= Pierre @-@ François Chabaneau =

Pierre @-@ François Chabaneau (1754 @-@ 1842) was a French chemist who spent much of his life working in Spain . He was one of the first chemists to succeed in producing malleable platinum . Chabaneau was born in Dordogne , France , and died near his home village at the age of 88 years .

= = Early life = =

Chabaneau was born in 1754 in Nontron , a village in the Dordogne department of France . His uncle , a member of the order of Saint Anthony , encouraged him to study theology . While Chabaneau excelled in his studies , his distaste for metaphysical speculation led him to antagonize his teachers , which in turn caused him to be expelled from school .

Sympathetic towards Chabaneau 's state of poverty , the director of a Jesuit college in Passy offered him a position as a mathematics professor , despite Chabaneau having only a basic understanding of arithmetic . In studying the material for the next day 's lessons , Chabaneau taught himself algebra and geometry . His academic interest soon spread to physics , natural history , and chemistry . At the age of twenty , Chabaneau was convinced to join the newly established Real Seminario Patriotico at Vergara to teach French and physics by brothers Fausto and Juan José Elhuyar . The two brothers , who later made a name for themselves by isolating metallic tungsten , had been hired by the Count of Peñaflorida , who had sent them to France to find professors for the Vergara Seminary .

= = Platinum research = =

After the Elhuyar brothers isolated metallic tungsten in 1783 , Chabaneau collaborated with them in researching platinum . This did not last long , though , as the brothers had been appointed Directors General of Mining , and soon left Spain for South America . King Charles III created a public chair of mineralogy , physics and chemistry for Chabaneau in Madrid and provided him with a laboratory for his research . The Count d 'Aranda secured the government 's entire supply of platinum for Chabaneau 's laboratory .

Chabaneau was able to easily remove most of platinum 's natural impurities , including gold , mercury , lead , copper , and iron , leading him to believe that he was working with pure platinum . However , the metal displayed inconsistent characteristics . At times it was malleable , yet at times it was highly brittle . Sometimes it was entirely incombustible , yet sometimes it burned readily . These inconsistencies were a result of various impurities : rhodium , palladium , osmium , iridium , and ruthenium . These elements would later come to be known as the platinum group metals , but at the time of Chabaneau 's research , they had not yet been discovered .

So frustrated was Chabaneau by his research that , in 1786 , he lost his temper and smashed all of his equipment , exclaiming , " Away with it all ! I 'll smash the whole business ; you shall never again get me to touch the damned metal ! " Nevertheless , three months later Chabaneau presented the Count d 'Aranda with a 10 cm cube of pure malleable platinum . His process , involving powder metallurgy and intense heating , was kept secret until 1914 .

= = Platinum age and death = =

Chabaneau realized that the sheer difficulty of working with platinum would lend value to objects made from it . He and Don Joaquín Cabezas carried on a lucrative business producing platinum ingots and utensils . This marked the beginning of what is now known as the " platinum age in Spain , " during which nearly 18 @,@ 000 troy ounces of malleable platinum were produced in a span of 22 years . The platinum age ended in 1808 when Chabaneau 's laboratory was destroyed during Napoleon 's second invasion .

In 1799 , Chabaneau returned to France seeking rest near his native village of Nontron . There he remained until January 1842 , when he died at the age of 88 years .