

Was Farnhill Mill at the forefront of new textile developments in the 1940s ?

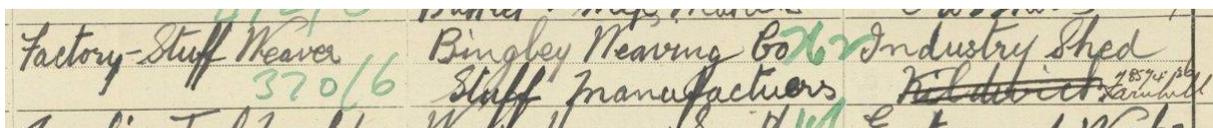
Introduction

Although Farnhill Mill burned down in 1905, that wasn't the end of textile manufacturing in the village. Although it would never provide the level of employment of the old mill, within a few weeks the remaining structure had been made safe – and the parts that could be salvaged were reopened as a weaving shed.



Farnhill Mill after the fire. The weaving shed on the right

By the time of the 1921 census, a significant number of people in the village were recorded as working for the Bingley Weaving Company at the Farnhill Industrial Shed.



Part of the 1921 census return of Jessie Holmes, of Bright Street Farnhill

Beyond that date, however, the operations of the mill building are obscure, although it was still being used as an industrial unit right up until it was demolished in the 1990s. (The site is now the Bainbridge Wharf houses.)

A recent BBC History podcast, together with a couple of recollections of the village in the years around WW2, suggest that the Farnhill Mill may – just may – have been involved in the development of new textiles at that time.

Background – the work of William Astbury

In 1928 the young scientist William Astbury arrived in Leeds to take up the newly-created post of Lecturer in Textile Physics at the University, having been recommended for the position by the Nobel-prize winner William Bragg.



William Astbury

Prior to this Astbury had worked in Bragg's laboratory at the Royal Institution, using X-rays to study the 3D structure of biological molecules, and was an ideal candidate for the post at Leeds, where one of his early research projects would be to investigate the structure of wool. (Leeds University, previously the Yorkshire College of Science, had long been an important centre for the study of wool and other textiles, and as late as the 1970s some of the buildings on the campus were often referred to as "the old Wool College".)

His early work showed that in its dry state the keratin molecules in wool had a tight helical structure; and the stretching that occurred when wool became wet was due to a relaxing of the molecular structure. He was also able to demonstrate that cross-linking between keratin molecules gave the wool fibres their strength and that these cross-links were broken and reformed when human hair was “permed”. (Both wool and hair contain keratin.)

Following his work on wool, Astbury applied the same X-ray technology to other fibrous biological molecules, including: myosin (in muscle tissue) and fibrin (involved in clotting).

This work led him to the conviction that the best way to understand the complexity of living systems was through studying the shape of the giant macromolecules from which they are made – a field of study for which he coined the phrase “Molecular Biology”.

Alongside the “pure” science, Astbury also considered possible commercial applications of his work. In the late 1930s he and his collaborators demonstrated that proteins extracted from certain types of seeds could be subjected to chemical treatment which would reform these soluble molecules into insoluble fibres.

The company ICI became interested in this idea and, to demonstrate its feasibility as a possible cheap alternative to wool, produced an overcoat made out of a yarn they called “Ardil”, created from protein extracted from peanuts. Astbury regularly wore this coat to lectures and public engagements.

Work on the development of Ardil continued during the second World War.

Meanwhile, back in Farnhill ...

So what has all this got to do with Farnhill Mill ?

In 2014 the History Group published recollections of the village from two people who had been schoolchildren in the late 1930s and early 1940s. Both mentioned something rather odd ...

Peanuts !

A strange place to store peanuts.

In late 2013 some members of the History Group spent a pleasant afternoon talking with Rosemary Hargreaves, who was born in Farnhill in the mid-1930s and lived there until she was around 10 years old. Her memory of that time was very vivid and in a wide-ranging conversation she recalled a period when peanuts were stored in the mill at the bottom of Farnhill Main Street (on the site of what is now the Bainbridge Wharfe houses). On her way to school in Kildwick, she and other youngsters would often stop off at the mill and the people working there would give each of them a small bag of nuts to eat.

