

42: Cleaveland jig and IHC jig – 1980s research in USA and Holland



**Figure 92. IHC JIG PLANT**  
An IHC jig plant recovering fine gold in Sumatra, Indonesia. (photo: IHC Holland – www.ihcholland.com)

The Cleaveland jig was invented by Norman Cleaveland of New Mexico and patented in 1982 (US #4,310,413). The jig is an innovative circular jig intended for large tin dredges, a compact star-pattern of jigs with the slurry introduced at the centre [93].

IHC Holland of the Netherlands and Alluvial Dredges Ltd (ADL) of Scotland and Australia made Cleaveland-type jigs. IHC made vast research into jigs led by the Mineral Technological Institute (MTI) in the Netherlands [94-97]. IHC developed the Cleaveland jig further as a circular array of trapezoidal jigs with sawtooth jiggling motion, a motion now emulated in most jigs. The short-lived fierce upward stroke prevents the loss of fine gold by suppressing the phase of hindered settling is suppressed. IHC marketed its jigs for large tin dredges. After the tin price collapsed, IHC marketed the 'IHC trapezoidal jig' for recovery of placer gold, hardrock gold and diamonds on dredges, pontoons and dry land [98-105].

**Operation**

Feed is screened to <12.5mm and pumped as slurry to the narrow end of the primary jig bed of the IHC jig plant. The trapezoidal shape of the jig bed widens towards the tailings end to counteract and minimise the unwanted acceleration in cross-flow typical of a normal type of jig.

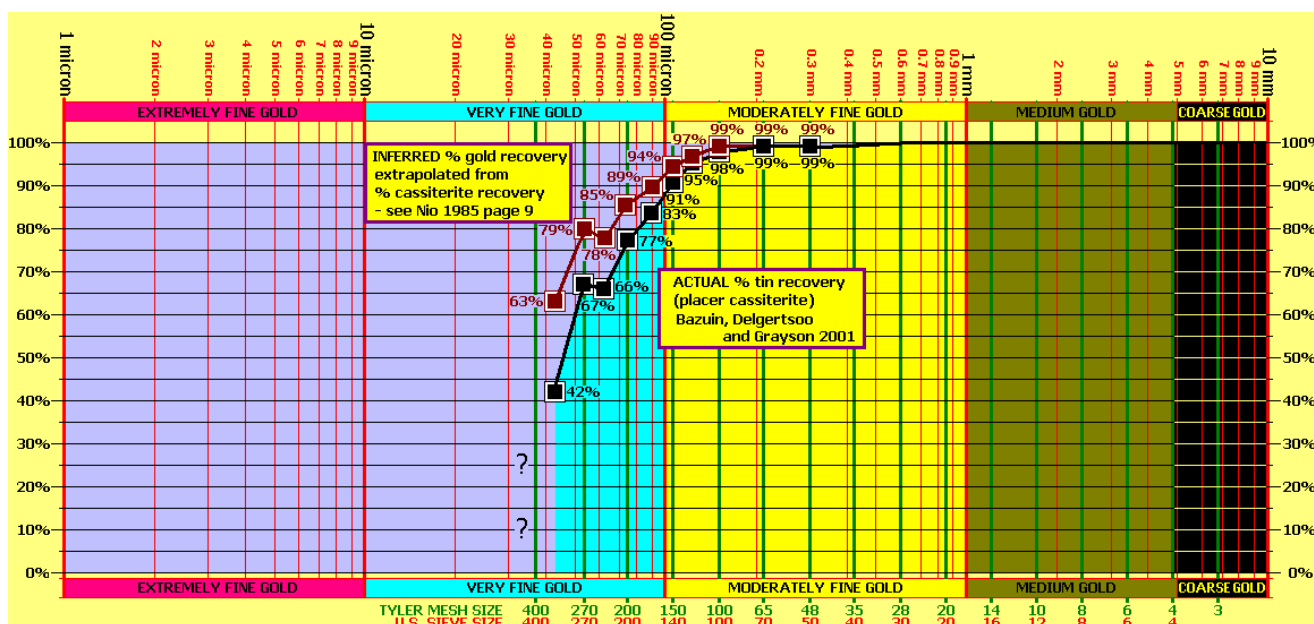
The trapezoidal primary jigs can be clustered in a compact 12-cell star with a single central feed – a major advantage aboard large dredges. In land-based placer gold mining, the optimum configurations are 1-cell, 2-cell and 3-cell trapezoidal jigs otherwise the wash-plant is too bulky and trucking placer becomes excessive [106]. When integrated into a skid-mounted wash-plant the units are semi-mobile [107,108].

The jig screen of the primary jig produces tailings of <6mm that report as slurry to a "second stage", a small secondary jig who jig screen in turn produces tailings of <4mm that are recycled back to the primary jig. A "third stage" is sometimes added to the series.

Coarse gold and nuggets remain on the jig screens for recovery as a batch discharge at clean-up, while small gold is produced as a continuous discharge with black sand via spigots at the bottom of the hutches of the jigs.

**Adoption by placer gold miners**

IHC trapezoidal jigs were installed on the Bema Dredge, a famous bucket-line gold dredge off the coast of Alaska. Several winterised gold bucket-line dredges with IHC jigs operated in NE China. IHC jig-plants of 1, 2 and 3-modules were installed in placer gold mines in Alaska, Peru, Columbia, Ghana, Indonesia, Mongolia and elsewhere, gaining a reputation for recovering >90% of moderately fine gold. Failure to gain wider popularity is attributed to the high price, bulkiness, limited mobility, and low concentration ratio.



**Figure 93. GOLD RECOVERY BY IHC TRAPEZOIDAL JIGS DERIVED FROM CLEAVELAND CIRCULAR JIGS**  
Placer gold recovery extrapolated from recovery of placer tin, as claimed in IHC technical literature. [96] (compiler: Robin Grayson)