelyabinsk gripped by 'meteor fever'*, BBC News (February 25, 2013) <https://www.bbc.co.uk/news/world-europe-21554326>.

⁵ Leo Hickman, *Russian meteorite fragments fetch stratospheric prices*, The Guardian (February 18, 2013, 13:11 GMT) <https://www.theguardian.com/science/shortcuts/2013/feb/18/russian-meteorite-fragments-stratospheric-prices>

⁶ *Christie's To Offer One of the Largest Lunar Meteorites in Existence for Private Sales*, Christie's (April 30, 2020) <https://www.christies.com/about-us/press-archive/details?PressReleaseID=9198&lid=1>.

⁷ Roughly 2 stone, or the weight of two heavy bowling balls.

⁸ John Paul Breslin, *Meteorite hunter offers £10,000 reward for parts of space rock that fell on Scottish soil*, The Sunday Post (March 6, 2016, 12:01 am GMT) <https://www.sundaypost.com/news/scottish-news/meteorite-hunter-offers-10000-reward-for-parts-of-space-rock-that-fell-on-scottish-soil/>.

⁹ At the time of writing in January 2021, gold is currently worth £43 (€48) a gram.

meteorites is expanding.¹⁰ Like ambergris before them,¹¹ meteorites have the potential to visit incredible wealth on a lucky individual almost anywhere on earth.

In many parts of the world, specific law covers the legal rights to meteorite falls.¹² Yet in the United Kingdom, no such law exists. What if a meteorite were to land¹³ somewhere within the legal jurisdiction of England and Wales?¹⁴ What if that meteorite were found by someone other than the landowner? Or there were competing claims between tenant and freehold owner¹⁵? Does the state have any claim? English law has no problem recognising the relativity of title, but the hierarchy of title still must be established. If the hypothetical situation seems unlikely, it is worth noting that something very similar happened very recently elsewhere in the world, although reports¹⁶ that this made the Indonesian coffin-maker Josua Hutagalung an overnight millionaire appear to have been wide of the mark.¹⁷

The law relating to meteorites is by no means clear and considering the potential value of such a find, it is important that greater clarity is established. Clarifying the legal position may potentially have wider effects than avoiding a potential dispute in a single case. If it can be demonstrated that the state will take the “reward” that a meteorite offers, then surely this provides a further reason to argue for increasing the resources dedicated to tracking and predicting potential strikes; while a legal right to a reward for finders could potentially stimulate further development of private networks. The Chelyabinsk meteor exploded high enough above Earth that the damage was relatively light, considering that the explosion was around 30-40 times stronger than the atomic bomb dropped on Hiroshima.¹⁸ It is a threat that NASA, among others, has warned must be taken seriously.¹⁹ This article will consider six different lenses through which the law could examine a hypothetical meteor fall before concluding that legislation would be the most preferable solution, along similar lines to the Treasure Act 1996.

¹⁰ Jim Clash, *These Sculptures Were Made in Space (and Their Prices are Astronomical)*, Robb Report (July 23, 2018) <https://robbreport.com/shelter/art-collectibles/market-meteorites-on-rise-eg18-2807263/>.

¹¹ On which see the fascinating Christopher Kemp, *Floating Gold: A Natural (and Unnatural) History of Ambergris* (University of Chicago Press, 2012).

¹² Max Gounelle and Matthieu Gounelle, *Meteorites: International law and regulations*, 54 *Meteoritics & Planetary Science* 2887, 2899 (2019).

¹³ This article will not consider in detail the position of where a meteorite that fell at some undetermined point before the immediate past is only now discovered.

¹⁴ The other nations that make up the United Kingdom, Scotland and Northern Ireland, have different legal systems although the author would argue that statutory provisions could and should apply across the UK.

¹⁵ Which gave rise to a legal dispute about a meteorite that landed in Virginia in the United States, attracting the interest of the local law school among others. Amy Dodson, ‘*Who owns this meteorite?*’, William and Mary (September 28, 2011) <https://www.wm.edu/research/news/social-sciences/who-owns-this-meteorite5698.php>.

¹⁶ Adam Forrest, *MAN BECOMES MILLIONAIRE AFTER METEORITE FALLS THROUGH HIS ROOF*, The Independent (November 18, 2020, 15:49 GMT) <https://www.independent.co.uk/travel/asia/millionaire-meteorite-crashes-indonesia-house-b1724999.html>.

¹⁷ Andreas Illmer, *The Indonesian meteorite which didn't sell for \$1.8m*, BBC News (November 22, 2020) <https://www.bbc.co.uk/news/world-asia-55013725>.

