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## Introduction

As a student of fashion I spend one year engaged in the study of textiles, particularly in the practical aspects of handweaving related to design for fashion garments. In that time I became intrigued with the particular aura which surrounds all aspects of the textiles trade. Anyone involved in the business seemed to immediately share not only specialised interest in his own field but also a real love and enthusiasm for the tradition and historical background to the weaving art. Here in Ireland we have such a long tradition in weave that the history of the trade has become almost inextricable from our own ordinary lives. It was this sense of inter-relation which prompted me to base my paper on this subject.

This thesis is concerned with fabric particularly woollen fabric of the tweed variety. It traces the path of woollen production from its early days to present industrial development. It speculates on the place which such cloth played within a fashion context, the interesting traditions and folklore, the attitudes which attached themselves to certain of its aspects and indeed the place fashion itself held in our society.

I was interested in the latter primarily as expressed by J. Horn in his book 'The Second Skin'. I agree with the view that culture and the study of such are greatly enriched by the fact that a definite style can be seen running through all aspects of a given period. Horn says - 'the development of certain styles in the artifacts of a culture reflect the less tangible mentifacts ie the ideals and values, that are ascendent in that culture. Also, a study of the historical development of styles shows that changes in dress are conditioned by world events' - such a view supports the subject of this thesis.

Throughout this thesis I intend to uncover the line which links the past to the present so easily, traditional structures with modern interpretations. While it is true that cultures world wide possess a similar history in this field, but I shall adhere mainly to the produce of the British Isles where regional differences shall no doubt provide enough fuel for the duration.

It must be explained that the sense of the word fashion is dependent very much not only upon its literary context but also upon its historical context. Fashion as a calender of events and related time scale. Fashion as a group statement political and social and finally fashion as the fast moving influence it is on modern life.

The subject is wide ranging and required constant support from areas such as handbooks on method, social historical fact, and up to date information on any new innovation which effect it. All of this in order to maintain the story in its full context. In writing this paper I experienced difficulty in finding such information in any direct form. Obviously there is an opening in this literary field for just this subject. However this paper should at least demonstrate the wealth of knowledge just waiting to be tapped and presented to an ever interested industry composed as it is mainly of individual craft weavers at heart.

## PART I - CHAPTER I - Cottage craft to industrial concern

Many of today's well-known industries - cotton factory, brick  
handmillers etc. - have their roots firmly anchored in what is called

### PART I CHAPTER I

the cottage industry. From the humble spinning of the flax to

the cotton factory, the cottage industry has played a vital part in the

development of the textile industry. It has been the

essential starting point from which the industry has grown to the

Contents: 1. In the beginning ...

2. The middle years ...

3. External factors affecting growth ...

4. Further disruption ...

5. The road to recovery.

The first part of the book deals with the early years of the

industry, from the time when the first spinning wheels were used

to the time when the first cotton factories were built.

The second part of the book deals with the middle years of the

industry, from the time when the first cotton factories were built

to the time when the first cotton factories were built.

The third part of the book deals with the road to recovery.

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The thirteenth part of the book deals with the road to recovery.

The fourteenth part of the book deals with the road to recovery.



PART I    CHAPTER I    Cottage craft to industrial concern

Many of today's most advanced industries - Arklow pottery, Irish handknitters etc. - have their roots firmly embedded in rural folk arts, but few have been persistent in their metamorphosis as the woven textile trade. Over its entire history the progress of the textile trade has been slow and faltering but the dedication of those involved, many who have served their time as hand weavers, have been the essential driving force which has sustained the craft through its many bouts of depression.

The tendency of the woven trade to be a part-time home-based occupation has been a blessing in disguise, for while this did leave it open to the devastations of social upheaval which disrupt the close knit family unit and therefore effectively the working unit, it also meant survival through continuous use. As a part-time occupation which allowed for other daily duties, such as farming, fishing etc. weaving provided not only an outlet for the artistry of a tenacious people against a backdrop of emigration, strife, famine and eviction, as any historical account will testify, but also a commercial relief too often needed.

Similarly while effort involved in the large scale revival of a dying folk art is often wasted, weaving has time and time again proved itself (the boom of the industrial revolution, where towns such as Manchester and Belfast put their names on the map due to their accumulated wealth from textiles; present day export figures in fabric and garment production) adaptable and economically viable enough to take a place in the emerging world of modern technological production. It is particularly interesting that this adaption was achieved without affecting the strong ethnic nature or aesthetic values of the product. Here then is the story of that craft, from cottage concern to factory industry.



## In the beginning

The earliest weaving was indeed a functional exercise, concerned primarily with the production of clothing fabric essential to survival. Documentary material such as references to woven cloth and garments found in illuminated manuscript like the Book of Kells and ancient stone carving show that while the handle (see Glossary) of such homespuns was obviously coarse, to judge from its portrayal as falling in heavy, evenly balanced folds, structurally it must have been sound.

Time, moths and the need of the poor to wear to 'rags' whatever clothing they possessed leaves us with little visual evidence to support our theories. However, the National Museum of Ireland does contain small fragments of woollen homespuns somewhat darkened by their years of contact with wet peat but none the less intact. Yet it is to these same bogs' amazing preservative powers that these items owe their existence.

The most notable piece of these is a fragment of cloth estimated at around 700 BC found at Cromaghs, County Antrim. Even from this small piece of physical evidence it is easy to appreciate the simple beauty of woven cloths primitive beginnings. Indeed it is the renewed interest today in such simplicity - founded no doubt in the Irish cultural revival of the 1920's - coupled with the nostalgia associated with time past and the element of human experience, that provide the strongest selling point of today's homespuns.

