

# The First Experiments on Platinum

## CHARLES WOOD'S SAMPLES FROM SPANISH AMERICA

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The distinction of being the first man to bring samples of platinum to Europe and to carry out a few preliminary experiments on its nature and properties belongs to Charles Wood, a son of the famous William Wood, an ironmaster and the producer of the copper coinage known everafter as Wood's Halfpence.

How this important step came to be taken, and how it led to the first scientific examination of platinum and its identification as a new element involves a most curious chapter in the history of metallurgy and links two quite separate activities taking place some thousands of miles apart, the Spanish conquerors of South America and their thirst for gold with the introduction in England of the smelting of iron ore with coal or coke instead of charcoal.

The story of the Conquistadore's intensive search for gold and their insensitive melting down of huge quantities of gold objects in the sixteenth century is well known, but their penetration into the inhospitable region of the Choco, the long narrow strip of country between the main Cordillera of the Andes and the Pacific Ocean in what is now Colombia, did not occur for very many years. When finally, in about 1690, the extraction of gold from the river beds in this area began to be organised it was found that, mixed with the gold, was another whitish metal that was given the name of Platina, a derogatory diminutive of plata, their word for silver. This was considered to be worthless and was used by unscrupulous miners to adulterate the gold to such an extent that in



**Charles Wood  
1702-1774**

Born in Wolverhampton, the sixth son of the famous William Wood, ironmaster and the producer of the copper coinage known as Wood's Halfpence, Charles moved to Jamaica in 1736 after the failure of a scheme promoted by his father for smelting iron with coal in Cumberland. Here for some years he superintended a lead mine and on his return to England he brought with him the first specimens of native platinum to reach Europe and to be submitted to scientific examination

Photograph from a portrait in the possession of the family by courtesy of Miss Margaret Wood

1707 a governmental decree was issued prohibiting this practice. None the less small amounts were put to use and there is a record of a gift made in about 1730 to the Viceroy of New Granada of a rapier guard and a set of buckles (1). Much of this new metal however, was shipped illegally down river to Cartagena and thence to Jamaica and it is here that Charles Wood comes into the story.

### **William Wood, the "Irish Patentee"**

To explain the career of Charles Wood we have first to give some account of the activities of his father William Wood (1671–1730). Born in Wolverhampton, he progressed to become the owner of a number of copper and iron mines in the west of England as well as rolling mills and forges. In 1722, with the support of the Prime Minister Robert Walpole and through the influence of the German mistress of George I, the Countess von Schulenberg (created Duchess of Kendal in 1719) he obtained a patent for the production of copper coinage for Ireland in return for a payment to her of £10,000. The coins, halfpence and farthings, were struck in two locations, at Seven Dials in London and at Bristol, and assays carried out by Sir Isaac Newton, at that time Master of the Mint, showed that the copper "was of the same goodness and value with that which was coined for England" (2). Wood also secured a patent to produce coins for the North American colonies, these being in brass described in a contemporary journal as "a beautiful compound metal" (3).

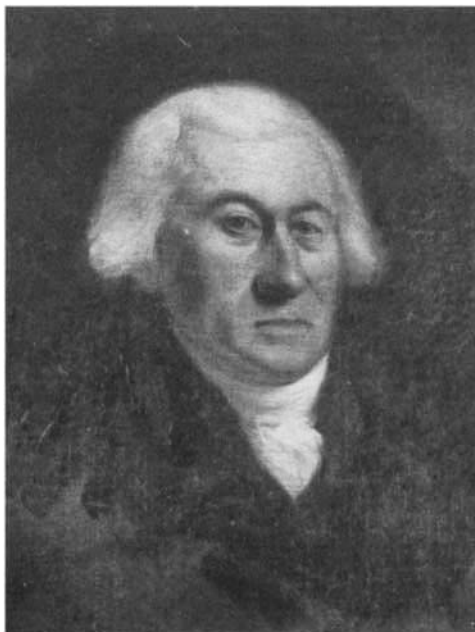
Although there was a great deal of complaint from Ireland about the introduction of coinage from England—including the famous Drapier letters of Dean Swift who quite unjustifiably "set down gossip as gospel with figments of his own" (4)—there is no doubt that Wood, known afterwards as the Irish Patentee, was a thoroughly honest citizen as well as a man of considerable energy and enterprise. Unfortunately for almost a hundred and fifty years he has been confused in the literature with a quite different William Wood and thus

often labelled as a rogue. This other William in 1720 became the manager of a company called the Mines Royall of Jamaica, formed to operate the (non-existent) gold and silver mines in that island. This was of course a disastrous and expensive failure, associated financially with the South Sea Bubble and was not in any way connected with our William Wood. The confusion of the two goes back to an article in *The Gentleman's Magazine* of 1852 (5) in which the anonymous author merely assumed them to be one and the same person, but there is written evidence that the "notorious" Wood was still alive and involved in litigation over his ill-founded scheme in 1746, sixteen years after his namesake's death (6).

