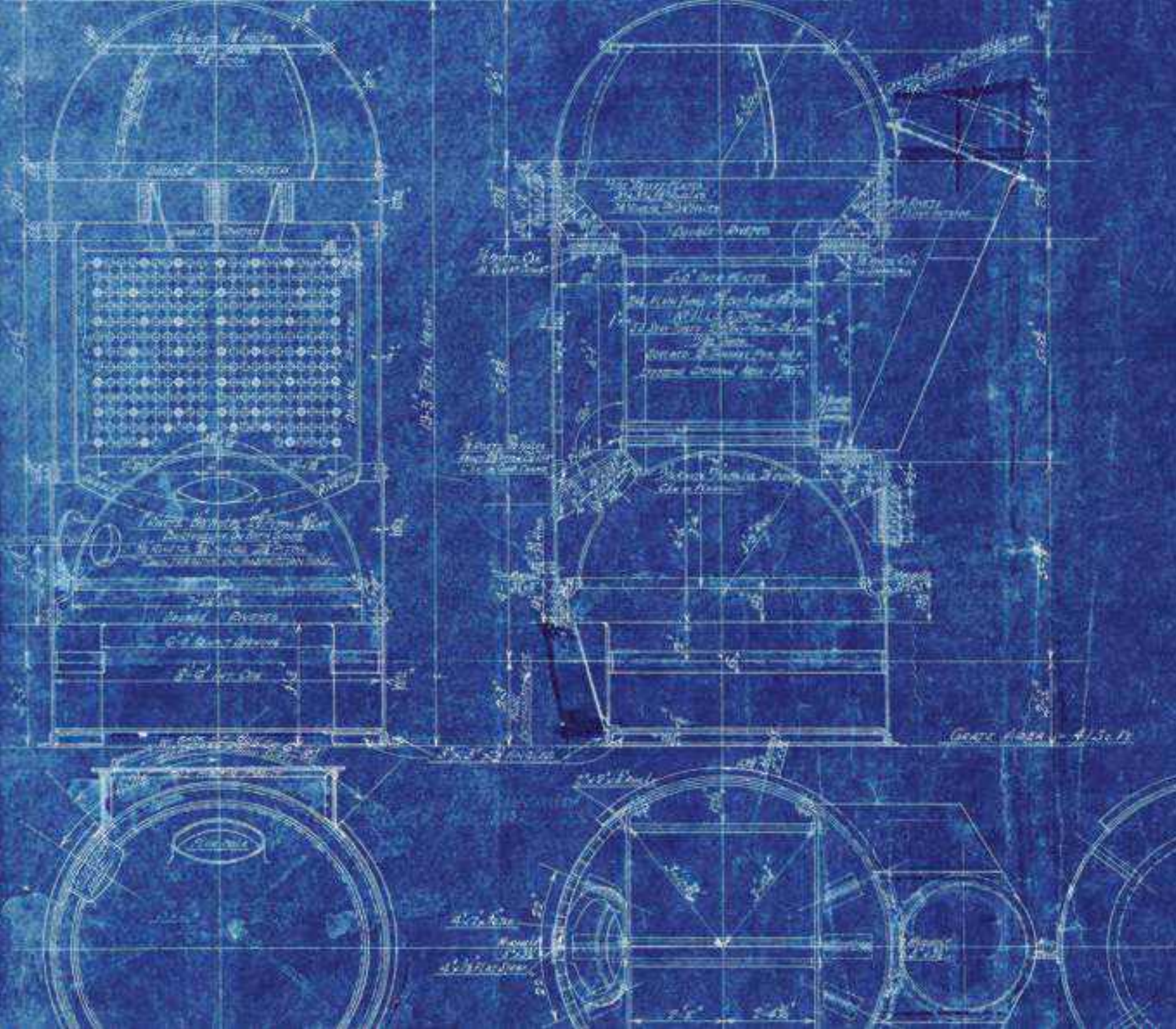
1898 2023

COCHRAN

ENGINEERING EXCELLENCE AT NEWBIE



FORMED IN 1878 BY JAMES TAYLOR COCHRAN AND EDWARD CROMPTON, COCHRAN & CO WAS FOUNDED AT BIRKENHEAD, MERSEYSIDE ON THE BACK OF EDWARD CROMPTON'S REVOLUTIONARY PATENTED VERTICAL STEAM BOILER DESIGN.

THRIVING IN THE MELTING POT OF VICTORIAN ENGINEERING INNOVATION, THE COMPANY WENT FROM STRENGTH-TO-STRENGTH; ENCOMPASSING BOILERMAKING, SHIPBUILDING AND EVEN THE CONSTRUCTION OF THE WORLD'S FIRST STEAM POWERED SUBMARINE.

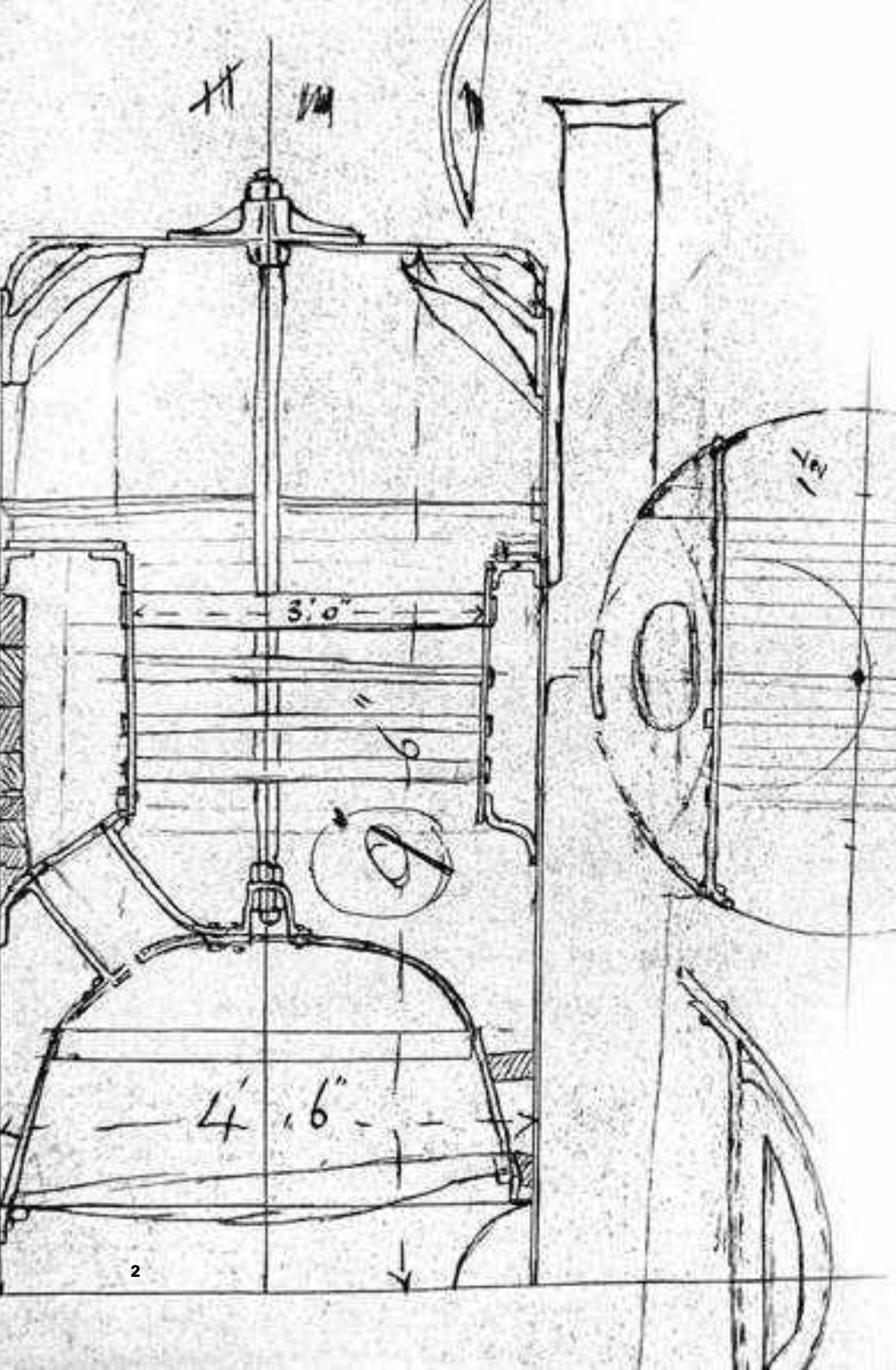
BY 1898, THE COMPANY'S RAPID, SUSTAINED EXPANSION DEMANDED A MOVE TO A NEW, LESS OVERCROWDED LOCATION THAN THE MERSEY BASIN. EXTENSIVE RESEARCH IDENTIFIED AN IDEAL 52 ACRE SITE WITH DIRECT ACCESS TO THE SEA AT ANNAN IN SOUTHERN SCOTLAND.

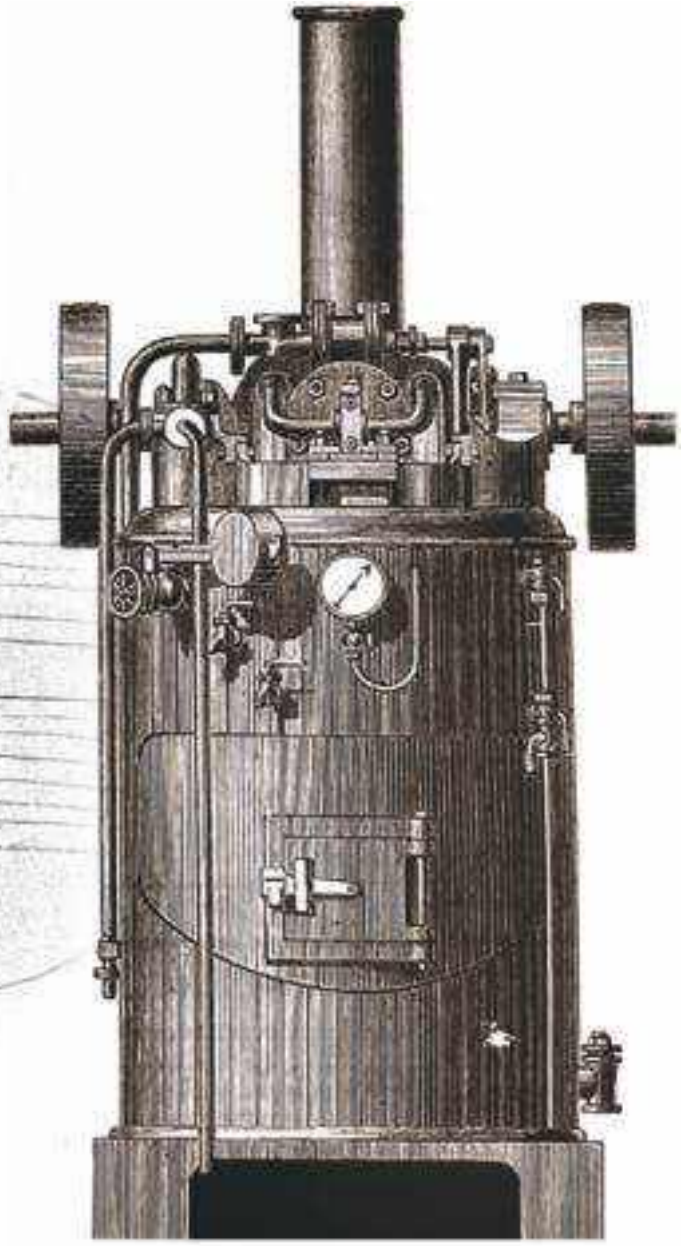
TODAY, AFTER 125 YEARS AT NEWBIE, THE COMPANY LOOKS FORWARD TO AN EXCITING FUTURE UNDER STRONG GUIDANCE AND WITH THE SUPPORT OF AN EXCEPTIONAL WORKFORCE.