This little story fitted nicely with an item in our archive: a page from a magazine produced in the late-1950s by South Craven Secondary school. First-year pupils had been asked about where they live and this is what first-year pupil Irene Rishworth had to say about Farnhill and Kildwick:

Some History of Kildwick and Farnhill

In Kildwick there used to be a smithy's shop which opened on Thursday. The local farmers used to take their horses to be shod. But now the shop is used for other occupations. In the village there is what used to be the old post office which now is a house. In Farnhill there is a mill that weaves silk and rayon. It was once a very large one and extended half-way up the main street but part of it is now houses and shops. During the war the mill was used for storing peanuts. When a lorry full of peanuts came, some boys waited in hiding until the driver went into the mill. Then they crept out and cut a hole in the bag and filled their pockets. But now the mill is in use again.

Irene Rishworth 1A

So, an awful crime was committed. But does anyone know why peanuts were being stored at the mill ? How long this went on for, and why it stopped ?

The original "Anecdote" – published on the History Group website in 2014

Is it possible that peanuts were being stored at Farnhill Mill because it was involved in the development and manufacture of Ardil ?

Appendix 1 – What happened to Ardil ?

Ardil followed a trajectory which has become common to many UK innovations. Its rise and fall is best outlined by summarising accounts in the major newspapers of the period 1944 to 1962.

1944 to 1948 – Development work

A number of newspaper articles revealed the interesting prospect of a non-shrinking, easily dyed, moth-resistant textiles being produced from peanuts. Few mentioned William Astbury but many described the development being carried out by ICI.

It was noted that ground-nuts were being grown in various parts of the Empire and that this production could be expanded to meet the need for the nuts to produce margarine as well as Ardil.

Some of the local press reported on the local companies, particularly Bradford and Halifax areas, that were involved in the developments. Bradford Technical College appears to have taken a leading role and, in thanks, was given £700 by ICI to provide scholarships to research new textile fibres.

1948 to 1956 – Pilot production

In his 1948 annual statement the ICI chairman made two comments that, in retrospect, perhaps indicated some of the problems that would lead to Ardil failing to become a success.

- He announced that work was progressing well on two new fibres: Ardil (made from monkey-nuts) and Terylene (made from coal).
- He also called for the government to develop the resources of South Africa, Rhodesia and East Africa.

The second of these comments was almost certainly a reference to the UK Government's post-WWII "East African Groundnut Scheme", an ill-fated attempt to farm groundnuts on an area of 5000 square miles in Tanganyika (now Tanzania). This project would have been important for the production of both groundnut oil and Ardil, but was a fiasco and was abandoned in 1951. It cost the government £36 million (equivalent to over £1 billion at 2020 prices).

Despite this, in March 1950 the ICI director of research was able to announce that a factory for the production of Ardil was under construction in Dumfries.

The idea that synthetic fibres might replace wool was a threat to the wool industry, but so was the increasing price of pure wool. Ardil/wool mixtures seemed to provide a solution and in September 1950, in an article in the Yorkshire Post about the increasing price of wool, a representative of a Leeds-based wholesale clothier, was reported as saying "... a certain amount of synthetic fibres will be offered to us next month so that we can make goods at prices people can afford to pay. I cannot see any other way out of the situation."

In April 1951, it was reported that the 1952 output from the Dumfries factory was expected to be between 3000 and 4000 tons of Ardil at a cost of around 50d per pound. Merino wool had just reached a record price of 300d per pound. (A revised anticipated production figure of 20,000 tons was announced in September 1952.)

It was not just garment manufacturers who were hoping to take advantage of Ardil as a low-cost supplement for wool. In August 1951 the annual meeting of the British Hat and Allied Feltmakers Association called Ardil “a wonder fibre”.

In the same month a firm in Kilmarnock announced that it was about to start work on developing Ardil for possible use in carpets.

At the end of November one of the researchers from the ICI pilot plant in Dumfries gave a talk to the Halifax Textile Society in which he described the advantages of a wool/Ardil mix over pure wool. At the end of the talk the president of the Society said “ ... the time had gone when they feared the competition of man-made fibres. As standards of living were maintained people bought more clothes and it was good to have something which could dilute wool and so keep down prices.”

By the start of 1952 the Yorkshire Post was reporting that suits made from a mixture of wool and Ardil would be produced by a Leeds clothing firm later in the year; and, in June, London fashion fortnight included examples of fabrics made from a number of man-made fibres, including an Ardil-rayon-wool mix which had “outstanding crease-resisting qualities.”

1951 to 1956 – Promoting Ardil

As early as 1951, Harold Wilson (then the President of the Board of Trade and later Prime Minister) promoted Ardil as a British-made advance in textiles, by wearing a “monkey-nut” suit in the House of Commons.