¹⁸ Elizabeth Howell, *Chelyabinsk Meteor: A Wake-Up Call for Earth*, space.com (January 9, 2019) <https://www.space.com/33623-chelyabinsk-meteor-wake-up-call-for-earth.html>.

¹⁹ Chloe Taylor, *Threat to earth posed by meteors must be taken seriously, NASA warns*, CNBC (April 30, 2019, 9:18am EDT) <https://www.cnbc.com/2019/04/30/threat-to-earth-posed-by-meteors-must-be-taken-seriously-nasa-warns.html>.

Terminology

Astronomers usually draw a distinction between “meteoroids” (and “asteroids”), which are objects in space; “meteors”, which are objects that have come from space and entered Earth’s atmosphere²⁰; and “meteorites”, which refers to whatever physical remains of a meteor reach the Earth’s surface.²¹ For the sake of clarity, in this article the term “meteorite” will be defined as “a solid object of extra-terrestrial origin that landed on the ground of Earth or another celestial body due to natural forces”.²²

The following discussion will make reference to both natural and man-made objects. For clarity, where only one of these types of object is meant this will be made explicit. Where both types of object are included, the word “things” is used.

(1) As a type of mineral

Meteorites may be made up of a combination of nickel-iron and silicate, in varied proportions.²³ Iron meteorites are rare, making up roughly 4-5% of observed falls,²⁴ however even so-called “stony meteorites” will usually contain metals. Most such meteorites are “chondrites” which means that they contain small spheroid chondrules, material formed at the same time as our solar system. The remainder, “achondrite” meteorites, lack these chondrules but are mainly made up of the minerals plagioclase, pyroxene and olivine.²⁵ Far more could be said on how meteorites are constituted and how they should be classified, but it can safely be said that the vast majority of observed meteorites contain metals and/or minerals in at least some proportion; and even the rock which meteorites often consist of is in a physical sense different to what could be considered the ‘stuff’ of which our own planet is made.

For this reason, meteorites might appear to fit neatly into an existing classification of “land” – “mines and minerals, whether or not held apart from the surface...” as the Law of Property Act 1925 definition runs.²⁶ A meteorite is made up of what many scientists would consider “minerals”; and is created “naturally” in the sense that no human agency or labour is required for its creation. A meteorite is thus a natural object in much the same way as any other lump of stone or iron that might be found on or in the ground.

There are, however, two principal objections to classifying meteorites as part of what can generally be termed “minerals” – one definitional and one more substantial. The former is easily illustrated by considering example definitions. Jowitt’s Dictionary talks of “Naturally-occurring substances of commercial value which can be got from the earth”.²⁷ The Land Registration Act 2002 defines “mines and minerals” as including “any strata or seam of

²⁰ These objects will be travelling at extremely high velocities and will be “burning up” as they descend, leading to their (misleading) common name of “shooting stars”.

²¹ *Meteors & Meteorites*, NASA https://solarsystem.nasa.gov/asteroids-comets-and-meteors/meteors-and-meteorites/overview/?page=0&per_page=40&order=id+asc&search=&condition_1=meteor_shower%3Abody_type.

²² Alan E. Rubin and Jeffrey N. Grossman, *Meteorite and meteoroid: New comprehensive definitions* 45 *Meteoritics & Planetary Science* 114-122 (2010).

²³ *A Dictionary of Astronomy* “meteorite” (Ian Ridpath ed., Oxford University Press 3 ed. 2018).

²⁴ *A Dictionary of Astronomy*, “iron meteorite”.

²⁵ *A Dictionary of Astronomy*, “achondrite”.

²⁶ Section 205(1)(ix) Law of Property Act 1925.

²⁷ *Jowitt's Dictionary Of English Law* “minerals” (Daniel Greenberg ed., Sweet and Maxwell 2015).

minerals or substances in or under any land”.²⁸ Turning to common law, *Kindersley V.-C.* was careful to confine his remarks only to the immediate case but used a definition in *Darvill v Roper*²⁹ of “such substances as are dug out of the earth by means of a mine”. More recently in *Star Energy v Bocardo SA*,³⁰ the most recent Supreme Court authority relating to mineral wealth, Lord Hope referred to “the owner of the strata beneath [the surface], including the minerals that are to be found there”. These definitions would likely not encompass a recently landed meteorite, focusing as they do on what comes out of the Earth.