HAVING SET THE STANDARDS IN BOILER MAKING FROM ITS EARLIEST DAYS 145 YEARS AGO, TODAY WE CELEBRATE THE ACHIEVEMENT OF REACHING 125 YEARS OF MANUFACTURING EXCELLENCE AT OUR ANNAN BASE; SOMETHING WE ARE ALL IMMENSELY PROUD OF AND GRATEFUL FOR THE CONTRIBUTIONS OF EVERY EMPLOYEE, BOTH PAST AND PRESENT.

1898 2023

COCHRAN





The original 1876 sketch of what would become the Cochran boiler and, above, a very early Cochran boiler displayed at the Kilburn Show in 1879.

The Early Days

It was in the latter years of the 19th Century that visionary British entrepreneurialism saw the formation of Cochran breaking important new ground during the golden age of Victorian Engineering excellence. The firm's founders were key innovators, prime movers who made waves at a time when Great Britain was the industrial powerhouse of the world. Unafraid to challenge convention, their work was nothing less than pioneering, both in the building of ships and more crucially, in the construction of industrial boilers.

James Taylor Cochran

Those men were James Taylor Cochran and Edward Crompton. Both were experienced Engineers; Crompton was originally a superintendent engineer with the firm Alfred Booth and Co in Liverpool, a trading, leather and merchant shipping company. Cochran had served his apprenticeship at the Britannia Engine Works in Birkenhead. The company was owned by his uncle James Taylor, who is recognised as the father of the British steam crane. At first trading as James Taylor & Co, 'Engineers and Boiler Makers'. 'Britannia Engine Works' was added into the company name later.

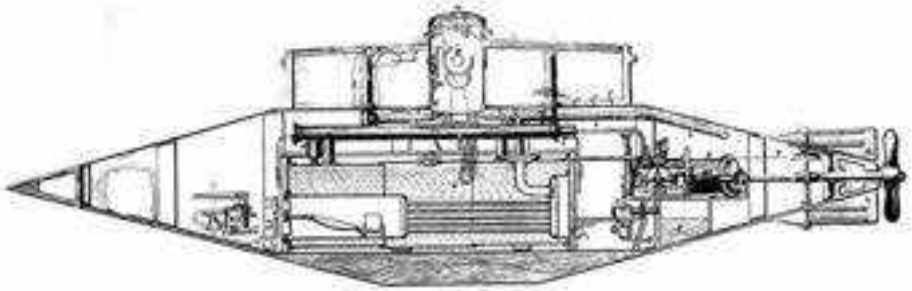
It was in 1876 that Edward Crompton patented a revolutionary upright boiler which combined improved efficiency with a reduced footprint. In 1878 Crompton went into partnership with James Taylor Cochran, establishing the Cochran & Co Engineering Works at Bidston Wharf, 54 Duke Street, Birkenhead.

History has proved that forging an alliance with Crompton was the cleverest move Cochran could have made for his fledgling firm. With the innovative Crompton the new company turned the world of boiler design 'on its head'. The key feature of his new design was the introduction of horizontal fire-tubes into a vertical cylindrical shell through the use of flanged tube plates. This design first showcased at the 1878 Royal Agricultural Show in Bristol during the Company's inaugural year.

Edward Crompton

The new design was compact like a vertical unit but with the improved efficiency of a tubular boiler. Unlike many static boilers of the time, the firebox was integral and, with the chimney simply bolting to the side, the unit formed a complete, rapidly installed package that offered the user all the advantages of compact, easily portable steam power.

Initially shipbuilders, specialising in steam launches, tugs, yachts, cargo steamers, they also supplied many shallow draft vessels which were exported to South America, Egypt and Bolivia. Within its first year, Cochran was approached by the Reverend George William Garrett who had designed a submersible vessel a year earlier. This was a small wooden egg-shaped vessel which was man-powered which he named the 'Garrett Submarine Boat'. Although the system worked, it was not considered much of a weapon. So, Garrett thought again, and he thought BIG.



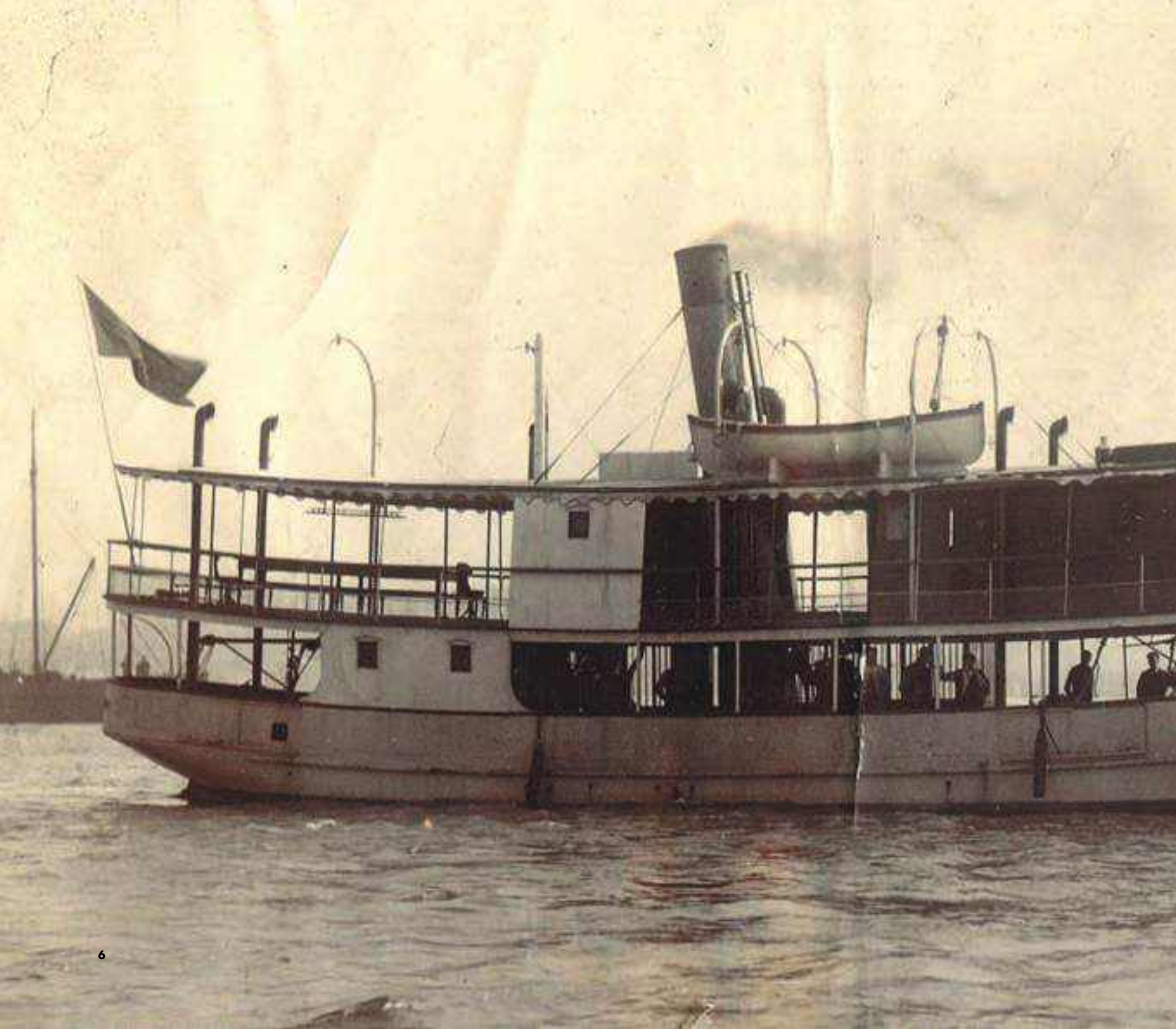
The Resurgam

Built by Cochran at Birkenhead, The Resurgam is widely recognised as the world's first powered submarine. The cigar shaped vessel was 45 feet long, 10 feet in diameter and weighed in at 30 tons. She was powered by a fireless steam engine designed by American Engineer Eugene Lamb. It was operated by a crew of three and was to be armed with the recently developed Fish torpedo. Completed in 1879 at a cost of £1,538, records show that early trials went well, with The Resurgam achieving a dive time of around 3 hours.

After successfully completing trials in the East Float at Wallasey, the vessel was to be presented to the Royal Navy in Portsmouth. Cochran wanted to transport the submarine by land, but Garrett insisted that the as yet not fully proven Resurgam was to make the long voyage round the coast under her own steam. However, during the voyage mechanical problems forced them to dock at Rhyl for repairs, it was then decided that the vessel would be towed to Portsmouth by the steam yacht Elfin.

They set sail on the evening of 24 February 1880, but within hours the Elfin developed engine problems and the Resurgam crew transferred over to assist. This threw up a key design fault for the Resurgam, whose entry hatch could not be secured from the outside. She began to ship water in the heavy swell, the tow rope broke under the added weight, the Resurgam sank in Liverpool Bay of Rhyl on the 25 February 1880.

The historic vessel was rediscovered in 1995 when she was snagged in the nets of a Colwyn Bay trawler. A local diver freed the nets, but quickly realised he had found the long lost wreck of the world's first steam powered submarine.



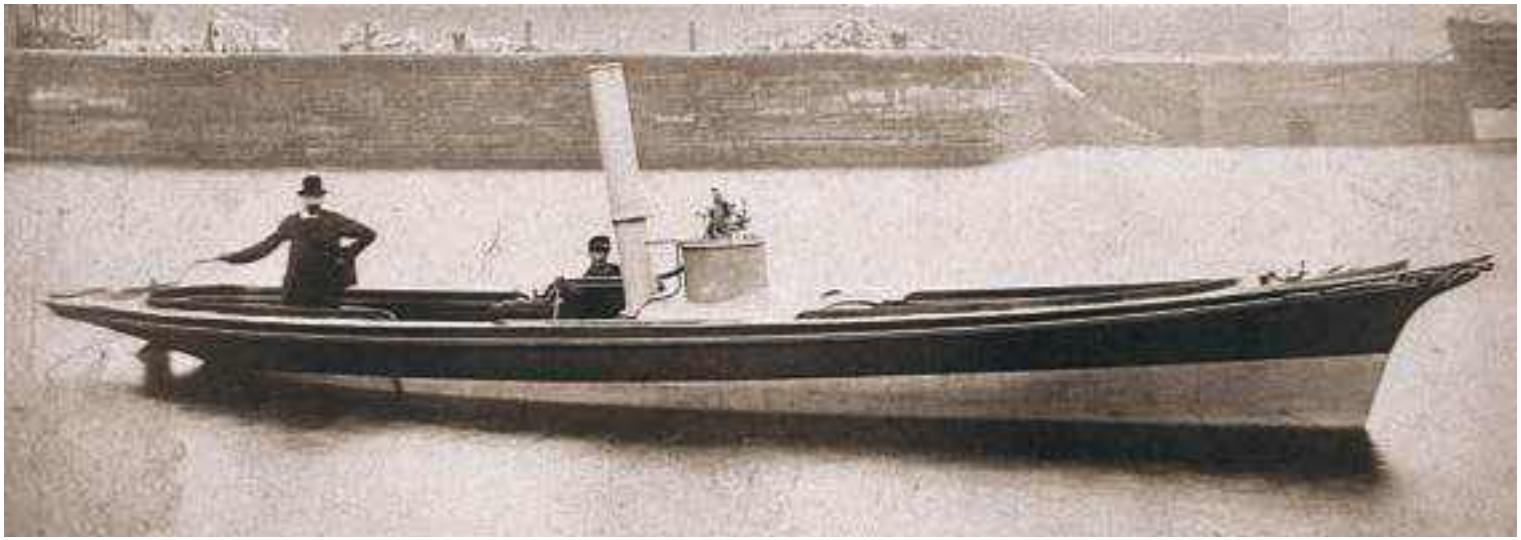
The meteoric success of the boiler meant that, by the mid-1880s, no fewer than four eminent engineering firms were manufacturing the Crompton design under licence in the UK. Even at this early-stage Cochran had established agents around the globe in India, Spain, Jamaica, Hungary, Egypt, Argentina, Holland, India, New Zealand and South Africa. An advert from 1887 shows the range of boiler outputs extended from 2 HP up to 60 HP, with all 21 sizes either in stock or under construction.

