ARTHUR J HUGHES
of
HENRY HUGHES & SONS

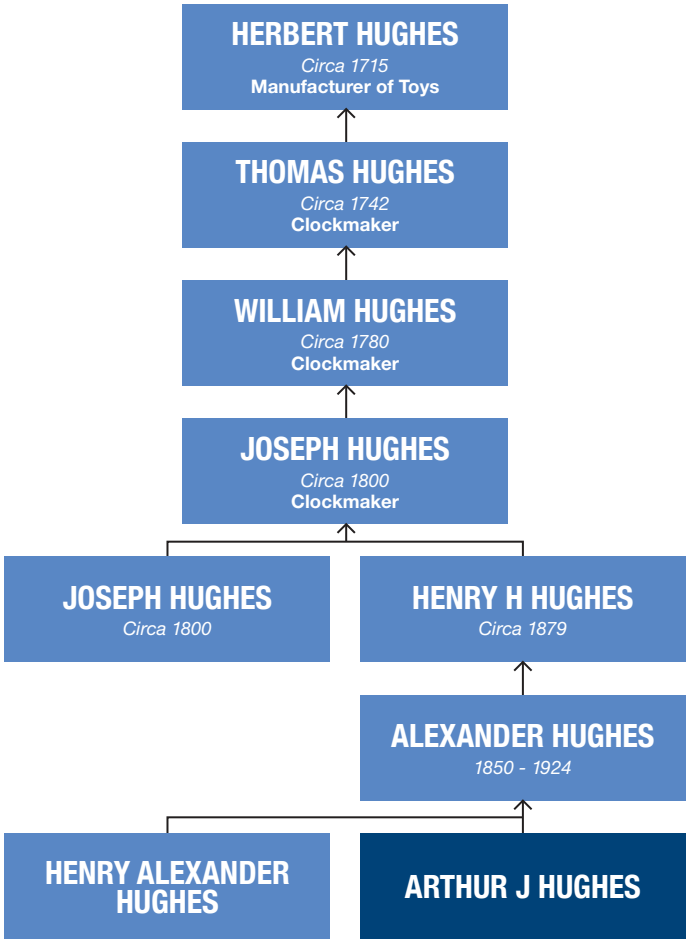
HISTORY CAN BE EASILY MISINTERPRETED SO IN WRITING ABOUT THE HUGHES SIDE OF KELVIN HUGHES LTD WE NEED LOOK NO FURTHER THAN AN UNDATED MEMOIR WRITTEN BY ARTHUR J HUGHES THAT IS HELD IN THE COMPANY'S ARCHIVES.

Arthur Hughes was part of the Henry Hughes & Sons business from his youth where he studied the art of making nautical instruments in the company's workshop. Working long 11 hour days, he learnt his craft from the men who had been making compasses using techniques that dated back 200 years.

Mr Hughes recalls **"A good man would earn £2 a week and he got no holiday except Christmas and Bank Holiday, but the old firms took the men for a beano in Epping Forest in summer time".**

Arthur worked through the ranks of the company learning and honing his skills eventually becoming Managing Director in 1924.

Passing through two world wars he witnessed extraordinary change and contributed heavily to the growth and expansion of the company.



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TOYS TO MASTER CLOCKMAKER

The history of the Hughes family appears to date back to 1715 where Herbert Hughes was shown as a manufacturer of ‘toys’.

It is purely conjecture but perhaps some of these toys were clockwork as at some point the Hughes family turned their attention to the world of clock manufacturing and navigational instruments.

Herbert’s son Thomas Hughes became a famous clockmaker becoming Master of the Clock Makers Company in 1742.

He was followed in this trade by his son William Hughes who also became a Master Clockmaker in 1765.

William Hughes Trade Card

CHRONOMETERS TO SEXTANTS

It is unclear when the company started manufacturing navigation equipment but working from Fenchurch Street in London they were in the heart of numerous ‘Garret Workshops’ in which skilled men from father to son had manufactured equipment for the leading navigation equipment suppliers of the day.

Larger firms like James White of Glasgow (who formed an alliance with William Thompson who later became Lord Kelvin) employed a small number of men but relied more on those who worked at home.

Home workers would obtain the material they needed from a company then return with the finished goods. These groups of men were independent, relying on their skills and occasionally drifting from one port to another. When work was hard to come by they would make a little money by ‘other’ means. Arthur recounts a tale of one sextant maker, Jack Hubbard, would take a month off, do some training, and have a prize ‘boxing’ fight in the East End of London in a local pub.