Yet the English law has never found it hard to stretch the meaning of a word and given there is Court of Appeal authority that black can be white,³¹ there is certainly authority which could justify a view of meteorites as a form of mineral. Lord Romilly M.R. bluntly declared “Stone is, in my opinion, clearly a mineral; and in fact everything except the mere surface, which is used for agricultural purposes...”,³² while the House of Lords held in *North British Railway Co v Budhill Coal & Sandstone Co*³³ that there was no single prescribed meaning which could be given to the word “minerals”. After an extremely comprehensive review of the authorities up to 1982,³⁴ Slade J came to a similar conclusion although offered some support for a test which asked whether a substance was “exceptional in use, in value and in character”.³⁵ An object that is literally from out of this world would surely meet that test.³⁶

However, even if a meteorite or its constituent elements can be brought within a definition of “minerals” such a classification would ignore the basic presumption made in all of the above law. Any concept of Crown ownership of valuable resources found in the land (or indeed the more general notion of Crown ownership of the land itself) is founded on the premise that the land of England is (or at least was) within the royal prerogative³⁷ and therefore the valuable minerals in question are to be defined as part of that land.³⁸ Similarly, given that freehold title derives from the Crown, private ownership of land is also based on the same underlying assumption. However, where a hypothetical meteorite falls from the sky, clearly that meteorite was not part of the land yesterday; or when the land was last conveyanced. Had the bright light in the sky in April 1066 that the Normans took as a portent of the success of William’s imminent invasion of England³⁹ been a meteor rather than Halley’s Comet, then the land William conquered would have included that meteorite. Given that English law

²⁸ Section 132(1).

²⁹ (1855) 3 Drew. 294.

³⁰ [2010] UKSC 35 [2011] 1 A.C. 380 at 399.

³¹ *Mitchell v Henry* (1880) 15 Ch.D. 181 where it was held that the Master of the Rolls had been wrong to hold that “black selvage” was not “white selvage”.

³² *Midland Railway Co v Checkley* (1867) L.R. 4 Eq. 19 at 25.

³³ [1910] A.C. 116.

³⁴ *Earl of Lonsdale v Attorney-General and Another* [1982] 1 W.L.R. 887.

³⁵ A test which has been used in recent decisions, see e.g. *Wynne-Finch v Natural Resources Body for Wales* [2020] EWHC 1924 (Ch).

³⁶ If such a classification held, the owner of the land would appear to have a proprietary right in the meteorite and the Crown may have no claim, at least *post facto*. See *Attorney General v Morgan* [1891] 1 Ch. 432 *per* North J at first instance: “The law with respect to the right of the Crown in mines does not present any serious difficulty. It seems probable that at one time the right to all mines, even in the land of a subject, was vested in the Crown, but that in the course of years the right to get all baser mines in his lands was conceded to the subject who owned such lands, except in certain portions of the kingdom with which we are not now concerned. In this concession, however, no Royal mines, or mines of gold and silver, were included, and such mines have from the first always been, and still are, the exclusive property of the Crown as part of the Royal prerogative.”

³⁷ As unanimously agreed in *The Case of Mines* (1568) 1 Plowden 310.

³⁸ The same reasoning applied to the doctrine of treasure trove, as discussed below.

³⁹ Richard Proctor, *Comets as Portents*, 32(126) *Belgravia*: a London magazine 195, 204 (1877).

considers “time immemorial” to mean since 1189⁴⁰ there is no question that resources operating on geological timescales such as coal or oil were already in the ground at that point.

There is therefore a distinct and crucial difference between minerals and things which have come onto the land more recently. In *Parker v British Airways Board*⁴¹ the court was asked to decide who had the best right to a gold bracelet found in an airport lounge. The case was between the airline operating the lounge and the member of the public who found the bracelet. The Crown made no claim on the bracelet, despite legal precedent stating that all gold found *within* land belongs to the Crown.⁴² Nor should it have. The material out of which the bracelet was made was, in this sense, irrelevant. There is a distinct and insurmountable difference between things which have existed in one form or another as part of “the Earth” for at least some period of time; and a new thing which comes onto the land from elsewhere. Such things may indeed become part of the realty⁴³ over time or through the actions of the landowner. Bricks brought onto land and mortared into a permanent building will be owned by the owner of the land as a whole; but if a truck carrying bricks accidentally sheds its load in a landowner’s garden those bricks do not suddenly and immediately become the property of the landowner.

