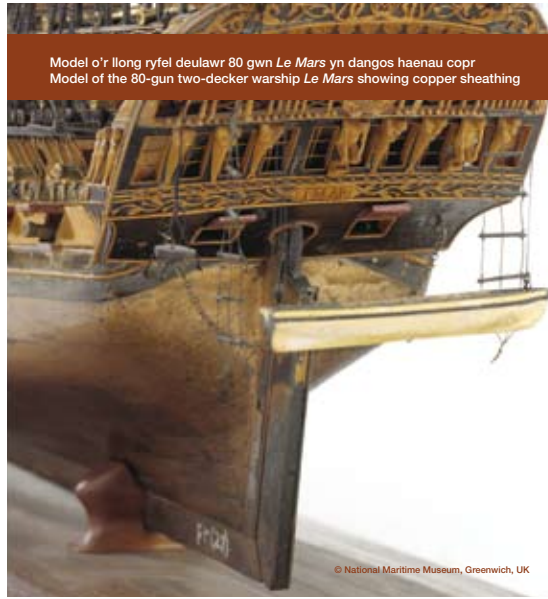


# LLONGAU BUDDUGOLIAETHUS COPPER-BOTTOMED VICTORIES

Brwydro rhwng y Mars a L'Hercule ar noson 21 Ebrill 1798  
Action between the Mars and L'Hercule on the night of 21 April 1798



Model o'r llong ryfel deulawr 80 gwn Le Mars yn dangos haenau copr  
Model of the 80-gun two-decker warship Le Mars showing copper sheathing



Defnyddwyr domestig mwyaf copr Cymru tua diwedd y ddeunawfed ganrif oedd llongau Llynges Prydain a'r llynges fasnachol. Roedd rhyfeloedd a masnachu byd-eang cynyddol yn mynd â llongau'n rheolaidd drwy ddyfroedd trofannol lle'r oedd pryfed llongau'n achosi cryn ddifrod i gyrff pren y llongau. Ym 1761 dechreuodd y Llynges Frenhinol ddefnyddio llenni copr yn haen amddiffynnol ar eu llongau.

Roedd haen gopr hefyd yn rhwystro cregyn llong rhag glynu wrth gyrff llongau, gan ganiatáu i'r cychod deithio yn gyflymach ac yn haws eu llywio. Yn fuan wedyn dechreuodd llynges Ffrainc a gwledydd eraill wneud yr un peth, er bod y llenni oedd wedi eu rhoio'n llyfn ar llongau Prydain yn cael eu hystyried yn rai gwell.

Ond erbyn dechrau'r 1780au cafodd y defnydd o haen gopr ei roi o'r neilltu. Roedd yn adweithio'n wael i'w ffasinâu haearn, gan achosi i'r llenni ymddatod oddi wrth gorff y llong. Daeth yr ateb ym 1783 pan ddatblygwyd bolltau copr caled wedi'i rhoio'n oer. Un o'r prif gyflenwyr oedd Cwmni Mwynglawdd Parys Thomas Williams.

Ym 1832, dewis rhatach yn lle copr oedd 'metel melyn'. Codwyd patent ar yr aloi copr hwn gan George Frederick Muntz o Birmingham ac fe'i cynhyrchwyd mewn nifer o'r gweithfeydd yn ne Cymru.

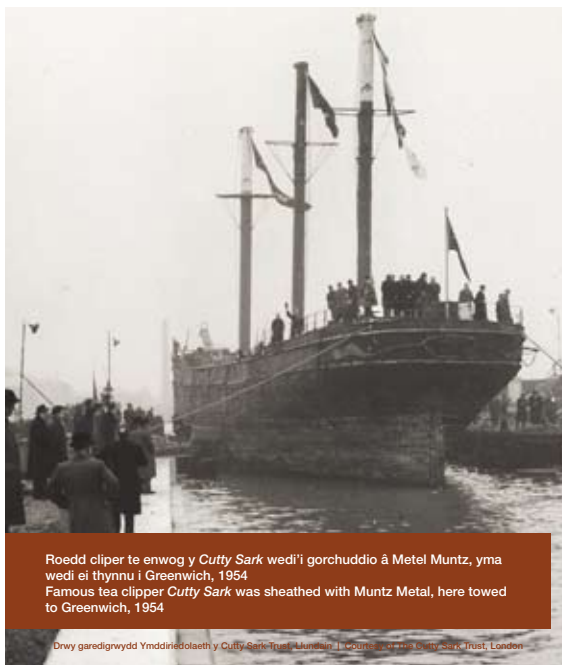
The biggest domestic consumers of Welsh copper in the later eighteenth century were the British naval and merchant fleets. War and growing world trade took ships regularly through tropical waters where ship worms caused considerable damage to wooden hulls. In 1761 the Royal Navy began using copper sheets to sheath and protect their ships.

Copper sheathing also prevented barnacles from attaching to hulls, allowing the vessels to travel faster and with more manoeuvrability. The French and other navies soon followed suit, although the smooth-rolled sheets on British ships were considered to be superior.

By the early 1780s however copper sheathing was almost abandoned. It reacted badly with its iron fastenings, causing the sheets to come away from the hull. The solution came in 1783 when cold-rolled hardened copper bolts were developed. A key supplier was Thomas Williams's Parys Mine Company.

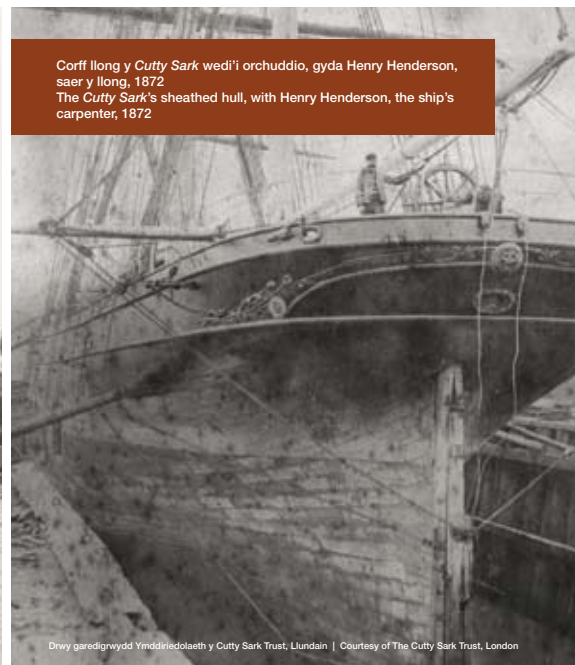
In 1832 a cheaper alternative to copper was 'yellow metal'. This copper alloy was patented by George Frederick Muntz of Birmingham and manufactured in several of the south Wales works.

Effaith llongbryfed ar bren  
The effect of ship worm on wood



Roedd clipper te enwog y Cutty Sark wedi'i gorchuddio â Metel Muntz, yma wedi ei thynnu i Greenwich, 1954  
Famous tea clipper Cutty Sark was sheathed with Muntz Metal, here towed to Greenwich, 1954

Corff llong y Cutty Sark wedi'i orchuddio, gyda Henry Henderson, saer y llong, 1872  
The Cutty Sark's sheathed hull, with Henry Henderson, the ship's carpenter, 1872



Drwy garedigrwydd Ymddiriedolaeth y Cutty Sark Trust, Llundain | Courtesy of The Cutty Sark Trust, London