Alongside boiler production, shipbuilding and engine building, demand for Cochran's engineering was high, with one unusual, somewhat gruesome project being the first British designed and manufactured crematorium carriage, undertaken for the Anfield Crematorium in Liverpool.

The increasing success of the company saw numerous special engine configurations added to the product range. A commodious foundry was added to the factory to supply parts for engine and boiler work. As time went on, Cochran developed a first class reputation with numerous Port of Liverpool shipping companies for repair and refurbishment of their vessels.

In fact, Cochran were the first British company to build light draft stern wheel steamers, many used to transport rubber on the rivers of Bolivia. Cochran had almost exclusive business supplying these vessels in South America. One steamer, 'The Explorer' had a draft of just 6 inches. Fitted with a Cochran boiler, it was employed in navigating the upper reaches of the Amazon. In around 1894 she ascended these largely uncharted waters further than any steamship had done to-date.

Opposite: The Correio Tocantino, a typical Cochran-built River Steamer



A New Home

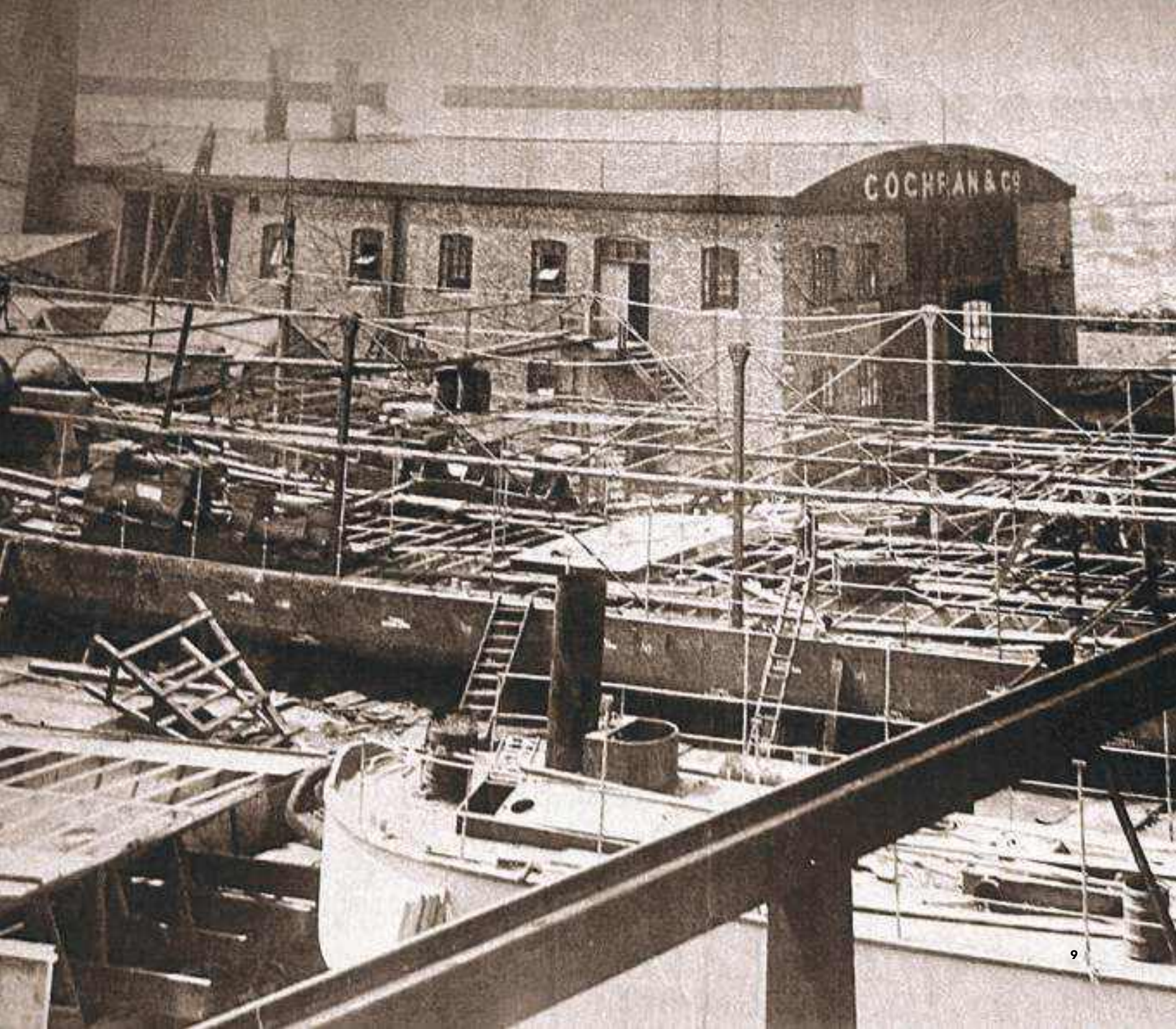
Cochran & Co. was in the unique position of not only being able to supply the steam plant for the vessels it was building, but also the design and manufacture of both single and twin-screw engines for them - giving the company the special advantage of delivering the complete ship. Used extensively on small steamers, tugs and fishing boats, some 2000 vertical Cochran boilers were manufactured in those first 20 years alone.

However, the company's continued expansion posed a real problem for the business. With growing repeat orders and the ever-increasing demand for Cochran products from new customers, it was becoming difficult to continue manufacturing at the Birkenhead site. The old site had no room to expand, so the Directors started the search for a spacious new location to enable company growth.

The historic decision was now taken to move North.

The relocation of the business to Newbie on the banks of the river Annan, well over 100 miles north of its old Birkenhead home, was a bold and courageous step. On the 13 February 1898, Cochran & Co. Annan Limited was registered with its main purpose being "to acquire and take over as a going concern and carry on the business of engineers and boilermakers now carried on by James Taylor Cochran and Edward Compton at Birkenhead, also the general business of engineers, boilermakers and builders of small craft, plus other similar machinery activities including boat building".

Above: An elegant Cochran-built Steam Yacht, circa 1890
Opposite: Cochran's cramped original site at Birkenhead


COCHRAN & Co

Newbie offered a prime site with ample room for expansion and close access to the nearby Solway Firth via the river. With deep channels, the Annan was ideal to continue shipbuilding along with boiler manufacture. The first sod was cut in March 1898, with production starting just over a year later in the summer of 1899.

The company not only erected a new factory on the 52 acre riverside site, but also houses nearby for workers. These homes formed the nucleus of what rapidly became a prosperous little community, that saw the establishment of a Co-operative Society which was connected to a Co-operative Women's Guild and Library. To ease workers' travel to the site from Annan and the surrounding area, arrangements were made with the Glasgow & South Western Railway for a train service morning and evening.

Newbie was such an extensive site that its own railway was built to carry material and products between the workshops. 'Blinking Bess', a much-loved diesel-powered locomotive built by Ruston and Hornsby, hauled loads around the site. Bess still exists, housed at the Scottish Industrial Centre near Dalmellington in Ayrshire.

Despite the relocation of the shipbuilding, engine and boiler making activities to Annan, Cochran & Co. retained an engineering repair and casting facility at their Duke Street works in Birkenhead. Announcing in a local newspaper the relocation of the business to Annan, an advertisement at the time described the Newbie facility as a "New Modern Boiler Factory in Annan" whilst "Patent Vertical Multi-tubular Boilers were always in stock or Progress".

With Cochran's already famous quality and reliability to the fore, Mr Austin, an independent surveyor from Lloyd's Register of Shipping first visited on the 30 June 1899. The first Annan-built Cochran boiler, number 2539, was tested on 6 October 1899.

In the early years, shipbuilding continued alongside boiler making, with some twenty vessels being launched and completed, with more than half destined for Africa and South America. However, in 1901 the shipyard was closed, enabling Cochran to concentrate on the manufacture of boilers.

In 1902 Cochran and Crompton retired from the board and the business was reorganised in 1904. Harry Llewelyn Davies became Chairman and Managing Director. The other members of the Board were John Bell and Charles Edward Crompton, son of Edward who invented the Cochran vertical boiler. Llewelyn would serve until 1923 and Charles Crompton until 1939.

For the next 20 years, Cochran continued to build on its boilermaking foundation; particularly in the shipping industry where the Cochran boiler became firmly established as the 'Donkey' boiler for lifting gear and winches on cargo vessels. The demand from both the land and marine markets was vast, with orders now coming in from every part of the world.

Opposite: Cochran's traction engine 'Bess' delivering one of three boilers to Nottingham Co-operative society from John Thompson (Wilson Boilers) Ltd. of Glasgow, supported by a pair of the 'new' diesel heavy goods vehicles hauling the second and third boilers