(2) As an object found

If a meteorite can, in one sense, be compared to a lost chattel such as the gold bracelet in *Parker*, then the argument follows that the same legal considerations should be applied. The law distinguishes between objects found in the land and objects found on the land. Objects in the land are considered to be part of it and this general principle has guided court decisions that the owner of land is the owner of a fallen meteorite in Canada,⁴⁴ the United States⁴⁵ and France.⁴⁶ However, in the latter jurisdiction more recent authority has seen a meteorite instead categorized as being ownerless and subsequently becoming the property of the finder.⁴⁷ This may well be the best way for the law to view meteorites that have fallen at some distant point in the past and become buried in the ground. It is suggested that in that situation the meteorite would almost certainly be part of the estate and the only question of ownership would arise if the land is subject to a leasehold estate (by analogy see *Elwes v Brigg Gas Co.*).⁴⁸

Yet while in practice the impact of a meteorite may drive some of it into the ground, there is little justification for treating a recently fallen object as analogous to, for example, the prehistoric boat that was the object in question in *Elwes v Brigg Gas Company*. Chitty J clearly relied in his judgment in that case on the fact that “the boat was embedded in the land; a mere trespasser could not have taken possession of it, he could only have come at it by

⁴⁰ Statute of Westminster, The First (3 Edw. I cap. 39)

⁴¹ [1982] Q.B. 1004.

⁴² *The Case of Mines* (1568) 1 Plowden 310.

⁴³ See for example the law relating to fixtures and fittings.

⁴⁴ *MacCrimmon et al. v Smith et al.*, 12 B.C.R. 377, at 384 (1906). This decision and the two following decisions are described as reported in Douglas Schmitt, *The law of ownership and control of meteorites*, 37 *Meteoritics & Planetary Science* B5 (2002).

⁴⁵ *Goddard v Winchell* (86 Iowa, 71; 52 N.W. 1124; 17 L.R.A. 788; 41 Am. St. Rep. 481).

⁴⁶ *Toche c. Descordes et Lejean* (DT 98, 2, 507, Tribunal civil d'Aix, 1898 January 17 (M. Schoell, Pr.)).

⁴⁷ Max Gounelle and Matthieu Gounelle, *Meteorites: International law and regulations*, 54 *Meteoritics & Planetary Science* 2887, 2899 (2019).

⁴⁸ (1886) 33 Ch.D. 562

further acts of trespass.”⁴⁹ The boat had been part of the land when the plaintiff inherited it; therefore it remained part of the land at the time it was found. However, *Elwes* does provide a solid foundation for the argument that where the finder of the meteorite is not entitled to be there at all, any right to the property will be “very limited”⁵⁰ and certainly less than that of the owner of the land. As with those using metal detectors to find treasure, meteorite hunters would be well advised to always ensure they have the landowner’s permission for their search.

Would it be better to consider a meteorite as an object upon, rather than attached to, the land? While not man-made, a meteorite shares some characteristics of a lost chattel. It is an inanimate object, with a financial value but no ascertainable “true owner”; and most importantly it has only recently come onto the land. If considered as a chattel, the test for whether the finder or the landowner has a better claim to the meteorite is whether the landowner has manifested an intention to exercise control over the land in question. This is where this approach becomes problematic. In *Parker* the Court of Appeal made it clear that “control” is not to be assessed as a general restriction on which categories of persons can enter the land; there must be a “manifest intention to assert custody and control over lost articles”. It would be stretching this test past its breaking point to ask whether a landowner had a manifest intention to control any matter from outer space that may land on his or her property. Indeed, the tiny minority of the general population who have a particular interest in the study of meteorites would, one imagines, be aware of the infinitesimally low odds of such an event occurring and thus even they would not give their minds to exercising such control.

(3) As something from nature

One class of things which the law has long recognized are incapable of “control” in the same manner as a lost chattel are *feræ naturæ* or wild animals. Since at least the 16th century such animals have been held to be incapable of absolute ownership,⁵¹ at least while alive.⁵² The recent Court of Appeal decision in *Borwick Development Solutions Ltd v Clear Water Fisheries Ltd*⁵³ provides a useful summary of the relevant history,⁵⁴ tracing the doctrine’s origins to Roman law. Only qualified title can exist in wild animals and that only in three instances: (1) a young animal born on the land; (2) property in the remains of an animal when killed; and (3) where an animal is brought into possession through injury or effort.⁵⁵ Clearly none of these categories neatly encompasses a large ball of ancient rock or iron; however the analogy is not entirely without merit.