In 1728 William Wood turned his mind to a method of smelting iron with coal or coke instead of charcoal, a process that had already been introduced by Abraham Darby in 1709, but employing a reverberatory furnace instead of the blast furnace relied upon by Darby. With two of his sons, Francis and Charles, and one Kingsmill Eyre he petitioned the crown for a charter as Governor and Company of Ironmasters of Great Britain with a capital of one million pounds and erected a plant at Frizington near Whitehaven in Cumberland but his death at only fifty-nine in 1730 left the two sons in charge. Trials of his smelting process were unsuccessful and by 1733 the whole enterprise had collapsed and in consequence Charles was gazetted bankrupt.

### **Charles Wood's Appointment in Jamaica**

This was the turning point in Charles Wood's career and after a short period spent in Carolina he returned to Cumberland where, in 1735, he married Anne Piele of Buttermere. Early in the following year his fortunes improved when he was appointed to superintend some lead mines situated in Liguanea in Jamaica and "to give directions for the erecting proper furnaces to smelt the ore from the said mines and to instruct negroes in the working of the said mines and furnaces" (7). This post, carrying a salary of two hundred



### William Brownrigg 1711–1800

A native of Cumberland, Brownrigg combined a distinguished scientific career with a modest and retiring nature. After taking his M.D. in Leyden he settled down to practice medicine in Whitehaven and was elected a Fellow of the Royal Society in 1742. He became friendly with Charles Wood, who passed to him the specimens of platinum, but although Brownrigg later carried out one or two experiments on them he passed them on to the Royal Society with a letter describing their source and giving details of Charles Wood's preliminary experiments. This communication quickly led to more extensive investigations on the properties of platinum

From a portrait painted in about 1790 formerly in the Board Room of the Whitehaven Hospital

pounds a year, was offered to him by a William Poyntz (1682–1748) a member of a family that had for many years been associated with the West Indies, but unfortunately the life of the mine was to prove short indeed. One account of the history of Jamaica, written in 1756, records that

“lead ore likewise abounds here . . . but it is not found in any regular bodied veins which, among other reasons, obliged the gentlemen who had been engaged in the lead works of Liguanea to drop the undertaking after they had been at a great expence in building a very compleat set of works and carried on the manufacture for some time” (8).

Family records compiled by one of the great-grandsons of Charles, Mr. M. H. Wood, (9), show that the first child of his marriage was born in Jamaica in May 1739 while a second child arrived in March 1742 in Whitehaven, showing that somewhere between these dates he returned with his wife to England. It was during his period on the lead mines that there came into his possession some specimens of platinum, no doubt smuggled from Cartagena, and after carrying out a few preliminary experiments with them he carried them back to

England and presented them to William Brownrigg, a distinguished scientist who preferred to engage in general practice as a medical man in Whitehaven. Brownrigg was to play a vital part in disseminating the news of Wood's findings, but not for some time to come.

Nothing is known of Charles Wood's activities between 1741 and 1747 when he was appointed Assay Master to the Governor of Jamaica. His description as Assay Master during his earlier period in the island, so often stated in the literature, is erroneous, as the post was not created until a law was passed at Westminster stating among other things that:

“from and after the first day of September in the year of Our Lord one thousand seven hundred and forty seven it shall be lawful for the governor to nominate and appoint one or more assay masters” (10).

Recent research by Mr. Robert Barker has confirmed that Wood accepted this post, while he has found a number of pieces of silverware made in Jamaica between 1747 and 1749 bearing Wood's initials as assayer (11). In the latter year Wood relinquished the post, however, and again came home to England, now returning to his iron working by setting up a forge at Low Mill near Whitehaven. In this enterprise he had as his associates several

Part of the letter from William Brownrigg read by William Watson to the Royal Society on December 13th 1750. In this he refers to Charles Wood as "a skillful and inquisitive metallurgist", going on to say that he "was not ambitious of appearing in print"

This Semi-meral was first presented to me about nine Years ago, by Mr. Charles Wood, a skillful and inquisitive Metallurgist, who met with it in *Jamaica*, whither it had been brought from *Carthagena* in *New Spain*. And the same Gentleman hath since gratified my Curiosity, by making further Inquiries concerning this Body. It is found in considerable Quantities in the *Spanish West Indies* (in what Part I could not learn) and is there known by the Name of *Platina di Pinto*. The *Spaniards* probably call it *Platina*, from the Resemblance in Colour that it bears to Silver. It is bright and shining, and of a uniform Texture; it takes a fine Polish, and is not subject to tarnish or rust; it is extremely hard and compact; but, like Bath-metal, or cast Iron, brittle, and cannot be extended under the Hammer.

members of a family named Spedding, one of their sisters having married Brownrigg in 1741. It can be well imagined that Wood now prompted Brownrigg to take an interest in the specimens of platinum that he had been given some nine years earlier and this was indeed what happened. In 1742 Brownrigg had been elected a Fellow of the Royal Society after carrying out researches on "fire damp" at a time when the dangerous exhalation of methane in coal mines was unknown.