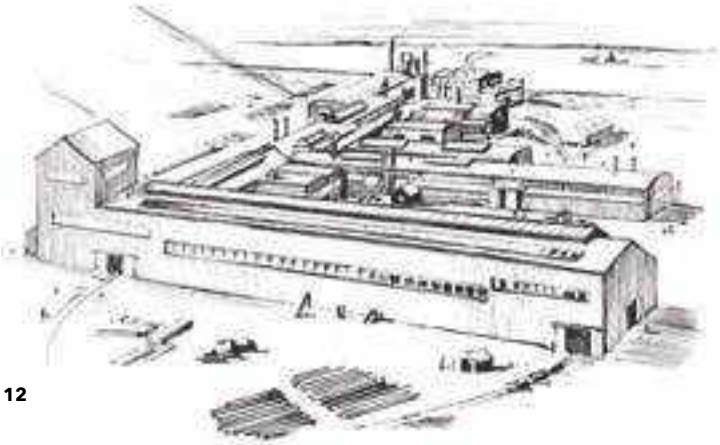
N & Co
GA7818

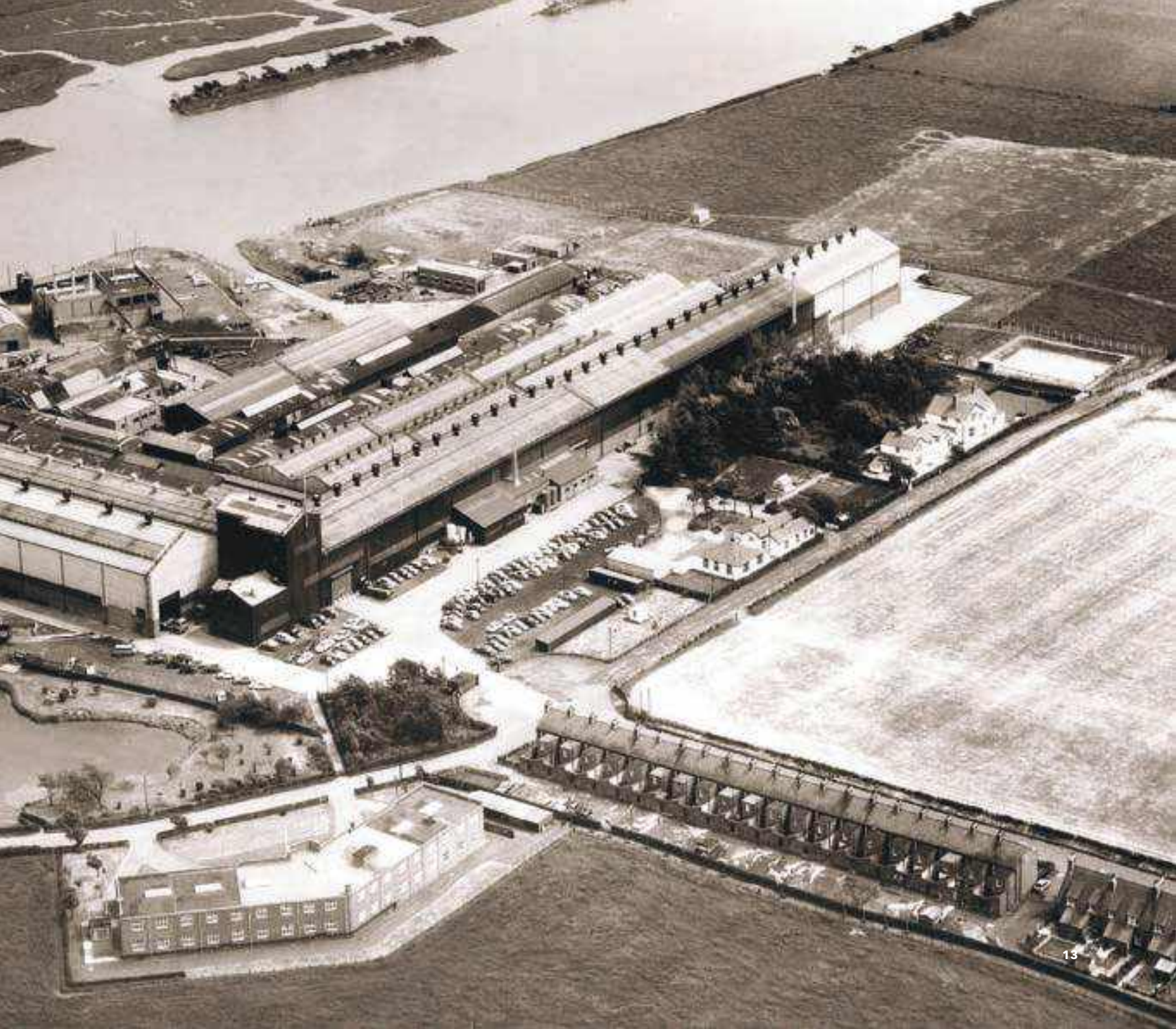
The Newbie Facility

Cochran's relocation to Newbie on the banks of the river Annan was a courageous step. On the 13th of February 1898, Cochran & Co. Annan Limited was registered with its main purpose being; "to acquire and take over as a going concern and carry on the business of engineers and boiler makers now carried on by James Taylor Cochran and Edward Compton at Birkenhead, also the general business of engineers, boiler makers and builders of small craft plus other similar machinery activities including boat building".

This was a prime site with room for expansion and access to open sea via the Solway Firth. The Annan's deep channel made it ideal to continue shipbuilding along with boiler manufacture. Ground was brken on the site in March 1898, with production commencing in just over a year in the summer of 1899. The company not only erected a new factory on the 52-acre site, but also built nearby workers homes forming the nucleus of what rapidly became a prosperous little community, as evidenced by the establishment of a Co-operative Society which was connected a Co-operative Women's Guild and Library. To ease travel to the works from Annan and the surrounding area as special Glasgow & South Western Railway service operated morning and evening.

Such was the size of the site at Newbie that a railway system carried material and products between the workshops, hauled by a Ruston and Hornsby diesel locomotive built by and named 'Blinking Bess' hauled loads around the site. Blinking Bess is today preserved at the Scottish Industrial Centre near Dalmellington in Ayrshire.





The Great War and the First Works Council

In 1913, the company undertook the first special oil firing trials to ensure optimum performance for use in steam raising. Cochran carried out tests on a wide variety of other fuels, adapting the boiler to burn virtually anything including coal, coke, wood, waste gas and bagasse, the refuse from cane sugar production.

Whilst the vertical boiler was the mainstay of the range, Cochran also manufactured horizontal steam boilers, such as the twin furnace 'Lancashire' and single furnace 'Cornish' boiler. Those groundbreaking designs were subsequently followed by both two and three pass 'Economic' boilers and triple, and even quadruple furnace boilers.

At the onset of the First World War, all production was taken under the control of the British Admiralty, with the entire workforce being classed as 'essential to the war effort'. They were issued with supporting paperwork and a lapel badge.

As the war moved into its second year, the numbers of volunteers and conscripts fell short of requirements and despite their key workers status, 137 Cochran men volunteered to serve in the armed forces.

During the war years, boilers produced were put to a wide range of uses, with many installed in boom defence vessels guarding harbours around Britain's coastline.

At the close of war in 1919 a joint letter was sent from the workforce to the Directors, it read "The successful termination of the Great War and the demobilisation of the army and navy, together with the ratification of the peace treaty of Paris has brought in their train many grave industrial problems, much industrial unrest and the unsettlement of pre-war labour conditions that call for wise and statesman-like consideration and solution as between Employers and Employed".

The letter continued "In sympathy with the prevailing unrest, the employees of Messer Cochran and Co Annan have made certain claims for shorter hours of labour and higher wages consistent with the rising ideals for improved labour conditions which the heroism and self-sacrifice of the soldiers throughout the war have made it now that they have returned to civil life very difficult, indeed impossible to withstand".

The Management responded "With a view to meet in a sympathetic spirit to these legitimate aspirations, the company has instituted a works Industrial Council. Wherein the human touch as between the Employers and the Employed could be more readily established".

The original 1919 Cochran Industrial Council

The Workforce responded "We the employees of the firm hereby desire to express to Mr Llewelyn Davis our appreciation of these aforementioned friendly advances and desire to reciprocate".

If this was not the FIRST works council in Great Britain, it was certainly ONE of the first.

Thus, on 3 February 1919 the first Industrial Council meeting was held This consisted of 16 members appointed by the Directors and 27 members elected by ballot to represent the various groups of employees within the works. Championing the democratisation of company decision making, at the onset of the first meeting Mr W Renton announced to all "ABANDON RANK ALL WHO ENTER HERE".

THE COMPANY CONTINUED TO GO FROM STRENGTH-TO-STRENGTH IN THE INTER-WAR YEARS, WITH THE ORDER BOOK IN 1924 STANDING AT AN EXTREMELY IMPRESSIVE 1200 BOILERS, EQUIVALENT TO AROUND THREE YEARS' PRODUCTION FOR THE 700 STRONG WORKFORCE. WITH THAT SOLID BUSINESS GROUNDING, COCHRAN EMBARKED ON NEW TECHNOLOGIES AND INCREASING ITS PRODUCT OFFERING.

Steam Accumulators and Pressure Vessels

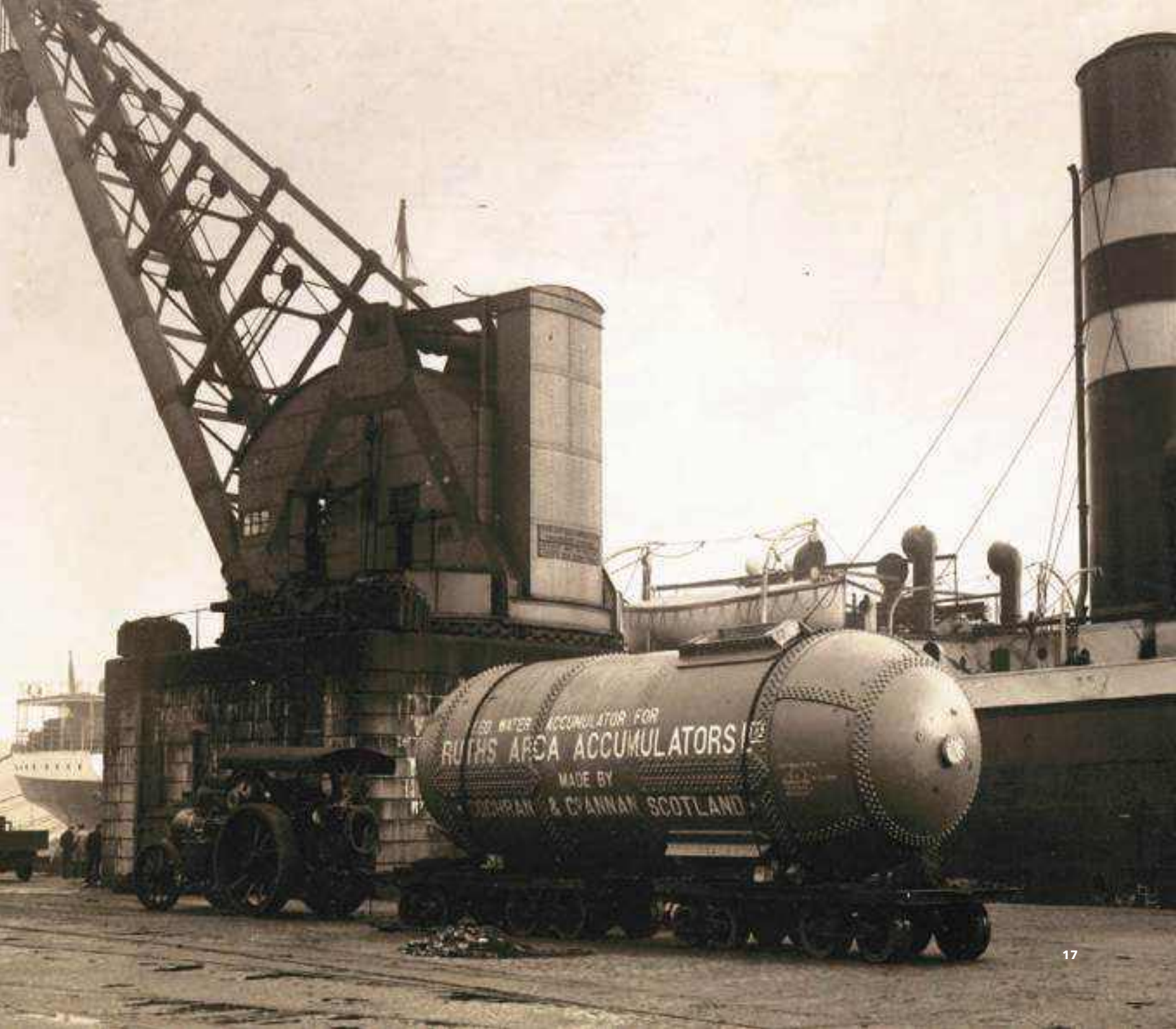
It was in 1928 that pressure vessel manufacturing at Newbie really took off. Their development by Cochran was in response to a rapidly growing market requirement for steam accumulators, the largest of which measured 75 ft long and over 11 ft in diameter. From these beginnings Cochran developed into one of the country's leading manufacturers of pressure vessels for the petroleum, concrete and papermaking industries.