⁴⁹ The judgment also considered the argument that the boat was itself a mineral, but *obiter* Chitty J did not agree. See 566 “I am not aware that the term “minerals” has ever been held to include anything except that which is part of the natural soil. Unquestionably coal is deemed in law a part of the natural soil, without regard to what geologists may shew to have been its origin. In law the natural processes by which the trees of a forest have become coal are not investigated: the result only is considered. But the boat has not become petrified or fossilized; it always has been distinguishable from the natural soil itself. If, therefore, I were required to decide the question, I should hold that it is not a mineral.”

⁵⁰ *Per* Donaldson LJ in *Parker* at 1017.

⁵¹ *Case of Swans* (1572) 7 Co. Rep. 15b.

⁵² For a much wider consideration of the origins of the principle, see Steven M. Wise, *The Legal Thinghood of Nonhuman Animals*, 23 B.C. Env’tl. Aff. L. Rev. 471 (1996).

⁵³ [2020] EWCA Civ 578; [2020] 3 W.L.R. 755.

⁵⁴ See especially the judgment of Sir Timothy Lloyd.

⁵⁵ In the Latin, (1) *ratione impotentiae et loci*; (2) *ratione soli* and *ratione privilegii*; and (3) *per industriam*.

The law sees a wild animal while in a “state of nature” as not capable of being owned.⁵⁶ This is a strange concept for English property lawyers, although their Scots and mainland European counterparts are more familiar with it. *Res nullius* as a category in the Roman legal system has been said to have included *inter alia* abandoned property, precious stones and hidden treasure⁵⁷ as well as wild animals. While it is impossible to know for sure the reasoning behind a rule that dates back at least two millennia, two potential justifications come to mind. Either wild animals are treated differently to domesticated animals because they cannot be controlled and thus could move from one piece of land to another; or they are considered ownerless because they are entirely natural – no human agency is involved in their creation or maintenance.⁵⁸ Both statements apply equally to meteorites (while unable to move once landed, a meteorite clearly passes across many different plots of land as it travels through the atmosphere, at least once it enters the “lower strata”).⁵⁹

What would be the effect of considering a meteorite as equivalent in law to an animal *feræ naturæ*? Clearly the categories of beginning or ending life on the land could not be applied. The question would then be whether the landowner or finder had taken steps to bring the meteorite into his or her possession (*per industriam*). This could be relatively easily judged. For example, the landowner or finder may physically take a small meteorite into possession, or chip a small piece off a larger whole for verification by an expert. The test here is based on control over the object once found, rather than the pre-emptive control of *Parker* that was discussed in the previous section.

However, such an interpretation will only be of assistance if the landowner or finder has taken the meteorite into possession; it does not resolve the conflict if neither has done so. It also does not consider any potential claim of the Crown.

(4) As treasure

As already observed, the Crown or, in practical terms, Parliament has claimed a number of valuable resources such as gold, oil and natural gas. However, the law relating to treasure was, until 1996, a creation of the common law and the doctrine of treasure trove. Whether a meteorite could be treasure trove is no longer a question that requires an answer⁶⁰ although it has been suggested that the lack of an original owner would mean it was not.⁶¹

The Treasure Act 1996 now regulates the area and section 1 defines “treasure” in some detail. However, s1(2) clearly excludes both “unworked natural objects” and minerals from a “natural deposit” from the ambit of the Act. Almost certainly one, if not both, of these definitions would apply to a meteorite and therefore the Act in its current form has no application. Of course, where a meteorite was then worked into a man-made object (as was

⁵⁶ See *Sutton v Moody* (1697) 1 Lord Raymond 250, cited with approval by the House of Lords in *Blades v Higgs* 11 HL Cas 621.

⁵⁷ Steven M. Wise, *The Legal Thinghood of Nonhuman Animals*, 23 B.C. Env'tl. Aff. L. Rev. 471 (1996).

⁵⁸ In substance this argument is the same as that advanced by Blackstone, that all things are “from the immediate gift of the Creator” (as quoted by Steven M. Wise, *The Legal Thinghood of Nonhuman Animals*, 23 B.C. Env'tl. Aff. L. Rev. 471 (1996)).

⁵⁹ See e.g. *Lord Bernstein v Skyviews and General Ltd* [1978] Q.B. 479.

⁶⁰ As the doctrine is abolished by S4(3) Treasure Act 1996.

⁶¹ Douglas Schmitt, *The law of ownership and control of meteorites*, 37 *Meteoritics & Planetary Science* B5 (2002).

common, especially before iron could be worked)⁶² that object might then be covered by the Act. It should be noted that section 2 of the Act does give the Secretary of State the power to designate a class of object as treasure by order, although this would require Parliamentary approval and for the class to be considered of “outstanding historical, archaeological or cultural importance”.