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HUGHES VERSUS KELVIN

The names of Kelvin and Hughes met long before the two companies merged during the later parts of Wold War II. Alas this meeting of the two companies was not pleasant as in 1895 Arthur recalls that he had to leave school because the family finances were strained by an action taken by Sir William Thomson (later Lord Kelvin) against his father, Alexander Hughes.

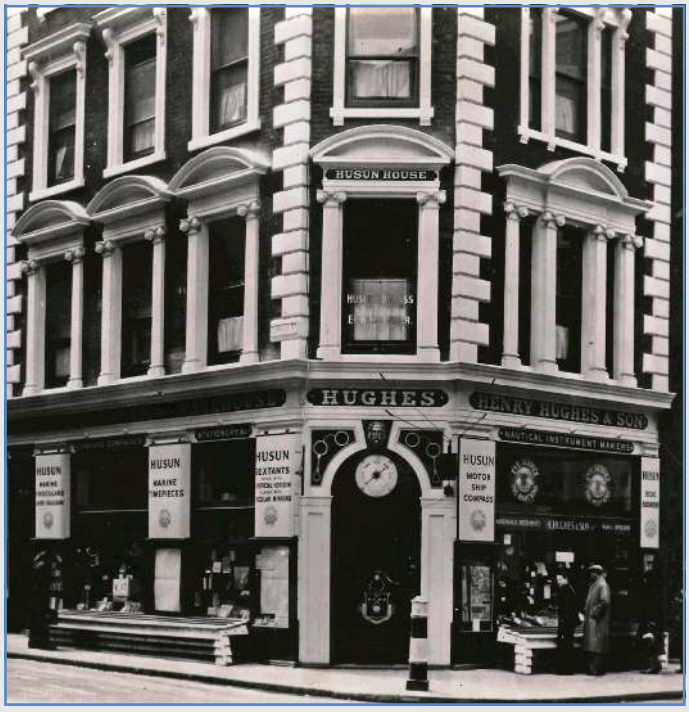
The court action was for infringement of Thompson's Patent for Light Compass Cards and as the main witness in Hughes's defence was abroad and could not attend court, they lost the case and had to pay Sir W. Thompson £1,000 (£50,000 in today's money) and heavy court costs.

TO LONDON

In 1840, Henry Hughes moved the business to Fenchurch Street in London where the company was able to take advantage of the growing shipping trade that was then centralised just above the Pool of London and the Tower of London.

The days of sailing ships were passing and steamships were filling the new London Docks.

The entrance to this shop was fitted with a master clock which gave Greenwich Mean Time. At 12 O'clock, tall ship owners in top hats would cluster round the door, watch in hand, to check the time and set their ships' chronometers.



The Hughes shop in Fenchurch Street photographed during the 1940's

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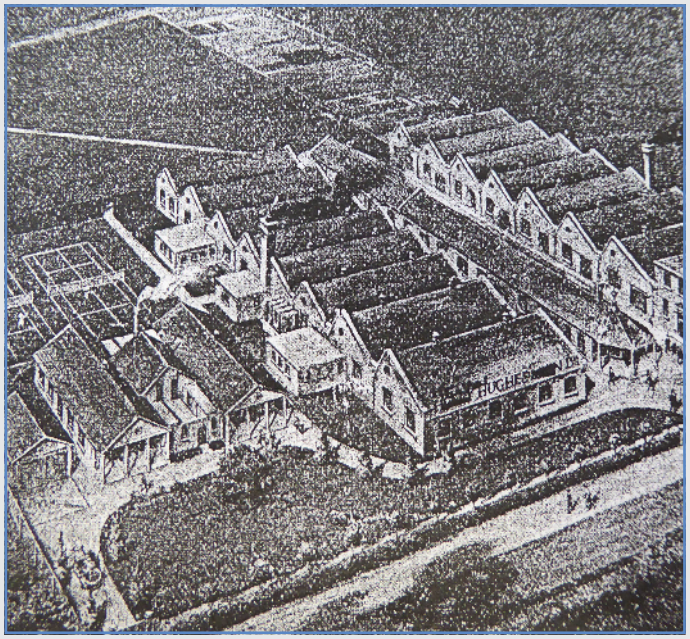
SEXTANTS TO COMPASSES

In approximately 1910 Arthur Hughes decided the company should enter the Compass business and dressed in a top hat which Arthur described as 'the official rag in those days' he went to Chatham Dockyard.

He returned disheartened finding that there were no written specifications and drawings for compasses. All that could be found out about a compass was by looking at the units and being told the details by the Chief Examiner of Compasses.

