

Friends of King Edward Mine

Fact Sheet 1

February 2009

The Holman Laboratory-Sized Shaking Table



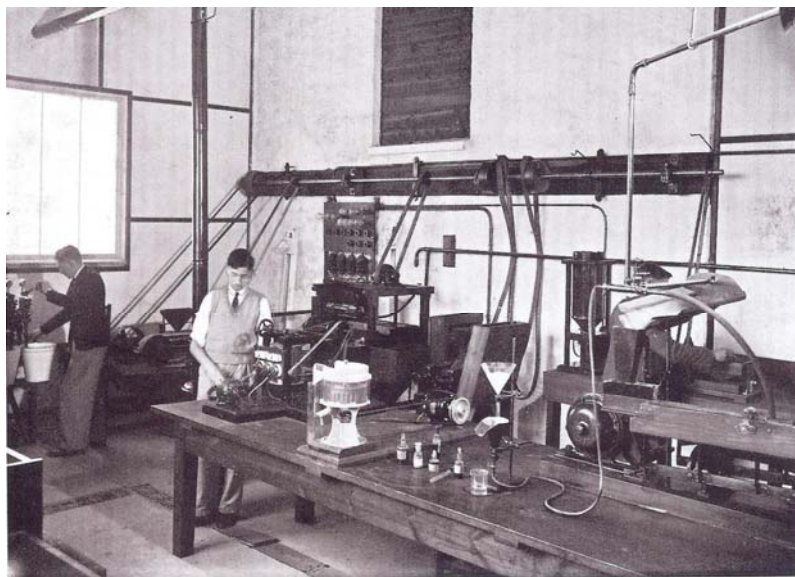
Another example of working mineral processing history has recently been restored and added to the expanding collection at King Edward Mine, Cornwall.

The application of a repetitive ‘bump’ to a bed of ore particles and water on a sloping surface, as an aid to separation and retention, was well established in the German mineral industry in the early years of the 19th century, and large numbers of such batch devices, suspended on chains from the four corners of the deck, were in regular use there on lead and copper minerals. There are references to this type of table being in use both at Tamar Consols lead mine, Devon in 1844, and at the reopened Treweatha lead mine, near Menheniot, Cornwall as late as the 1860’s, while an early type of ‘bumping table’ was also reported as being designed by Robert Stagg and in use at the Nenthead lead mines in 1828. The design of the first truly *continuously operating* shaking table is, however, credited to the great Austrian mineral processing engineer, Paul von Rittinger, in 1857.

Shaking tables do as they say, that is they perform a continuous separation on minerals of differing specific gravity by moving a mixture of particles in water forwards along an elongated, but sideways sloping, deck surface. Feed ore particles and water come on to the table at the back end of the upper side of the table, and a repeating end bump mechanism causes all the particle to move forward, making way for new feed. Raised ‘riffles’, in lines on the deck surface, hold particles on the table in a layer, hindering them from moving too quickly sideways (‘downhill’) in the water flow, and shuffling by the bumping motion encourages the heavier ones to settle to the bottom of the mineral layer while an additional, gentle sideways flow of wash water naturally carries lighter materials further down the slope than the heavier ones. Eventually, distinct bands of minerals are created, which may be kept separate as they leave the table, allowing the separated heavy mineral – usually the more valuable – to be retained and retreated if necessary.

Because of the demonstrable success, many differing makes of the modern ‘end bump’ table came to be developed after 1900, among them being the James table. James tables, with diagonally placed lines of riffles, were manufactured in Cornwall by Holman Bros., and were known as Holman-James tables. They were not only adopted locally for tin ore recovery, but also exported worldwide, and remained a firm favourite from the time they were first introduced.

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In the Assay Laboratory, King Edward Mine

Photo from the 1937 Camborne School of Mines prospectus, entitled "*In the Assay Laboratory, King Edward Mine*". The table is towards the rear on the right hand side. The Assay Laboratory is now the Museum Shop.

The table at King Edward could have been constructed as an experimental one by Holmans. It is shown in a photograph of the new assay laboratory in the Camborne School of Mines prospectus for 1937. The laboratory was relatively new at this time and it can be assumed that the table was probably purchased in 1936. It was 'inherited' by Tony Clarke when he started work as a Mineral Processing technician at King Edward in 1973. It has the classic trapezium shape, angled head motion and riffles, and braced hessian flexing deck supports of the Holman-James shaking table together with the normal adjustments – tilt, stroke, length etc. – and was used for student practical classes, demonstrations and small-scale research work, proving itself a reliable and efficient gravity separator for work on smaller samples. Because of the inherent difficulties in making a miniature conventional head motion, the convenient solution was to incorporate a reduction gearbox between an ordinary 1450 r.p.m. single-phase motor and a scaled down Holman-James 'cam and spring' bumping mechanism to give a normal stroke rate of approximately 270 per minute, and a processing capacity of 10-20 Kg. of material per hour.

Along with other mineral processing equipment from King Edward, it was transferred to the new Camborne School of Mines pilot plant at Trevenon, near Pool, in 1975. Through intermittent use, the original plain linoleum deck had become somewhat cracked over the years, and was replaced in the early 1980's by a more modern white composition rubber material, supplied by the Wilfley Company of Wellingborough in Northants (who had previously acquired the right of manufacture of the Holman-James Table), the original deck riffle pattern being retained at this time.

Later, a pressing need for space in the Camborne School of Mines pilot plant necessitated this table being relegated back into storage in the old mill building at King Edward, while a laboratory-size Wilfley shaking table was retained at Trevenon for experimental purposes. It was extremely fortunate that this Holman laboratory table did not fall victim to any final clearout of redundant equipment prior to or during the establishment of the School's facilities at the new Combined Universities in Cornwall campus at Tremough, near Penryn, since, as far as can be determined at present, it is almost certainly the only one of its kind in Britain, and quite possibly unique.

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Tony Clarke and Eric Rabjohns cleaning and dismantling the table in the mill 17th February 2008.

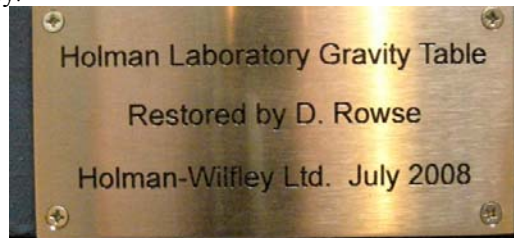


In 2008, interest was shown in the table by the S.G.S. mineral processing labs based at the former Wheal Jane site, near Truro. In addition to performing sophisticated and varied mineral processing consultancy work, this company manufactures both Wilfley and James gravity concentration tables of varied capacity and they wanted to take a close look at its construction and mechanism. In return, they very generously offered to check and mechanically overhaul the entire table.



Holman laboratory table when returned to King Edward fully reconditioned

The majority of this renovation was undertaken by Dave Rowse and when returned to King Edward a small plaque was attached to record this fact. The table is now restored to its former glory, in the familiar 'Wilfley Blue' livery.



Many thanks to Tony Clarke who supplied the overwhelming majority of the information for this fact sheet.

Bibliography

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