In the UK our instinct is to classify meteorites as having scientific rather than cultural value, but some cultures have certainly valued meteorites as ceremonial or religious objects. One such meteorite, the Willamette Meteorite or *Tomanowos*⁶³ was twice the subject of litigation in the United States as the Confederated Tribes of the Grand Ronde Community of Oregon sought to recover it from the American Museum of Natural History. The case was settled before the court could rule on the matter.⁶⁴ Many jurisdictions consider meteorites as cultural property under wider legislation, such as the classification of meteorites under New Zealand’s Antiquities Act 1975. Indeed, a survey of more than 20 countries’ legal approach to meteorites found that meteorite finds were at least partially regulated by legislation in Argentina, Australia, Canada, Denmark, India and Switzerland amongst others.⁶⁵ In China, the state laid claim to a large meteorite despite the protests of the landowner.⁶⁶ Meteorites are also cultural property in the international context. A UNESCO Working Group on Meteorites operated in the 1960s and it has been suggested, for example, that meteorites are covered by the UNESCO Cultural Property Convention 1970.⁶⁷

There has been at least one attempt to bring meteorites falling on the United Kingdom under statutory control, when in 1971 a Meteorites Bill reached the stage of a second reading in the House of Lords but was taken no further. Introducing the Bill, the Earl of Cranbrook highlighted much of what has been said in the introduction to this article: that while rare, meteorite strikes were by no means unknown (indeed Lord Balerno went on to give a detailed account of the confusion caused by a fall in Scotland in 1917) and from reported falls meteorites could be expected to land in the UK at, very roughly, ten year intervals; that such falls had great scientific value; and a further argument that due to the short radioactive half-life of some of the elements found in meteorites, “the sooner they are in the hands of the scientists and in a properly equipped laboratory the better”.⁶⁸

The Earl referred to UNESCO’s work in the area and highlighted the absence of law on the topic in the United Kingdom. The Bill proposed was extremely short and essentially provided that meteorite falls after the law came into force would be Crown property (in practice meaning that most of the fall would go to relevant museums); with some form of “appropriate reward” to the finder. The Earl went on to explain that no liability would attach until the

⁶² Albert Jambon, *Bronze Age iron: Meteoritic or not? A chemical strategy*, 88 *Journal of Archaeological Science* 47 (2017).

⁶³ Sam Markowitz *A Meteorite and a Lost City: Mutually Beneficial Solutions through Alternative Dispute Resolution*, 14 *Cardozo Journal of Conflict Resolution* 219 (2010).

⁶⁴ John Sullivan, *Pact Leaves Meteorite With Museum*, *New York Times* (June 23, 2000)

<https://archive.nytimes.com/www.nytimes.com/library/national/science/062300sci-meteor-pact.html> and more recently Erin Ross, *Willamette Meteorite returned to Oregon tribe*, *The Columbian* (February 23, 2019, 8:11pm PST) <https://www.columbian.com/news/2019/feb/23/storied-rock-is-the-largest-found-in-north-america/>.

⁶⁵ Douglas Schmitt, *The law of ownership and control of meteorites*, 37 *Meteoritics & Planetary Science* B5 (2002).

⁶⁶ Karoline Kan and Mike Ives, *Meteorite Finder Fights China’s (Mostly Terrestrial) Property Law*, *New York Times* (April 8, 2017) <https://www.nytimes.com/2017/04/08/world/asia/china-meteorite-property-law.html>.

⁶⁷ Max Gounelle and Matthieu Gounelle, *Meteorites: International law and regulations*, 54 *Meteoritics & Planetary Science* 2887, 2899 (2019).

⁶⁸ HL Deb 30 March 1971 vol 316 cols 1231-47.

meteorite landed. “If it passed through the house of one of your Lordships; or indeed through the head of one of your Lordships, that would be just too bad.”

Unfortunately, the Lord Chancellor (Lord Hailsham) was extremely doubtful, both about whether Parliamentary business would allow time for the Bill to be debated and passed, and about the actual provisions of the Bill itself. Referring to the lack of machinery in the Bill for enforcement, Lord Hailsham worried that finders would have no financial incentive to report their finds. He also wondered whether it was right that no compensation would be due to a landowner whose property was damaged by the fall. Hansard records no further reference to the Bill after this debate.