Also that year, ICI produced a poster-advertisement that used some the design elements that would feature in the Festival of Britain. The marketing blurb included a brief mention of Ardil, almost as an after-thought.



C A R B O N

*C*ARBON is one of the most widely distributed of the elements, for it is an essential constituent of all living matter. Carbon appears in the crystalline form as diamond and graphite and in the amorphous form as charcoal. Combined with other elements it gives innumerable chemicals all of which are vital to our existence. Carbon atoms readily join with each other, and with those of other elements. They will link up into rings, form long chains of atoms like strings of beads, and even branch out to make complex three-dimensional molecules. The study of carbon compounds is so important that it has become a specialized branch of science known as Organic Chemistry. Hundreds of thousands

of different molecules have already been made from carbon atoms in conjunction with those of two or three other elements, such as hydrogen, nitrogen and oxygen. An almost infinite number of new ones remain to be discovered by the organic chemist. Since 1856, when Sir William H. Perkin made the first synthetic dye, mauve, the manufacture of dyestuffs has been a focal point of the organic chemical industry. The dyestuffs made by I.C.I. are carbon compounds, and recent I.C.I. research into carbon derivatives has resulted in such epoch-making discoveries as new anti-malarial drugs, new textile fibres like 'Ardil', and 'Gammexane', a revolutionary insecticide.



In 1954 a further ICI advertisement, this one promoting Ardil and the Dumfries factory, appeared in many newspapers.



Sorcery and Science

RUMPELSTILTSKIN is said to have spun coarse straw into threads of gold. In recent years a transformation hardly less remarkable has been achieved in I.C.I.'s laboratories, where a new fibre called 'Ardil' has been derived, by a complex chemical process, from the protein of groundnuts. When blended with other fibres 'Ardil' makes fine, soft fabrics, which can be turned into coats and suits and into warm, lightweight winter dresses, or — such is its versatility — into carpets, blankets and rugs. This new fibre, too, is low and stable in price, unattractive to moths, and it is produced in a form that makes textile manufacture easier.

I.C.I. has lost no time in putting into production this outstanding textile material which opens up new fields in fashion and design. A factory capable of manufacturing 20 million lb. of 'Ardil' staple a year has been built at Dumfries, Scotland, at a cost of £3 million, and clothes containing the fibre are already in the shops. 'Ardil' is but a further example of the way in which modern industrial research is developing valuable products from unlikely substances — for the benefit of all.

Imperial Chemical Industries Limited



At the 1955 British Industries Fair, ICI had a double-display of items made from both Terylene and Ardil-wool blended fibres. By this time Ardil had its own logo, and advertisements promoted its moth-resistant properties – as well as noting that it was in Ardil-cotton mix fabrics, rather than on its own.

You'll be advised to buy

'Ardil'



because 'Ardil' is warm,
absorbent and completely non-irritant

'Ardil' is the man-made fibre that helps to create comfortable clothes. Comfortable because 'Ardil' is warm and absorbent, like wool. Comfortable because it is soft and smooth—like cashmere and silk. Clothes with 'Ardil' cannot irritate even the most sensitive skins.

For the time being you will find 'Ardil' mainly in shirts, pyjamas and children's wear.* There is nothing to equal their quality at such reasonable prices. Once you've experienced the comfort of 'Ardil' you'll be eager to wear it again.

** Usually made from 'Ardil' and cotton, these fabrics have a woolly feel, but you can put them away without worry, since 'Ardil' is moth-resistant.*

FABRICS
- all the better for



IMPERIAL CHEMICAL
INDUSTRIES LIMITED,
LONDON, S.W.1

NA.57

An ICI newspaper advertisement from 1955

Even in early 1956, when ICI must surely have known that the end was nigh for Ardil, advertisements were promoting it as the modern fabric, worn by all the kool-kats as they danced around their new Dansette record players.

It's a good feeling...

... just to slip inside a shirt containing 'ARDIL'*. To welcome its all-year-round comfort and casual ease. A shirt with 'ARDIL' has warmth without weight, healthy absorbency and a soft, smooth texture that's kind to the most sensitive skin. Here, for the first time, is luxury at a reasonable price. Seek out a shirt containing 'ARDIL'. Take a good look at it, handle it—best of all—wear it. For 'ARDIL' really makes a shirt feel good. And what 'ARDIL' does for a shirt, the shirt can do for you!



'Ardil'

is the man-made protein fibre
—soft as cashmere,

smooth as silk, warm and absorbent as wool.