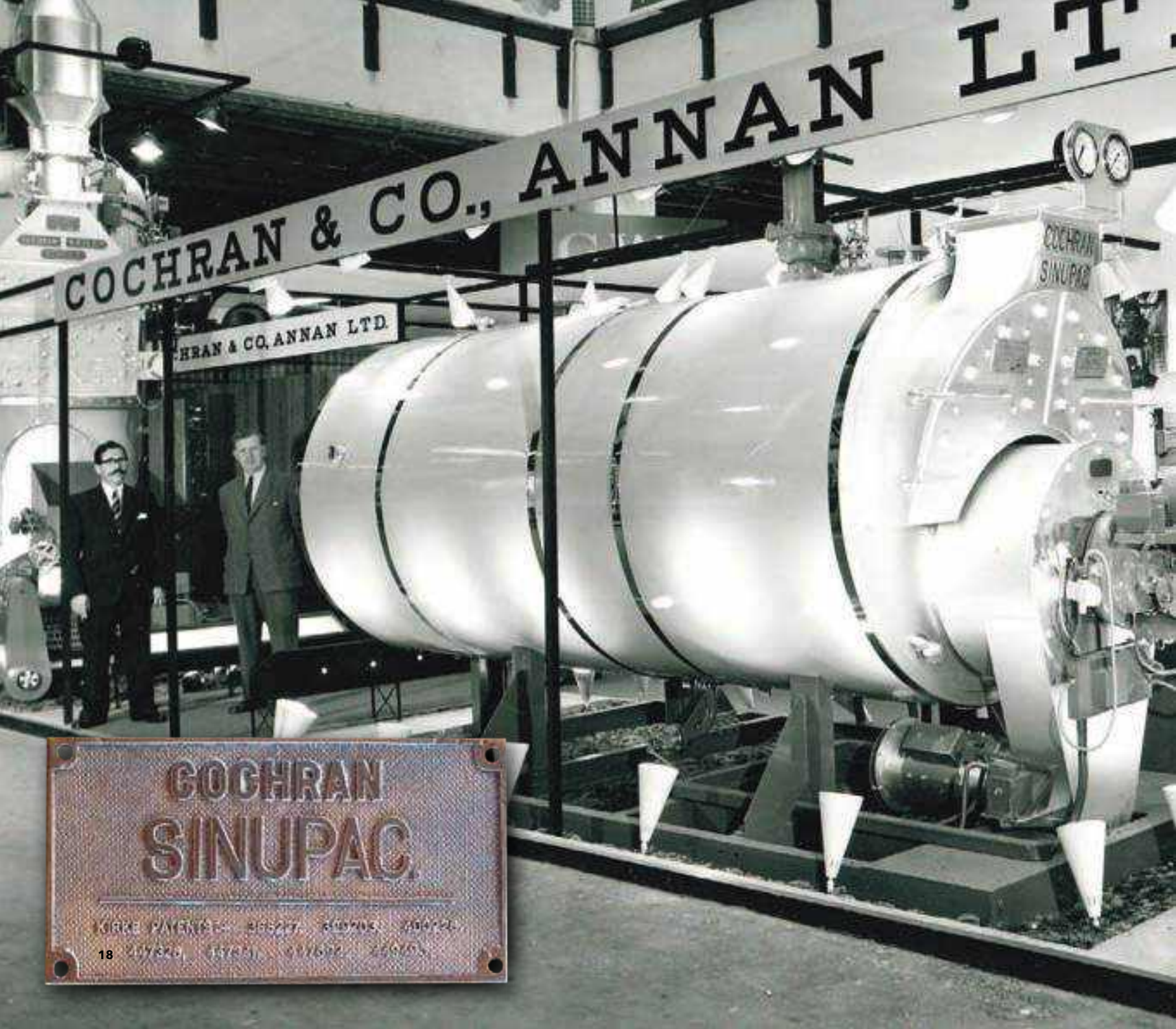
Steam accumulators are used to store energy at times of surplus for release at a later time when there is demand for it. These were generally used in applications where the steam demand may have sudden peaks with high instantaneous flows rates, due to the requirements of a process.

The largest vessels could weigh up to 100 tons, and such was their size that the Annan slipway had to be used to float them down the River Annan to the nearby Solway where they were towed to their eventual destination. A series of particularly large units were built for the Petro-chemical complex which was being developed by BP at Grangemouth.

However, the global depression of 1930 saw a real downturn in orders. In order to avoid large numbers of redundancies across the business, potentially leading to unrecoverable damage and throwing many valued employees into poverty at a time of mass unemployment, from November 1930 to June 1931 ALL employees - including the Directors - agreed to receive 75% of their pay or salary.

Rumours of a secret workforce of small children at Cochran are wholly untrue!


ACCUMULATOR FOR
RUTHS AFSA ACCUMULATORS
MADE BY
& Co ANNAN SCOTLAND


COCHRAN & CO., ANNAN LT
COCHRAN & CO. ANNAN LTD.
COCHRAN
SINUPAC
COCHRAN
SINUPAC

New Products and Technology of the 30s and 40s

Until the invention and patenting of the 'Sinuflo' steam tube by Percy St George Kirke, boilers remained fundamentally inefficient. Taking their name from their sinuous form, the new tube was a game changer; allowing hot boiler gases to swirl against the inner surface of the tubes along their whole length; resulting in most of the heat passing into the water, maximising efficiency.

In 1934, Cochran reached a licencing agreement with Kirke and a range of horizontal waste heat and fossil fuel fired shell boilers was launched. These new boilers were very successful, proving ideal for raising steam from the residual hot gases in gas and steel works.

'Sinuflo' Horizontal Economic Boiler: *In 1934 the 'Sinuflo' boiler was introduced. Aimed at customers who required steam between 7,200 and 37,000 lbs/hr (3,266 to 16,788 kg/hr) from a single furnace boiler, they were praised in the journals of the time as "a fine horse from the best stable". Use of Sinuflo tubes achieved a heat transfer rate of a standard tube more than twice their length, delivering thermal efficiency that was outstanding for the time.*

'Sinupac' Horizontal Economic Boiler: *The benchmark thermal efficiency of the Sinuflo tube meant that it was later incorporated in all the company's boilers; both vertical and horizontal. The Cochran 'Sinupac' Economic boiler was launched in 1940. With an induced draught fan, large combustion chamber and exceptional internal accessibility, the Sinupac marked a step change in boiler design; with the largest units producing 25,000 lbs/hr (11,340 kg) of steam at up to 250 psi (17.2 BarG). Indeed, such was this design's popularity that it was still operating efficiently into the 1950s.*

The Inter-War Years and Beyond

Even during the depression of the early 1930s, the courageous decision was taken to extend the Newbie works; a bold policy of expansion that continued throughout the 1930s and 40s.

The original factory buildings, which were for the most part constructed of timber, had served the company very well. However, immediately after the 1914-18 War, an additional press shop was built; the office building was enlarged in 1926 and in 1930; the works were further extended with a large steel-framed shop ,including the riveting tower all designed to handle heavy vessels up to 75 feet (22.8m) in length. This was the top end of what is today known a 'Bay 7'. Further extensions were made to the light plating shop in 1937 and press shop in 1938; the latter now incorporating a huge 1500 ton press.

At the outbreak of the Second World War, existing Cochran policy was to supply boilers from stock, so the company was able to meet the surge in demand. Between 1939 and 1945 the company supplied thousands of heating boilers for a variety of wartime needs, notably for the numerous new barracks and training camps that were established for the war effort.

Alongside this more 'traditional' Cochran work, the company also became a key armaments manufacturer; producing high quality plate armour for tanks and as war's end approached, it was also responsible for constructing several of the huge caissons used to build the famous Mulberry Harbour that played such a vital role in the D-Day landings in 1944, during the first critical stage of the Allies' invasion of France.

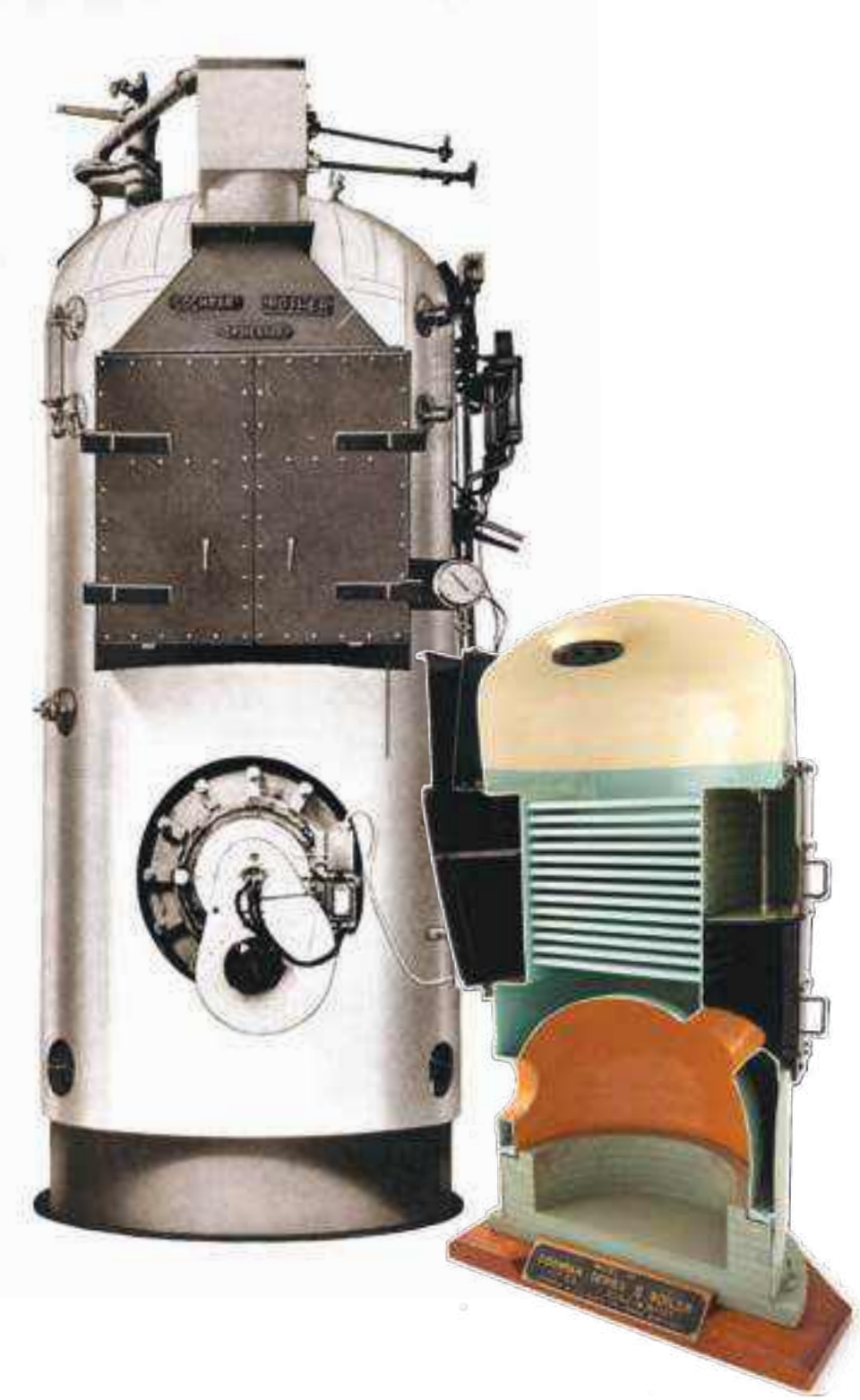
During the war, improvements continued; new offices were built in 1942 and a works canteen was launched. A new machine shop and loading bank were then added in 1945, enabling the stores to extend into a redundant old engine shop.

In 1948, a stress relieving furnace was built for dealing with vessels up to 14 feet (4.2m) in diameter and 25 feet (7.6m) in length. During the summer of 1949 the 'Heavy Shop' that had been constructed in 1930 also underwent a considerable extension.

Cochran has always driven hard to produce highly efficient boilers of sound design and construction; boilers that combine the highest standards of workmanship with the most up-to-date methods of manufacture. Fusion Arc Welding, which had already been used at the Newbie Works for around 10 years, was officially recognised by Lloyds Register of Shipping and added to their list of approved techniques for the manufacture of Class 1 Welded Vessels in 1946.

From the end of the war until the early 1960s, the main product which emerged from the works at Newbie continued to be vertical boilers for land and marine use. Further efficiency improvements were gradually being introduced; with welding having, by then, completely replaced traditional riveted boiler construction and heavy oil firing becoming the norm in place of coal.

Embracing the need for greater efficiency, the company introduced two boiler models that were widely acclaimed as ahead of their time.



Cochran 'Series II' Boiler (below left): *As the country's industry was rebuilding after the War, research and development was vital to meet the demands for greater efficiency from both government and industry. Launched in 1959, Cochran's 'Series II' vertical boiler met all the key criteria. The 'Series II' offered groundbreaking thermal efficiency of over 80%. It delivered outputs greater than a standard Cochran boiler of the same shell diameter, featured fully automated operation, was delivered as a complete working unit AND was capable firing oils, or solid fuel.*

Series II outputs ranged from 1750 lbs/hr to 10,000 lb/hr (794 kg/hr to 4500 kg/hr). Large numbers were sold, with the majority featuring the welded construction that had become the standard method of construction by 1960.

