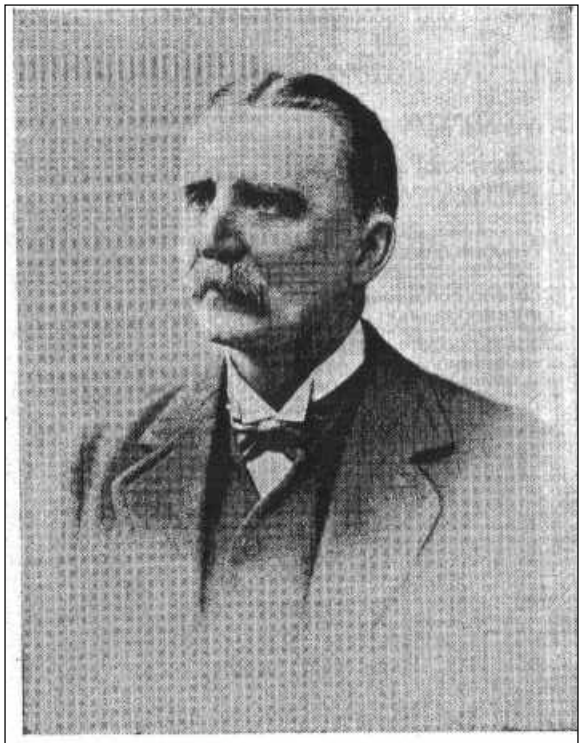
SAMUEL CLELAND DAVIDSON
1846 – 1921 founder of the firm

DAVIDSON & CO. BELFAST.



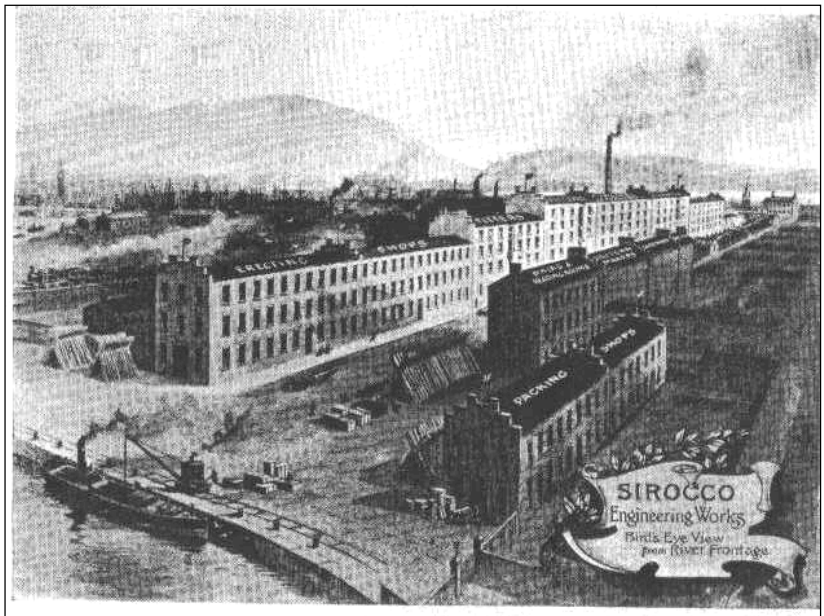
SIR SAMUEL C. DAVIDSON, K.B.E.

Samuel Cleland Davidson was an Irishman by birth, but with Scottish ancestors living in Ayrshire who settled in Northern Ireland in the early 1600's. He was born in County Down 18th November 1846 the youngest child of a family of eight, son of James Davidson. Educated at The Royal Academical Institution "Inst" Belfast, he left at the age of 15 years and entered the office of a Belfast Civil engineering firm, William Hastings, where he remained until the summer of 1864 acquiring a good knowledge of surveying, architecture and engineering.

In 1864 his father purchased a share in a tea estate in Cachar India and believing his son would have better prospects of advancement in life as a tea grower sent him to India. The tea estate was 300 miles northeast of Calcutta. Upon arrival he acted, as assistant manager then after two years became manager. After his father James's death in 1869 he bought out his co-partners and became the sole proprietor. Samuel Davidson soon recognised the possibility of improvement in the system of tea manufacture.

In 1874 he sold his property, returned to Belfast and for some years superintended the manufacture by Combe, Barbour and Coombe of his patented tea machinery and in 1881 he started the Sirocco Engineering Works Belfast to manufacture his patented machinery.

Since the success of his first tea drying machines Mr Davidson patented many world famous inventions including the Sirocco forward curved centrifugal fan which revolutionised factory and mining working conditions and the invention of a new process for raw rubber with specially designed rubber machinery for every stage of the process.