It's moth-resistant too, and completely

non-irritant. Blended with

other fibres, it gives clothes

an unmistakable

touch of luxury

—at prices

you can afford.

SHIRTS
—all the better for

Ardil 

NA. 116

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON, S.W.1.

An ICI newspaper advertisement from early 1956

1952 to 1955 – Declining interest

Even in the early 1950s, in newspaper articles promoting the advantages of Ardil, there were words of caution about its long-term future, particularly as synthetic fibres were developed that were equally, if not more, versatile. This paragraph from the Manchester Evening News (12/9/1951) provides an example:

There are indications that Ardil ... may disappear from the scene in some years' time, when the shortage of natural wool has been overcome and Terylene and similar fibres have been further developed. Ardil is much more, frankly, a substitute and so far can only be used in mixtures with wool. It is not yet satisfactory on its own.

Whether or not the suggestion that Ardil could only be used as a mixture could only be used in mixtures was true or not, it was certainly a foreshadowing of the fate of Ardil.

In September 1952, representatives of ICI were claiming that Ardil-wool mix carpets would “soon be available”; but the fact was that 1952, the year in which Ardil production was expected to reach 20.000 tons, did not provide anything close to the anticipated breakthrough.

In a Bradford Observer supplement from January 1953, Ardil was still being touted as “coming soon” but by the end of April the London News Chronicle felt inclined to start a fashion piece with the question “How wonderful is the wonder-cloth ? [Ardil] goes on sale in London this week and gives us, at last, the chance to find out. Some of us at any rate. For the quantities of garments made from Ardil blended cloths are as yet small.”

It was 1954 before material made of Ardil-wool mixtures became available, in small quantities, to the general public; with prices ranging from 5/- per yard for fabric suitable for blouses, to 27/6 per yard for costume or coat lengths. Prices decreased during the year as Terylene-wool mixtures and other man-made fabrics, such as Orlon, came on to the domestic market.

1954 also saw ICI reveal its best ever trading year. The annual report noted that “A substantial and increasing part of our capital programme is being devoted to the development of man-made fibres”. However most attention was paid to the opportunities provided by Nylon (jointly owned by ICI and Courtaulds) and Terylene, with Ardil receiving just a brief mention.

The declining interest in Ardil was also evident in a report in early 1955 by the Chairman of the British Man-Made Fibres Federation. Here again, the report concentrated on fibres developed as by-products of the petrochemical industry, with Ardil referred to simply as “protein fibre”.

1956 / 1957 – The end of the line

Clearly Ardil was not going to be the next “big thing” in textiles – the future of man-made materials had already moved on from natural to artificial fibres.

On April 1st 1956 ICI merged its management of Terylene and Ardil production, with the new “Fibres Division” to be run from the existing Terylene Council offices in Harrogate.

In September 1957 it was announced that, due to continued growth in demand for Terylene, the Wilton production plant on Teesside would be expanded at a cost of £20m. At the same time, production of Ardil, at Dumfries, would cease. The Daily Herald reported (17/9/1957):

Even the great ICI occasionally backs the wrong horse. The “Ardil” fibre project, reported to be disappointing in the last annual review is now dropped. Most of the staff are going on to “Terylene” the demand for which continues to increase.

By May 1959 articles in the press were describing Ardil as “a disappointment” or even as “ICI’s failure”.

Appendix 2 – What happened to William Astbury ?

It is a shame that William Astbury’s name is not better known, and that he remains one of the “nearly men” of molecular biology – a field that he both named and helped pioneer.

In a letter to the Vice-Chancellor of the University of Leeds, in 1945, Astbury wrote “all biology, is now passing over into the molecular structural phase ... I suggest that Leeds should be bold and help to lead the way”. The University Senate allowed him to establish a new department but would not allow him to use the term “molecular biology” in its name, due to opposition from senior biologists who felt that, as a physicist, Astbury was encroaching on their territory.

Instead he was appointed Professor of Biomolecular Structure in 1946, a post he held until his death in 1961. The department he founded is now known as the Astbury Centre for Structural Molecular Biology.

Sources

“The man who almost discovered the double helix” a History Extra podcast – <https://www.historyextra.com/period/20th-century/the-man-who-almost-discovered-double-helix-podcast-kersten-hall/>

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“Tanganyika groundnut scheme” – Wikipedia page – https://en.wikipedia.org/wiki/Tanganyika_groundnut_scheme

Newspaper reports and advertisements were obtained from the British Newspaper Archive. Access to this resource is provided free at all North Yorkshire libraries