(5) As Bona Vacantia

In the absence of legislation, the state in the form of the Crown may still have a claim under the concept of Bona Vacantia. While usually considered in the context of intestacy, this is a wider category that could potentially be considered to extend to all ownerless property.⁶⁹ As Romer LJ posited in *Re Sir Thomas Spencer Wells, Swinburne Hanham v Howard*,⁷⁰ “[T]he rule at common law is that property must belong to somebody, and where there is no other owner...it is the property of the Crown.”⁷¹

As noted above, the Crown did not deign to put forward any claim on the lost bracelet found at Heathrow – but could such a claim be made were a large meteorite fall worth millions of pounds be discovered? The answer would depend on where the rather nebulous limits of Bona Vacantia are to be drawn. The doctrine in its usual sense, the assets of a person who dies, is governed by the Administration of Estates Act 1925 and it could be argued that the statute, by omission, limits the doctrine to that situation. *Re Mitchell* [1954] Ch. 525 is authority that the statute is separate to, rather than a replacement of, any prerogative right however. Furthermore, the original doctrine of treasure trove was considered part of Bona Vacantia although the authors of the Law of Personal Property express a preference for the view that the doctrine only applies to “established categories”.⁷²

Yet, admittedly in very different circumstances, where money seized by the police could not be shown to the proceeds of crime and the original possessor of the money sued for its recovery, the court was unwilling to “countenance expropriation by a public authority of money or property belonging to an individual for which there is no statutory authority”. As May LJ went on to say, “If statutory provision for civil confiscation are inadequate, it is for Parliament to strengthen them after proper consideration of all the implications”. The Court of Appeal was not persuaded by public policy arguments and the same principles could be applied to a meteorite – that the state cannot choose after the fact to claim what it could have legislated for. Weight is provided to that hypothetical approach by the existence of statutes such as the Petroleum Act 1934 and the already discussed Treasure Act 1996, both examples of Parliament expressly laying claim to things of value.

⁶⁹ See discussion in *The Law of Personal Property* 16-006 (Michael Bridge et al. eds., Sweet & Maxwell 2^d Ed 2017).

⁷⁰ [1933] Ch 29.

⁷¹ Authority for that proposition can be found in the judgments in that case, dating back to the 18th century in cases such as *Middleton v Spicer* (1783) 1 Bro. C. C. 201, 202. “The King is the owner of every thing which has no other owner.”

⁷² *The Law of Personal Property* 16-006 (Michael Bridge et al. eds., Sweet & Maxwell 2^d Ed 2017).

(6) As accretion

One final doctrine that is worthy of note is that of accretion, where “new” land becomes the property of the landowner. Accretion has been judicially described as “a doctrine which gives recognition to the fact that where land is bounded by water, the forces of nature are likely to cause changes in the boundary between the land and the water.”⁷³

To the extent that accretion applies to change in land due to the forces of nature, there is much to recommend the doctrine as a simple and straightforward answer to the problem of meteorite ownership. Unquestionably, were the doctrine to apply, ownership would vest in the owner of the land. There is a certain logic in a doctrine which recognizes that land will naturally change over time as the result of vast forces outside of the control of individual landowners being applied in such a situation. A further advantage would be that the doctrine has already been legally developed and there would be no need to create new principles of law.

However, even leaving aside the fact that accretion has always been applied to the actions of water alone, subsequent authority has also made clear that accretion involves “gradual and imperceptible” changes to the land, as was recently confirmed by the Supreme Court in *Loose v Lynn Shellfish Ltd.*⁷⁴ This would preclude application of the doctrine to the sudden and extremely perceptible impact of a meteor.

A note on space law

While the above discussion has focused on the domestic law of England and Wales, the Outer Space Treaty 1967 is worthy of mention. The Treaty explicitly prevents States from appropriating celestial bodies in Article II. ‘Outer space’ is not defined in the Treaty and it seems difficult to encompass the surface of the Earth in any reasonable definition of the concept, especially given that there must logically be a point at which the law of the air replaces space law⁷⁵. Similarly, the debate as to the rights of individual states (or private actors) to mine asteroids in outer space should be distinguished from the current question as to ownership once the meteorite has impacted the Earth.

Conclusion

Through examination of six different legal principles, it is clear that arguments can be made on the current law that a freehold owner, a tenant, a finder and the Crown all may have at least some relative title to a fallen meteorite. Given the economic and scientific value of such a fall, it would seem preferable that some form of certainty was provided, as has been the case in many other jurisdictions.