Sirocco Works, 1898

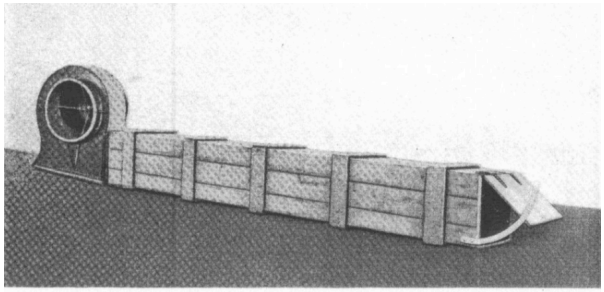
Samuel Davidson's interest in tea drying led to his development of stoves for heating by convection. These stoves were designed to give out heat only in the form of hot air, while the parts which could be touched remained cool; this meant a greatly reduced fire risk, and little emission of dust. By the end of the 1880's large numbers of Sirocco stoves were in use in local churches, halls, workrooms, schools and linen-drying rooms.

Samuel Davidson's early tea dryers had relied upon the draught induced by the furnace chimney to draw air through the trays of tea. However, even when the height of the chimney had been greatly increased there was still insufficient draught to draw the air through anything but a few lightly loaded trays. Positive pressure was needed, so he turned his attention to fans, and began a series of experiments which resulted in the development in 1898 of his highly efficient forward-bladed centrifugal fan.

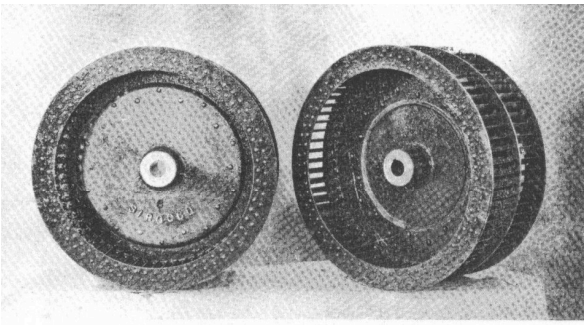
It must be remembered that in those days little was known of air movement and there was no recognised method of testing, nor were there scientific instruments available such as there are today. At that time the only types of fan available were very crude in design and could only handle a little static pressure. Positive pressure was the urgent requirement so Samuel Davidson applied his mind to developing a suitable design of fan.

So for a period of around ten years experiments were carried out by him continually on developing a type of fan which would not only handle a large volume of air but also would overcome the static resistance provided by reasonably heavily loaded trays of tea.

Samuel Davidson had to develop his own crude but effective testing method. His experimental fans were all made to the same diameter and driven at the same speed so that all test results would be comparable. Each fan in turn was fitted to the end of a square wooden test duct. At the other end of the duct was fitted a top hinged wooden flap. At the side of the flap was fixed a quadrant arm graduated in degrees from 0° to 90°. This would indicate the degree to which the door would move when blown open by the pressure of the air within the duct.



Original method of testing fan performance



Early "Sirocco" forward bladed centrifugal fan runners

As each type and style of fan was used so a record of its performance was noted. By learning from each new style of impeller used he was able to improve on the static pressure performance. Then one day in 1898 another new design of multi-bladed impeller was used and as the fan reached its full speed the door was blown fully open to 90° and stayed open. The Sirocco forward curved impeller centrifugal fan had been created.

It was during one of these fan and drier experiments that produced a large volume of hot air which reminded one of his Planter friends of the hot wind “The Sirocco” that blows across the North African desert. Samuel Davidson thought the name so apt that he adopted it as his “Trademark” and so the Sirocco name was then given to all the firm’s products and to his Belfast works.

Fans both centrifugal and axial flow types, were applied to many other purposes including forced and induced draught for boilers, the ventilation of mines, buildings, and ships, fume and dust removal, and air conditioning. The making of equipment for heating and ventilating eventually replaced the making of tea machinery as the firm’s main activity.

In 1881 he started the “Sirocco” Engineering works in Belfast to produce tea machinery, centrifugal supply and extract fans. The “Sirocco” works were unique in the respect that nothing else was manufactured but the personal inventions of Samuel Davidson its Chairman and Managing Director. The business converted into a private limited liability company in 1898 under the name of Davidson & Company Ltd.