However Hughes persevered and finally had a compass fitted and approved for use in HMS New Zealand.

A Hughes Transmitting Compass circa 1934 from the Kelvin Hughes collection



The Hughes factory in New North Road photographed in approximately 1930

Contracts began to flow and they moved the manufacturing facilities to a new factory at Forest Gate and in 1915 to a new site purchased in New North Road, Barkingside. This site was used by the Kelvin Hughes Group until we relocated to Enfield, North London in 2012.

Research in the then new Barkingside facilities turned to aircraft navigation. This presented numerous challenges when compared to nautical navigation however, these issues were resolved and by 1916, some 50,000 compass units had been produced as part of the 1st World War effort.

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The company was busy for a few years after the war but the falling off of trade at home and the 1920 depression reduced the number of workers at the New North Road site from 1,000 to 250, just enough to keep it alive. Harry Harvey (Kelvin Hughes's unofficial historian) reported that in this period the company would turn its hand to anything and at one point was producing cast iron manhole covers.

Despite the turn down in trade, the success of the aircraft compass lead to the Admiralty placing the first contract for an Aperiodic Compass. For many years the Hughes 'P.4 compass' was the master compass in aviation all over the world and was used in many of the world's great classic flights.

In 1926, the Hughes Company were invited by the Admiralty to take over research and development of the Echo Sounder invented at the Admiralty Research Laboratory at Teddington, London. In 1930 the first magnetostrictive oscillator for an Echo Sounder was produced being hailed as the most powerful and accurate source of Echo Sounding in the world. This had an unexpected spinoff with sales increasing as fishing fleets realised that the sonar could be used to detect fish.

In the inter-war years, Hughes continued to seek to improve on aircraft navigation. The 'Booth Bubble Sextant' was invented at Farnborough and Hughes was given the first contract of 25. Trials were made all over the world and with longer and faster flights being made, a method of finding position by sextant in the air was gradually evolved.

MKIV Bubble Sextant from the Kelvin Hughes collection

By 1935 many secret meetings were held at the Hughes offices and by 1937 the first working model of a bubble sextant was made and tested.

The Type Mark IX Averaging Sextant was accepted in 1939 and thirty sextants were delivered for trials.

Production followed in 1940, 2,000 were delivered rising to 500 a month.

By the end of World War 2, Arthur Hughes reported that 70,000 units had been manufactured and used by the allies.

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In 1941 the offices of both Henry Hughes & Sons and Kelvin Bottomley & Baird were destroyed in the blitz and these old competitors joined forces to become Kelvin & Hughes.

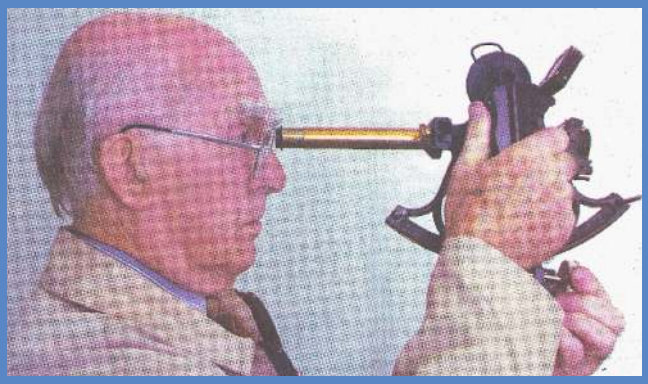
Arthur Hughes concluded his memoirs with the following:

Navigation (that useful part of the mathematics) is a science which has been highly valued by the ancients, especially by our ancestors of this island it being indeed the beauty and bulwark of England, the wall and wealth of Britain, and the bridge that joins it to the universe.

IN MEMORY OF HARRY HARVEY - 1922 TO 2016

We must sadly report the passing of Harry Harvey, a former employee of Kelvin Hughes.

Harry joined Kelvin Hughes at the young age of 14 and, with the exception of his war service as a pilot in the RAF, he spent his entire career with the company.



After his retirement in 1989 Harry became our unofficial historian cataloguing and documenting the long history of the company.

These archives are now held at the Redbridge Central Library in Ilford where the result of his tireless work can be seen.

It's through Harrys work that we are able to chart our history in these publications and the company wishes to recognise his work.

This history series was compiled by **Mr William Wallis** - Technical Publications Manager. For the last 5 years Will has been researching the history of the company and has spent hours of his spare time putting together this series. We thank him for enabling us to have a detailed accurate record on file once and for all.