It is easy to say why any of the parties identified should have such a right to a meteorite fall. Most immediately, the actual finder of the meteorite may well have invested considerable

⁷³ *Per* Lord Wilberforce in *Southern Centre of Theosophy Inc v State of South Australia* [1982] AC 706 at 716.

⁷⁴ [2016] UKSC 14 [2017] A.C. 599.

⁷⁵ There is a long-running debate between ‘spatial’ and ‘functional’ approaches, but both would draw any boundary well above the surface of the Earth. For further discussion, see e.g. Katherine M. Gorove, *Delimitation of Outerspace and the Aerospace Object - Where is the Law*, 28 *Journal of Space Law* 11 (2001).

time and effort in tracking the meteorite, either during its fall and/or in locating any recoverable fragments. However, if the meteorite now lies in the smouldering ruins of a house or business, then it is easy to see why the landowner and/or tenant could also be considered to have a strong claim to the possible financial rewards of ownership. As to the public interest, there is both the economic argument that potential state (or private) profit from locating meteorites might support or even directly fund better meteorite detection systems⁷⁶; or the wider argument that the scientific benefits of such material means that it is a form of *res communis*.

Conversely, it is much more difficult to say that any of these parties should be deprived of their rights. Along with losing the benefits already identified, there are specific reasons why what could well be a rather arbitrary decision against any of these parties could have a more severe impact. There was much discussion both before and after the passage of the Treasure Act 1996 as to the danger that if a regime does not compensate finders, there is a strong economic disincentive to report finds.⁷⁷ A landowner with no financial reward to pay for meteor damage would potentially need to rely on the vagaries of any relevant insurance policy and this is by no means guaranteed.⁷⁸ Were the state not to have any legal claim it could possibly be argued that wider prerogative rights would be weakened; and in more immediate terms the nation would be the poorer both financially and scientifically.

Clarity can best be provided by specific and clear legislation, most likely in similar terms to the Treasure Act 1996 which has proven effective in almost 25 years of operation. That Act was passed after the advance of technology (in that case relatively cheap and simple to use metal detectors becoming available to the public at large) and as Fincham has persuasively argued⁷⁹ the combination of a legal framework and a voluntary program has been extremely effective. The Act is straightforward in both letter and spirit. It defines “treasure” (sections 1-3), it establishes ownership (sections 4-6), establishes the procedure when potential treasure is found (sections 7-9A), and then provides rewards for finders and/or occupiers of land where treasure is found (section 10).

Today, the advance of technology (especially cheap, internet-enabled cameras⁸⁰) makes tracking meteor falls increasingly viable and a similar approach is difficult to argue against. An effective Meteorites Act would in turn need to provide: a legal definition of a meteorite; certainty as to who owns a meteorite (and at what point ownership is conferred); some form of notification procedure and a duty to notify (potentially backed up with sanctions in a similar way to the Treasure Act 1996); and detail as to how the “proceeds” of the fall would be divided. An Act drafted in very similar terms to the 1996 legislation would mean Crown ownership but could provide for compensation or reward for finders and/or those with estates in the land where the meteorite fell; but equally the legislation could grant ownership to one of these parties with a provision that, for example, a certain weight or percentage of the

⁷⁶ Mike Wall, *About 17,000 Big Near-Earth Asteroids Remain Undetected: How NASA Could Spot Them*, space.com (April 10, 2018) <https://www.space.com/40239-near-earth-asteroid-detection-space-telescope.html>.

⁷⁷ See for comment Judith Bray, *The law on treasure from a land lawyer's perspective*, 4 Conv. 265 (2013).

⁷⁸ On the wider issues entailed see Paul Kovacs and Andrew Hallak, *Insurance Coverage of Meteorite, Asteroid and Comet Impacts — Issues and Options*, in *Comet/Asteroid Impacts and Human Society* Peter Bobrowsky and Hans Rickman eds., Springer 2007).

⁷⁹ Derek Fincham, *A coordinated legal and policy approach to undiscovered antiquities: adapting the cultural heritage policy of England and Wales to other nations of origin* 15(3) *International Journal of Cultural Property* 347 (2008).

⁸⁰ For an example in use in the UK see the UK Fireball Network as explained at Paul Cockburn, *UK Fireball Network: helping track British meteorites*, BBC Sky at Night Magazine (July 24, 2019, 12:15pm GMT) <https://www.skyatnightmagazine.com/space-science/uk-fireball-network-track-british-meteorites/>.

material recovered was made available to researchers. As with the tracking of the multitude of objects that fly past (and occasionally into) the Earth every year, there is much to be said for planning ahead.

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