Cochran 'Spheroid' Boiler (far left): *The 'Spheroid' Packaged Vertical Boiler was released in 1964, it superseded the 'Series II' boiler which finally ceased production in 1966. It was, of course of an all-welded construction and was, in effect a modern version of Cochran 's original 1878 vertical boiler. The name was derived from the spherical furnace which delivered higher steam outputs due to its larger radiant heating surface. Benefitting from the use of turbulators in the tubes, thermal efficiency now exceeded 80%.*

The Spheroid was now not only smaller and lighter, but also commanded a lower capital cost than its competitors. It was supplied as a fully automatic package and available with steam outputs as high as 11,500 lbs/hr (5216 kg/hr).

Initially aimed at the marine market, it was later adopted for land use. A highly successful production run saw the last Spheroid manufactured in 1975; a 4-foot 6-inch (1370mm) diameter boiler destined for use in a ship in Hong Kong.

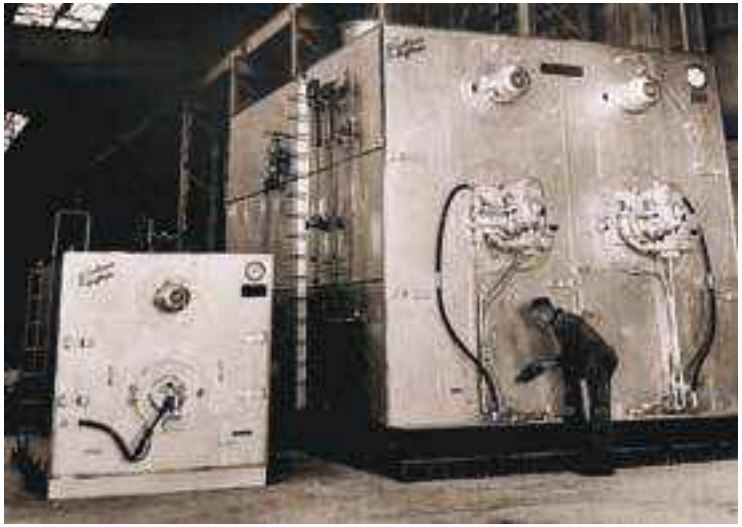
COCHRAN
CHIEFTAIN
BOILER
FOR
PRESSED STEEL Co.,
COWLEY
OXFORDSHIRE
PICKFORDS
UXC

THE 'PACKAGED' BOILER WAS INTRODUCED IN THE 1950S; A REVOLUTIONARY CONCEPT INITIALLY DEVELOPED IN AMERICA. THE UK MARKET WAS ATTRACTED TO THIS NEW SIMPLIFIED APPROACH, BUT REQUIRED THE REASSURANCE OF SOME ADDITIONAL BRITISH FEATURES, WITH MORE CONSERVATIVE DESIGNS AND WATER COOLED ('WET BACK') REVERSAL CHAMBERS. IN 1956, BS 2790 WAS INTRODUCED FOR CYLINDRICAL BOILERS OF WELDED CONSTRUCTION. HOWEVER IT WASN'T UNTIL THE EARLY 1960S THAT A NEW RANGE OF HORIZONTAL PACKAGED BOILERS WERE DEVELOPED BY COCHRAN, WITH LAUNCH OF THE ICONIC 'CHIEFTAIN' RANGE.

Cochran 'Chieftain' Boiler: *Cochran's first horizontal packaged boilers were the 'Chieftain' and its little brother, the 'Wee Chieftain'. Launched as early as 1963, the 'Chieftain's name was suggested by employees, setting a trend of solid Scottish names for new Cochran boilers. Oil and gas burners could be fitted across the ranges and, though initially developed to produce steam, high pressure hot water versions were soon also manufactured. The range was an instant success with customers, and remained a market-leader for many years. The single furnace 'Chieftain' boiler was supplied in outputs up to 21,000 lb/hr (9,528 kg/hr), with the twin furnace version capable of producing steam up to 42,000 lb/hr (19,056 kg/hr). The 'Wee Chieftain' range covered 1,500 to 4500 lbs/hr (680 to 2041 kg/hr).*

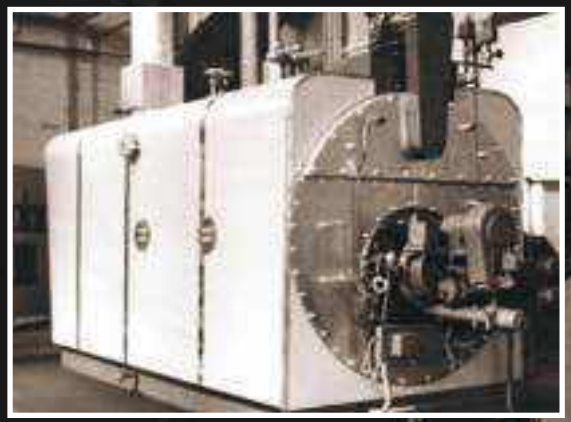
Cochran 'Clansman' Boiler: *In 1966 Cochran launched a new hot water boiler range. Known as the 'Clansman', it was a result of several years of careful and continuous development. There were eleven sizes in the range, delivering from 650 to 7300 kw. For larger requirements, the 'Chieftain's' high output version provided up to 29,300 kw of hot water. The Clansman incorporated a water cooled hemispherical rear chamber and tubeplate. A popular feature of the time, it was immensely strong and allowed use of a large furnace area, ensuring a low backend temperature.*

Later Cochran Boilers: *The range of boilers Cochran were able to offer were of course strengthened in the following years by sister products like the 'Thermax', 'Multipac' and 'Minipac', as well as by the introduction of reverse flame design boilers in the 80s - but it was the 60s that really established the new era of horizontal packaged boilers.*



Above: Flexibility with a range from 700 kg/hr to the19,000 kg/hr with twin furnace design

Opposite: A large Chieftain unit bound for the Pressed Steel vehicle panel makers at Cowley



Above: The first ever Chieftain on test in Cochran R&D in 1963.
Main picture: The Chieftain dwarfs its little brother, The Wee Chieftain.

The Great Fire of 1975

In July 1975, during the company's three-week summer shutdown, maintenance work was being carried out on the roofs of some of the older wooden shops. A fire broke out which quickly got out of control, this resulted in the loss of a substantial manufacturing and storage area... Luckily no one was injured.

Three shops which carried out pressure part assembly were affected. The loss was substantial with costly eight overhead cranes, four Submerged Arc welding stations, the main set of plate rolls and 500 ton press rendered U/S - plus all of the associated equipment and tools.

There was also the loss of many boiler parts in the process of manufacture. Many felt that this was 'the end' for Cochran, nevertheless the group made the decision to rebuild once the affected areas had been cleared and made safe. Equipment was hired and production commenced again within weeks.

Drawing on the extensive internal fabrication capability and extensive resources of the company, new shops and equipment were in place and operational within the year.

Acquisitions and Mergers

Whilst Cochran have occupied the site at Newbie since 1898, 'Cochran Ltd' now also incorporates the histories and traditions of three other leading UK boilermaking companies; John Thompson (Wilson Boilers) Ltd. of Glasgow; Ruston Boilers of Lincoln; and Beel Industrial Boilers of Lincoln.

In 1968 Cochran acquired the Lincoln boilermaker 'Ruston and Hornsby' who produced a range of shell boilers under the 'Thermax' brand name.

'Clarke Chapman Ltd' of Tyneside merged with the 'John Thompson Group' to form a much larger diversified engineering group baring the name 'Clarke-Chapman John Thompson Ltd'. The Glasgow boiler company became known as 'John Thompson (Shell Boiler) Division'. Since the 'John Thompson Group' were well known manufacturers of high output water tube boilers for power generation, it was necessary to differentiate the two businesses, hence the 'Shell Boiler' designation in the title of the Glasgow business.

In 1969 Cochran itself was purchased by John Thompson, trading under the newly formed 'John Thompson Cochran Group'. With manufacturing facilities at Lincoln, Glasgow and Annan, it was recognised at that time as Europe's number one shell boilermaker. However, the oil crises of the early 70s intervened and re-shaped the market for industrial shell boilers, with the result that in 1972 the Lincoln works of 'Ruston and Hornsby' closed.

Manufacture of the popular 'Thermax' model then transferred to Annan, alongside the well established 'Chieftain' boiler, whilst the Glasgow factory concentrated on the production of the 'Multipac' boiler. Both the 'Thermax' and the 'Multipac' matched the evaporation range of the 'Chieftain', but offered the advantage of being less expensive to manufacture due to the simpler cylindrical, reversal chamber design. This resulted in phasing out the original 'Chieftain' over the course of the 70s. The 'Multipac' then largely fell by the wayside in the 80s, as it featured a deep, complex front smoke box that was a more expensive to produce than that of the 'Thermax' design.

By Appointment to
Her Majesty The Queen
Boilermakers
Cochran Ltd, Annan.

Into the Modern Era

In 1974 Cochran was awarded the highly prestigious 'Queen's Royal Warrant' as a supplier of after-market service work associated with the boiler plant located at a number of the Royal Households. This greatest of British accolades is given to only one UK business within a sector at any one time, marking out Cochran as 'the best of the best' in the eyes of the highest judge in the land.

Unfortunately in 1982, following the collapse and closure of the hugely important Iranian market brought about by the effects of the Islamic Revolution, the Carntyne works in Glasgow became redundant. Newbie was now more than capable of meeting both the UK and export market needs, and was deemed to be a lower cost facility. Annan's working foundry was pivotal in the decision to close the Glasgow factory 1982. A number of the Glasgow staff transferred to Annan where the businesses' engineering, sales and marketing functions were successfully merged.

By 1977, 'Clarke Chapman' had dropped the 'John Thompson' element from their name and merged with Tyneside-based electrical engineering company 'Reyolle-Parsons'. The resulting 'Northern Engineering Industries plc (NEI)' operated the 'Thompson Cochran' division as a standalone business within the new group, entitled 'NEI Cochran Ltd'.

Further change came about in 1982 when NEI Cochran Ltd was absorbed into the Derby-based, 'NEI International Combustion Ltd'. They were a 'reluctant' parent whose core business was supplying water tube boilers for the UK's main power generation provider the Central Electricity Generating Board (CEGB).

The working practices of the parent company were, at times, directly at odds with that of the fast industrial shell boiler market inhabited by Cochran... Not an ideal situation for the company.

In 1989 came the welcome announcement that NEI and the Derby-based 'Rolls-Royce Plc' would merge to form the 'Rolls-Royce Industrial Power Group'. By merging the power engineering and project management capability of NEI with the financial muscle of engineering giant, Rolls-Royce and its turbine engine technology, the new group could deliver complete power station packages.

With much relief, Cochran were now freed of the limitations of NEI, with the result that the company was now simply a business unit within the Rolls-Royce Industrial Power Group. Having the strength, resources and status of the Rolls-Royce brand behind the Cochran name was of huge benefit, especially in important overseas markets, such as China. Though largely an autonomous business, if Rolls-Royce's caché helped to advance sales of Cochran products, there was little need to break that illusion!

Cochran Combustion Equipment

Drawing on its unrivalled track record of boilermaking know-how, Cochran moved into the development and manufacture of combustion equipment as early as the late 1950s; with firing performance matching the efficiency and reliability of its world famous boilers. The ability to offer a complete boiler package, including the combustion equipment was an attractive prospect, and as early as the mid-60s a dedicated burner design team was established and led by Engineering Manager, Gordon Myatt.

The first fruits of the design team was the introduction of the Mk I 'Simplex' High/Low Pressure Jet Oil Burner for steam and hot water boilers. This was soon followed by the more technically sophisticated and fully Modulating Split Stream Spillback burner for higher boiler ratings of up to 10,000 lbs/hr (4,500 kg/hr).