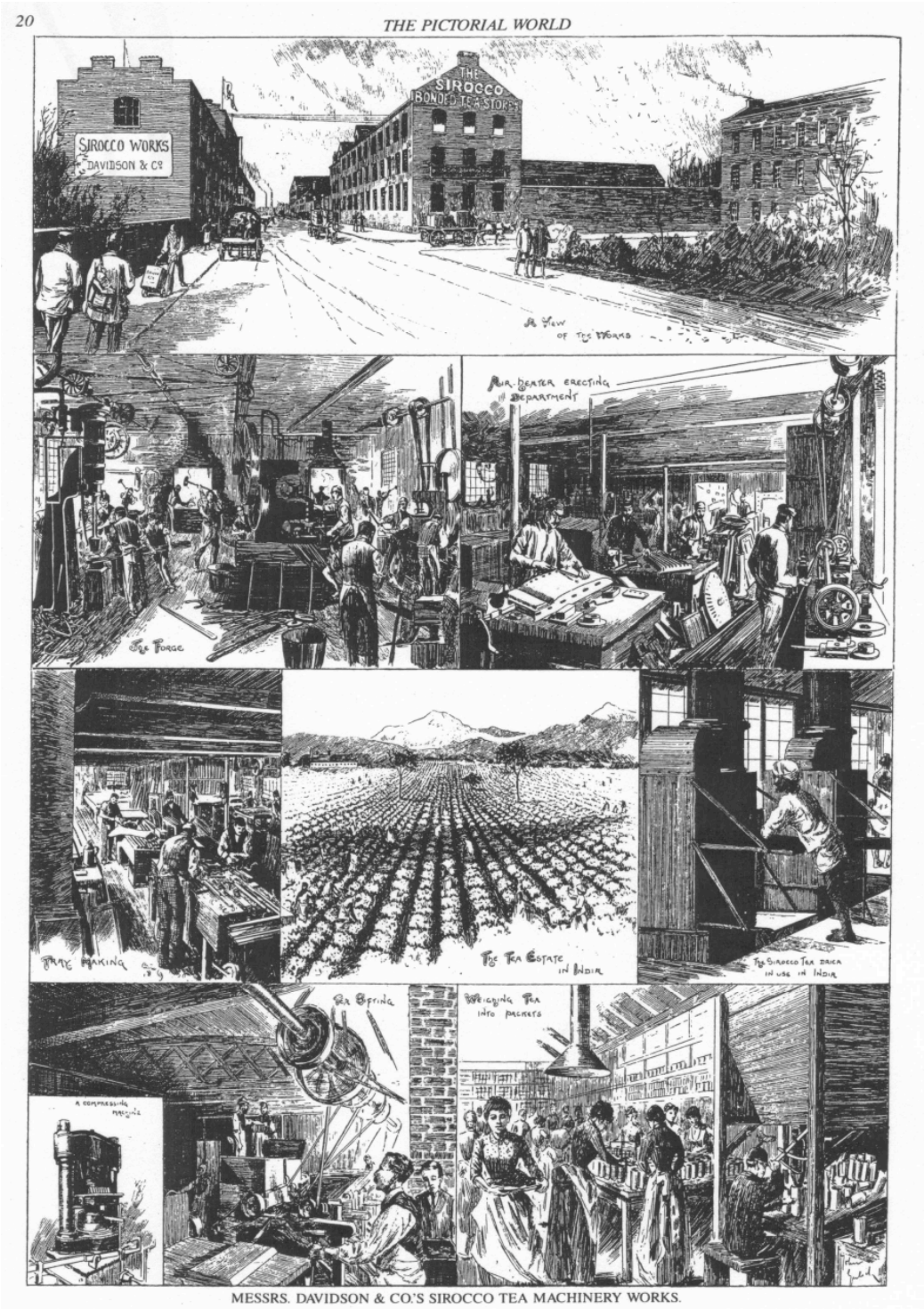
The period 1900 to 1910 saw a remarkable growth in his trading interests abroad and representatives were appointed to look after the company’s interests in India, Ceylon (Sri-Lanka), South Africa and Australia.

The First World War led to an increased demand for fans. During the 4½ years of the war the Sirocco works, among many other contributions to the war effort, supplied over 8000 fans for use in the Royal Navy and Merchant Navy. It was a rather ironic compliment to Davidson & Co that nearly every ship in the German fleet scuttled at Scapa Flow in 1919 was subsequently found to have been fitted with pre-war Sirocco fans.

Davidson & Co continued the development of equipment for cooling, drying, dust collecting, heating, ventilating, mechanical draught, pneumatic conveyance, and mechanical handling. For the ventilation of mines they produced some of the largest fans in existence, and they began to make large air pre-heaters for use in conjunction with their fans, mostly for power station use. The company held its place as one of the principal engineering firms in Northern Ireland, and continued to export most of its output.

Samuel Davidson became a Member of the Institution of Mechanical Engineers (M I Mech E) in 1888 He was awarded the KBE in 1921.

Samuel Davidson died on the 18th August 1921.



MESSRS. DAVIDSON & CO.'S SIROCCO TEA MACHINERY WORKS.

An illustrated plate from THE PICTORIAL WORLD
dated 20th December 1888

of the booklet titled " BELFAST and its INDUSTRIES"
MESSRS DAVIDSON & CO's SIROCCO WORKS