### The Smuggled Platinum Samples

The specimens brought home by Charles Wood included some platinum grains mixed with black sand, some native platinum grains separated from the sand, some platinum that had been melted after alloying with other metals, and a piece of platinum that had formed part of the pommel of a sword. Now Brownrigg's papers to the Royal Society had been read for him by his friend William Watson (1715-1782) and it was to Watson that he finally wrote an account of these specimens and of Wood's initial experiments upon them, asking him to communicate this to the Royal Society. Watson was quick to comply with this request and on December 13th 1750 he read the letter to the Society and presented them with the specimens (12). In the covering letter

sent to Watson, William Brownrigg wrote:

"The experiments which I have related were several of them made by a friend whose Exactness in performing them and Veracity in relating them I can rely upon".

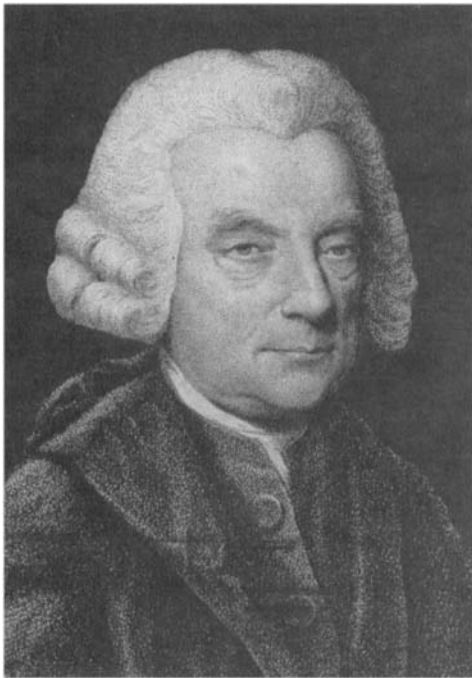
An extract from the main communication is illustrated here, and the paper goes on to detail the preliminary tests that Wood had carried out:

"When exposed by itself to the Fire, either in Grains, or in larger Pieces, it is of extreme difficult Fusion; and hath been kept for two Hours in an Air Furnace, in a Heat that would run down cast Iron in fifteen Minutes: Which great Heat it endur'd without being melted or wasted; neither could it be brought to fuse in this Heat, by adding to it Borax, and other saline Fluxes . . .

When exposed to a proper Degree of Fire, with Lead, Silver, Gold, Copper or Tin, it readily melts and incorporates with these Metals; rendering the Mixture, like itself, extremely hard and brittle.

Having been melted in an Assay Furnace, on a Test with Lead, and therewith exposed to a great Fire for three Hours, till all the Lead was wrought off, the Platina was afterwards found remaining at the Bottom of the Test, without having suffered any Alteration or Diminution by this Operation.

A Piece of Platina was put into strong and pure Aqua Fortis, and therewith placed in a Sand-heat for twelve Hours: The Platina, when taken out of the Aqua Fortis, was found of the same Weight as when put into it; being in no-wise dissolved or corroded by that Menstruum."



**William Watson  
1715–1787**

Well known for his researches on electrical phenomena, Watson was elected to the Royal Society in 1741. He was a most active Fellow and it was to him that Brownrigg passed the samples of platinum with a request that he should read the accompanying letter to the Society. Almost immediately he wrote to his friend Professor Boscovich conveying to him the news of this “newly discovered metal in South America” and Boscovich published the account in German, so alerting scientists throughout Europe to Wood’s discovery. In the last year of his life Watson was knighted for his services to science

Thus it may be claimed that it was the enterprise of Wood in conducting preliminary experiments on smuggled platinum which he brought to England from Jamaica and the dissemination of his findings in the Philosophical Transactions of the Royal Society that established him as the first scientific investigator of the properties of this remarkable metal. The involvement of Watson undoubtedly hastened publication and discussion of Wood’s work throughout Europe, leading to further investigations and published papers by German, Swedish, French and Spanish scientists (13).

However the key link was provided by Brownrigg, the modest English country doctor who had the foresight to perceive that:

*“Upon the whole this Semi-metal seems a very singular Body that merits an exacter Inquiry into its Nature than hath hitherto been made, since it is not altogether improbable that, like the Magnet, Iron, Antimony, Mercury and other metallic substances, it may be endowed with some peculiar Qualities that may render it of singular Use and Importance to Mankind”.*

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- 4 Sir John Craig, “Newton at the Mint”, Cambridge, 1946, p. 116
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- 7 Memorandum of Agreement, 1736, kindly lent by Air Commodore F. J. P. Wood
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