Ongoing R&D work led to the introduction of the 'Triplex' pressure jet oil burner in 1996. This burner featured operating modes in the high/mid/low ranges joining the already established range of Cochran light and heavy oil, natural gas, town gas and LPG burners. Dual fuel versions capable of firing on oil or gas were also made available.

By the late 90s Cochran had become widely recognised as an important global manufacturer of combustion equipment, also opening up huge new after-market opportunities for the company's extensive spares and service business.

The latest UltraNOx Burner with flame inspection window

The original Mk 1 Burner

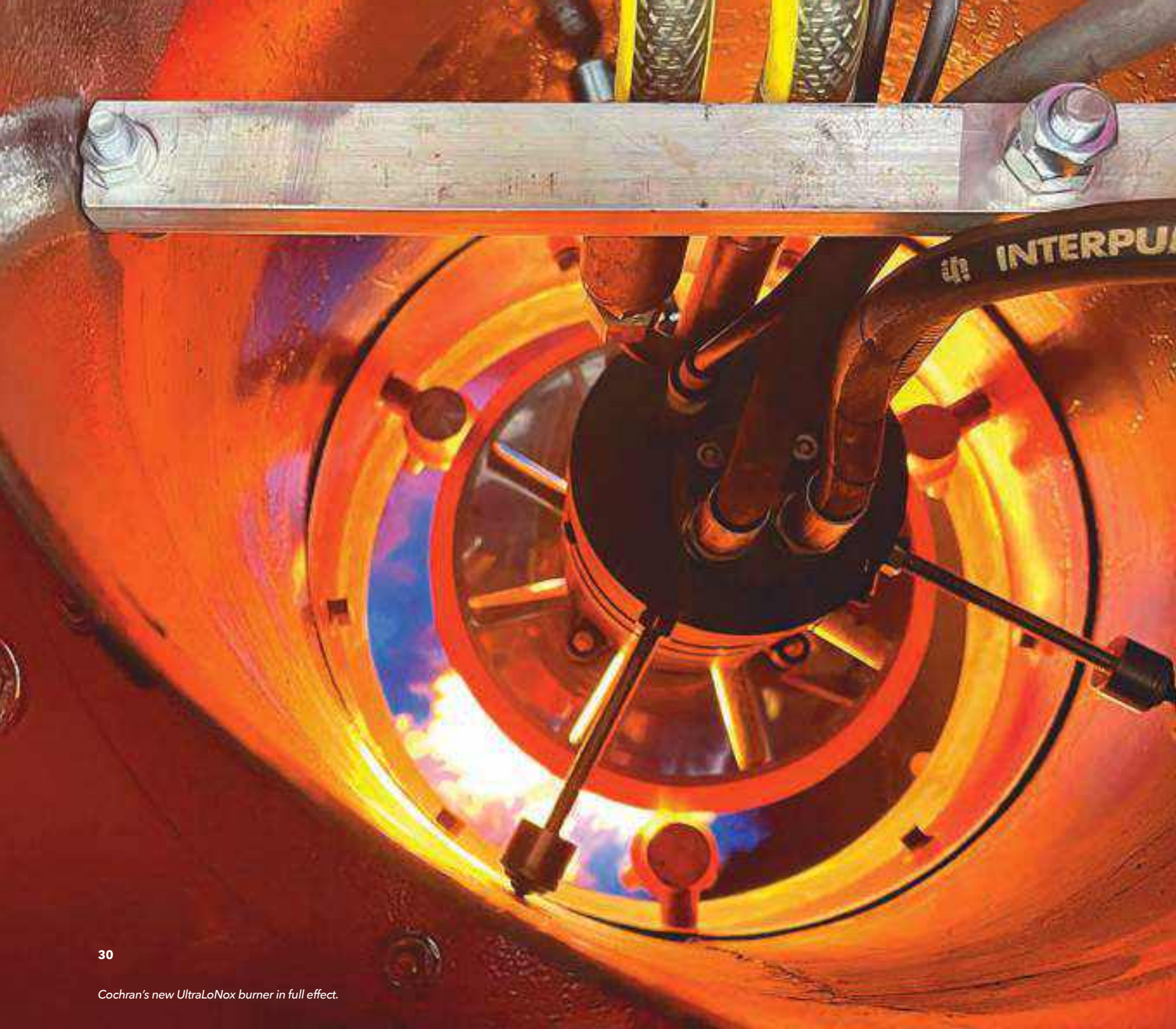
The popular Equinox Burner

UltraNOx Burner

As the new millennium arrived, the burner range was further extended with the 'Equinox', which was capable of meeting boiler outputs up to 35,000 lbs/hr (15,880 kg/hr). Up to that point, there had been a heavy reliance on third party burner manufacture at these higher outputs. Equinox really complimented the existing range, allowing Cochran to become largely self-reliant for firing technology.

It was then, with the introduction of the Medium Combustion Plant Directive (MCPD) in 2018, substantially limiting emissions on new boiler plants, that the company seized the opportunity to further develop its combustion range with the 2020 launch of the 'UltraNOx' burner.

The 'UltraNOx' and its latest iteration, the 'UltraLoNOx', have proven to far exceed the stringent limits set by the MCPD. Achieving Nitrous Oxide (NOx) levels of 30mg/Nm^3 when firing natural gas. Suitable for boilers rated up to 24,000 kg/hr, it places Cochran firing technology right at the forefront of modern burner design and performance.



Cochran's new UltraLoNox burner in full effect.

Three ST36s at work in Qatar

Five Clansmen in Dubai

The Importance of Export

From those early days when Cochran & Co were first exporting to all corners of the world, there was the recognition of the huge potential an international marketplace offered business. With ever-increasing globalisation, this holds true today.

Important early markets were in the developing regions of the near East and South East Asian countries, who were anxious to develop their home grown industries where a reliable steam supply was essential. Further important markets opened up in the Middle East and Africa, whilst the first Cochran boiler to reach China was installed in the Customs House at Shanghai in 1934. Despite the loss of the key Iranian market, the Middle East continued to play an important role in developing the export business.

New markets were also found in South America and later in Eastern Europe. Many nations were developing their own dedicated quality and inspection standards; with compliance becoming mandatory.

Perhaps the most prestigious approval was gained in 1995, when Cochran became the first company in the world to be awarded the Chinese 'Safety Quality Licence'.

Since then, many hundreds of boilers have gone to China, with many high end customers, including airports, hospitals, chemical plants, power stations, the Chinese Mint and the Great Hall of the People in Beijing all relying on Cochran technology. Whilst pressure part construction is in the main undertaken in full accordance with both benchmark British and European standards, obtaining the additional approval of the American Society of Mechanical Engineers (ASME) has been an essential requirement of certain overseas markets.

Even today, Cochran's export business makes up around 30% of the overall business sales.

Sea Change in the New Millenium

Change was again on the Cochran horizon when, in 2000, Rolls Royce sold Cochran to BIB Group, part of the Malaysian-based Mechmar Corporation. At that time, Mechmar also owned Lincoln-based boiler manufacturer Beel Industrial Boilers, so the combined business became the largest manufacturer of shell boilers in the UK.

Both companies retained their own product range and continued to promote them; with the Lincoln factory latterly concentrating on the manufacture of pressure vessels, whilst boiler manufacture was consolidated in Annan. However, with the downturn in pressure vessel manufacture, the decision was taken to cease manufacture at Lincoln in 2004, with the factory finally being sold in 2008.

The Cochran story of course continues today, with the Annan-based company now owned by leading Hong Kong-based investor Mr Li following its acquisition in 2010. The new owner has brought stability and investment.

As a Strategic Investment, Mr Li has empowered the management team to make the changes needed to take the business forward with a commitment to invest in people, processes and new equipment. Investment in the factory was the first step.

The manufacturing processes were mapped and key areas for improvement identified. Since that review, heavy investment has seen a new high definition plasma cutting machine purchased; welding plants renewed and updated in line with introduction of new processes; and upgrades of heavy rolls; which in turn was followed with the replacement of several new cranes. Numerically Controlled machining centres were added in 2021, along with a dedicated powder coating bay to enhance product aesthetics and further improve burner and control panel build capability.

The investment has gone significantly beyond machine tools to encompass the fabric of the building and IT infrastructure. There has also been further commitment to Health and Safety, with ISO 45001 added to the long standing ISO 9001 quality management accreditation being put in place.

In 2019, Cochran made the bold decision to re-structure the business into two operating units, 'Cochran Ltd' which is responsible for the marketing, sales and manufacture of boiler, and 'Cochran Services Ltd' which compliments new boiler manufacture with life cycle support; offering up the provision of spare parts, after-market products and support, boiler servicing, hire and training. Both operating divisions sit within the parent 'Cochran Group Ltd' in a move that has reduced operating costs and promoted focus on the individual business centres.

Pictured: Mr Li (centre) and his personal advisors with the Cochran management team led by Andrew Velichansky and Managing Director, Tom Ritchie.

This coherent leadership, supported by the company's highly skilled and dedicated workforce has been a key factor in ensuring a bright future for Cochran; one with a strong global presence and technology at the forefront of innovation.

BAY I

The latest in cutting-edge technology; the Suprarex HD flatbed cutting unit and Vision T5 control unit are put through their paces at Cochran

Leading-Edge Technology

Recognising the importance of emerging intuitive touchscreen control in boilerhouses, Cochran launched its advanced 'Synergy' management system in 2014. Providing comprehensive control and monitoring of the complete boilerhouse with extensive remote features offering the potential to substantially reduce boilerhouse manning costs.

2020 saw the introduction of the 'Eclipse' control system, combining the key features of the ground-breaking 'Synergy' system with a compact 7 inch screen. The 'Eclipse' has been developed for operating smaller energy centres. However, many of the remote monitoring and operation features of its high tech brother are included, enabling similar cost-effective on-site reductions. Both systems offer state of the art operational control and monitoring.

Product Rationalisation

With the introduction of the Medium Combustion Plant Directive (MCPD) in 2018 that limited emission levels, the company took the opportunity to rationalise its complete product range. This was a tough decision to move away from the old product names such as 'Thermax' and 'Wee Chieftain' that had served the business so well over many years. It was with that rationalisation that the ST and HW designations were introduced across all products.

Old Range Title	New Specification
Wee Chieftain	ST23 / ST28
Thermax	ST36 / ST37
Borderer	ST25 / ST65
Clansman	HW29 / HW39
Thermax HW	HW31 / HW34
Waste Heat Steam	ST95
Composite Steam	ST49

The Covid Years

The tragic Covid years put enormous strain on global economies, marking the death knell of innumerable long-established British businesses. Nevertheless Cochran continued working, delivering six new boilers to hospitals and supporting the maintenance and repair needs of 72 key NHS sites.

ST37 or Thermax; despite their illustrious pedigree, the decision was taken to rename well known boilers like the Thermax and Wee Chieftain in 2018

Support Services: *The UK's largest team of maintenance, repair and service engineers*

Spares Division: *The UK's largest stock of all makes boiler spares and consumables*

Aftermarket: *Retrofitting a Cochran Economiser can offer a fuel saving of as much as 6%*

Training: *Specialist training, including CEA courses*

Support Services: *Breakdown cover 24/7/365*

Aftermarket: *Retrofitting the latest ultra-low emission burners*

The Total Package

Needless to say, though only formed as a separate entity in 2019, Cochran Services has already become known for the market leading performance of its products and services. Life cycle support is essential for any manufacturing business, and particularly with a complex product base like Cochran's. Of course, support services were already in existence within the business, but the introduction of the dedicated Cochran Services unit into the Group has really paved the way for the business model to move to the next level.

Support Services: *The service and breakdown team has always been vitally important to the Cochran offering, operating the UK's largest team of maintenance, repair and service engineers. Its highly experienced experts provide contracted servicing and emergency breakdown cover 24/7/365, ensuring all makes of boiler can be operated and peak efficiency and that any issues are dealt with rapidly AND cost-effectively.*

Training: *In today's highly regulated safety environment, with HSE and Insurance Companies requiring proof of competence, Cochran's training capability is leading the way in ensuring those responsible for day-to-day boilerhouse operation, or overall management are fully conversant with risks, safe procedures and best practice. Cochran offers a wide range of specialist boilerhouse training, and is today just one of a handful of organisations approved to deliver the Combustion Engineering Association's (CEA) highly respected accredited courses.*

Spares Division: *Cochran's spares division maintains the country's largest stock of specialist boilers spares and consumables and are official agents for several leading brands such as Siemens. This huge stockholding was further enhanced with an online service and dedicated spares website in 2012. www.cochran.co.uk/spares*

After Market: *The after market product offering has excelled since 2019, bringing added depth and value to Cochran Services' offering. When funding is limited, modernisation of existing plant is a very attractive option, so the ability to upgrade older boilers to exceed 95% nett efficiency, particularly with today's skyrocketing fuel costs, has been a game changer. Cochran Economisers offer a fuel saving of as much as 6% and have the added advantage, particularly in the retrofit market, of being designed as a standalone unit that can be fitted quickly and easily with the bare minimum of downtime. Combine this with a Cochran UltraNOx burner capable of achieving NOx emissions less than 30mg/Nm^3, and the carbon reduction delivered is extremely impressive. In fact, even simply retrofitting just the UltraNOx combustion head to existing burners can deliver significantly lower emissions at a greatly reduced lower cost.*

Hire Division: *Cochran's hire service has seen significant change and growth in recent years, with heavy investment in both compact containerised and highly manoeuvrable trailer options commencing in 2019. These units are now are provided with Cochran's 'Eclipse' touchscreen boiler control system complete with remote capability, providing customers with the peace of mind knowledge that Cochran Support Services are investigate any issues 24/7. This highly responsive solution with minimal upfront capital expenditure has made the Cochran Hire option ideal for modern, fast moving industries.*

Boiler Hire: *'Plug'n'play' containerised or trailer mounted short term energy solutions*

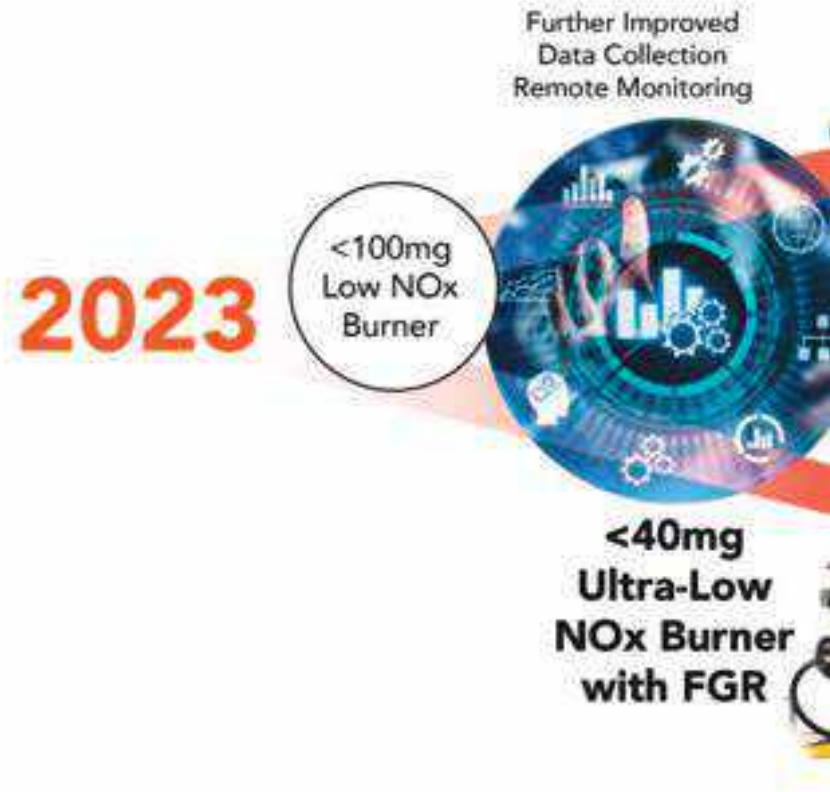
1898 2023 COCHRAN

The Decarbonisation Journey

Boilers leaving the Newbie factory today are fitted with the very latest in Cochran combustion equipment. Specially designed to minimise emissions of greenhouse gases, they are operated using the latest micro-processor and PLC controls, coupled with a highly intuitive user-friendly touchscreen interface. Many are now also delivered already fitted with efficiency boosting economisers, enabling them to deliver efficiency in excess of 95%, levels that Crompton could only have dreamed of back in 1878.

As worldwide attention becomes closely focused on the crucial need to reduce global emissions and develop ultra-low carbon technology, a wide variety of new fuel types are being considered. Here in the UK, Hydrogen is high on the list of attractive options, amongst other sustainable fuels like ammonia, syngas, biogas, HVO. Electrification of steam and hot water production is also firmly at the forefront of current thinking, though that electricity must of course be efficiently generated.

Cochran are making big strides in positioning ourselves at the forefront of energy generation decarbonisation through a variety of groundbreaking projects. One key area of research is in the design and manufacture of a Packaged Plantroom Test Facility containing a 5,000 kg/hr boiler. It is capable of being fired entirely by hydrogen which generates harmless water vapour when burned. With test results already very positive, this package is the first of its type in the UK and has set a benchmark in Cochran's commitment to embracing the need for low carbon technology.



2035
Cochran's Decarbonisation
H_2 Ready 80:20 Reduced Output to CH_4
Launch of Cochran Electric Boilers
Introduction of Supplementary Electric Elements for Boilers
100% CH_4 and H_2 Firing Off-Grid
Off-Grid Dual CH_4 and H_2 Firing at Same MCR Output
Cochran Solar Farm at Newbie
Thermal Storage of Off-Peak Power
Grid-Fed H_2 Firing

Just some of today's Cochran team; building on an illustrious history of quality, reliability and innovation to remain at the leading edge of energy generation technology. Behind them stands the new H2 testing rig. Burning 100% hydrogen, this new boiler fuel technology will play a crucial future role in the decarbonisation of energy generation.

COCHRAN

LOOKING TO A BRIGHT FUTURE

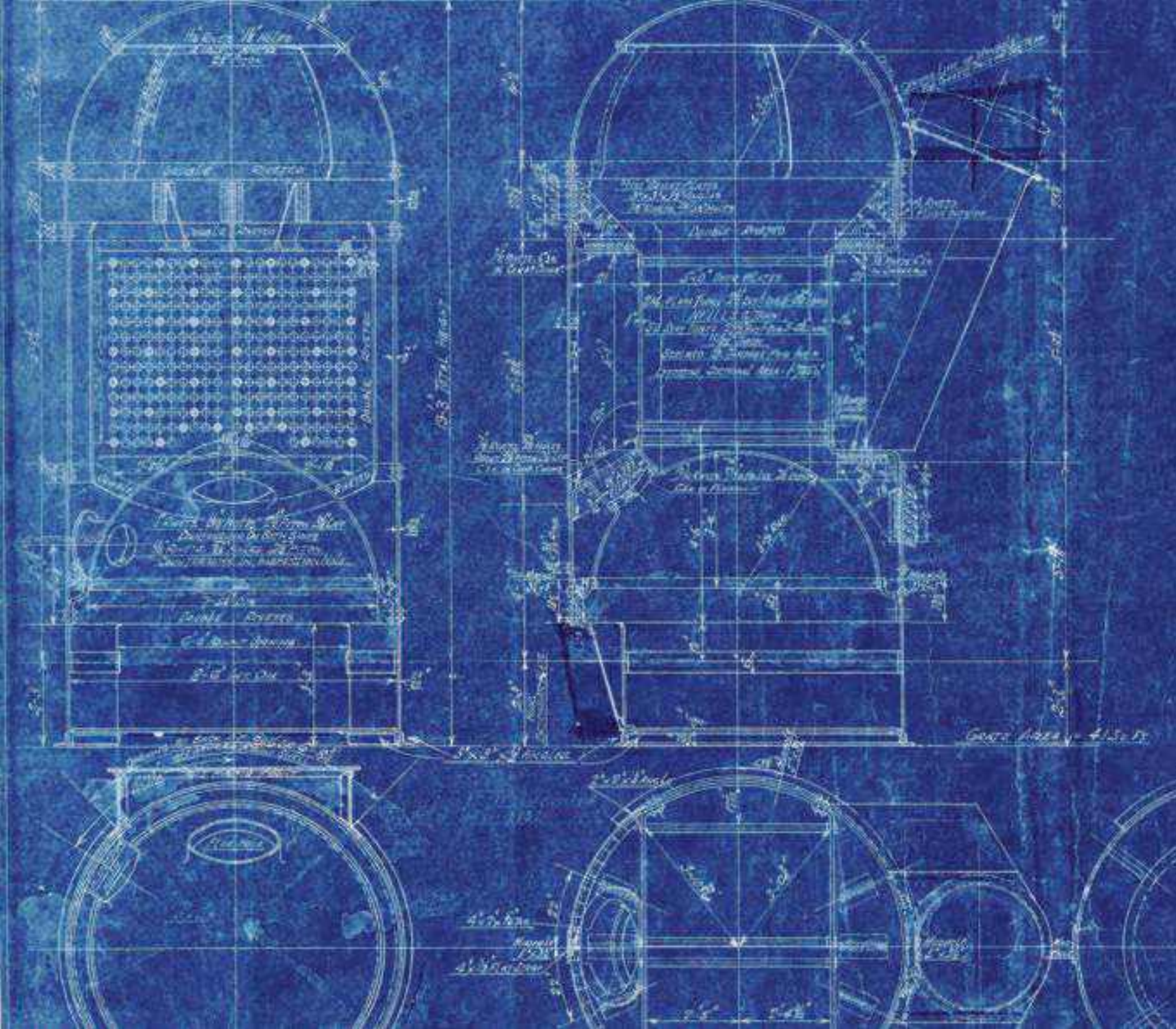
WITH THIS STALWART OF HEAVY ENGINEERING AND MANUFACTURING NOW APPROACHING ITS 150TH YEAR OF EXISTENCE, TODAY COCHRAN IS IN GOOD HANDS. HAVING CONSISTENTLY SET THE STANDARD IN BRITISH BOILERMAKING FROM ITS BEGINNINGS IN BIRKENHEAD 145 YEARS AGO, IN 2023 WE CELEBRATE 125 YEARS OF BOILER MANUFACTURE AT OUR NEWBIE BASE ON THE SHORES OF THE SOLWAY FIRTH.

DESPITE WEATHERING REVOLUTIONARY DEVELOPMENTS IN BOILER TECHNOLOGY, TWO CATASTROPHIC GLOBAL CONFLICTS AND INNUMERABLE WARS IN KEY REGIONS WHERE WE ARE ACTIVE, SEVERAL MAJOR RECESSIONS, AN OIL CRISIS, OWNERSHIP CHANGES (GOOD AND BAD), 1975'S DEVASTATING FIRE, THE TERRIBLE COVID YEARS AND TODAY'S CRUCIAL NEED TO REDUCE EMISSIONS, 2023 IS AN ANNIVERSARY WE ARE ALL IMMENSELY PROUD TO HAVE ACHIEVED.

THIS IS A LANDMARK THAT PAYS TRIBUTE TO THE CONTRIBUTIONS OF A FANTASTIC, HIGHLY SKILLED AND DEDICATED WORKFORCE DOWN THE YEARS THAT LIES AT THE HEART OF WHY A COCHRAN-BUILT BOILER IS SOMETHING A BIT SPECIAL... HERE'S TO OUR CONTINUED SUCCESS FOR MANY YEARS TO COME!

1898 2023

COCHRAN



Cochran Ltd, Newbie Works, Annan
Dumfries & Galloway DG12 5QU.

+44(0) 1461 202 111
www.cochran.co.uk

©2023 Copyright Cochran Ltd Design by CarneWhitney.com