To illustrate the story of weaving in Ireland it is probably best to follow the history of one such cloth - Donegal Tweed - whose case history has been typical in its origin, fight for survival and present situation, to act as an overall representative.

Stories of the High Kings in Ireland refer frequently to the place which woven textiles occupied in the lives of these legendary people. Even in those early times, the importance of rank denoted by the quality of one's clothing was known and respected. Indeed it was to be the first of many legislations of that nature, that under Breton law an acknowledged number of coloured garments reflects a man's standing in his community.

Royalty received seven such garments and were never conservative in their colour or pattern choice. Rich shades of red, blue, green, purple and white often in sharp plaids were favoured. Nobles made do with three colour choices while poets, for once held in higher esteem than sword skill, commanded six. The lowest rung of the bardic system, a slave could expect to spend his life in conspicuous, disinfectant saffron (the antiseptic power of saffron was a quality among its many, a dye, spice, perfume etc.) Embellishment such as embroidery was popular as yet again our historical religious documents show.

### The Middle Years

Twelfth century Tyrconnell, a land which can be roughly equated with the borders of present day Donegal, was the homeland of the people who were to sew the seeds of today's weaving traditions in the people who now produce Donegal tweed. In the main they were the subjects of the O'Donnells, a tough uncompromising people who resisted the pressures of Anglo-Norman invasion for 400 years and managed even then to carry on a flourishing trade in homespun cloth from the coast of Tyrconnell to Brabant and other medieval trading centres in Europe. The cloth produced was good in all aspects and in the seventeenth century earned the notice of the Florentine bankers who capitalised the handweavings monks of Tyrconnell and thereby promoted healthy export which continued until the





"Irish Chieftain" Drawing by Durer  
National Gallery, Dublin

Fig. 1



defeat of the old order at the battle of Kinsale (1602).

Such were the early origins of tweed in Ireland, appreciated for their practicality and admired for their charm, simplicity and quality. As yet politics had only served to provide patrons for the craft but that was to change as the era of financial domination was about to begin and politics were to become the means to any financial end.

During the sixteenth century homespuns had reached a high level of technical excellence, handed down traditionally by word of mouth through the generations. Such a system may appear haphazard but had proved itself a trusted method for many years. However around this time the guild system began to formulate itself into a highly efficient and organised group membership. Their presence and the firm grip they began to exercise on the pulse of the woven cloth trade was to prove a mixed blessing.

The guild's therefore (for at the time all crafts adopted the system) quickly established their power. Composed of merchants and traders rich enough to make their presence felt, the guilds set about imposing quality checks on all cloths and subsequently cloth producers under their jurisdiction. This effectively sealed the trade from any outside enterprise or competition. So the advantages of promoted quality through check screening meant a 'closed shop' and financial monopoly for the few. Healthy opposition vanished.

Constant vigil and rigorous training were two key factors in the guild view. The title of master craftsman was bestowed on persons who succeeded in satisfying the established master with the presentation of their final test, their masterpiece, after having completed specified

training. Such a title was a valuable commodity as it allowed for the legal employment of apprenticed youths to the trade, who paid handsomely for their education thus providing a boost to the 'master's' income.

An apprentice could expect to work seven years, almost unpaid, alongside his chosen teacher before emerging into the travelling life of the journeyman. Such graduates served the length and breadth of the countryside, weaving cloth from roughly spun yarn supplied by the cottager.

"the thread was generally taken to the weaver in a sack, on a horse's back, by the man of the house, but if it was the woman who took it, she put chabs on the horse, laid the sacks of wool across them, and sat up behind herself, and if, for instance, forty yards of flannel were required, at least sixty pounds of thread had to be supplied to the weaver".

In Living Memory Traditions.<sup>1.</sup>

As can be seen from the above quote and the following lines; much the same occurrence could be seen within 'living memory' in parts of Ireland but they must resemble closely the medieval methods.

"Weavers, the best known of whom were Thomas Lavelle of Pollagh, Jamesie the weaver and Mairtin Ban, were regarded as the wise men of the district. People treated them with respect. For if they were not treated in this way, they might have their revenge on the people by making bad cloth for them".

In Living Memory Traditions.<sup>2.</sup>

The journeyman tailor might often follow on the trail of the weaver, and at the end of this further seven year period, the masterpiece would finally be presented for close scrutiny to the guild.

The close communication between guild masters did allow a passage of knowledge among members especially in relation to technique and any





*The Gentleman of Ireland*



*The Gentlewoman of Ireland*

26. 27. FROM SPERDE'S MAP OF IRELAND IN 1610



*An regene eirio.*  
*Mulier Hibernica, athenica*

28. AN IRISHWOMAN  
From an engraving by Hollar



*Normandische Frau von Dieppe*  
*Mulier Diepana*

29. A WOMAN OF DIEPPE  
From an engraving by Hollar

Fig. 2



advances in that field which might help improve or speed production. At that time however these were few, hand traditions held sway and yielded only slowly to mechanised invention (which shall be discussed in later chapters).

### External Factors

In 1699 serious changes began to overtake the wool trade with devastating results. Until this time the Irish dress consisted mainly of four garments all of which upheld the woven trade of one kind or another (wool/linen): the Mantle (Brat) a large sleeveless woollen cloak or cape worn by both men and women, semi-circularly wrapped around the body and over the head in varying lengths, the linen smock (leine), short jacket and trews. However legislation was passed at this time by the occupying English against any form of old Irish dress while the adoption of English costume was insisted upon. As a result the number of garments dwindled to two, the ever present leine (of linen fabric and often coloured with saffron, a protection against lice) and a huge wool mantle. This mantle was made of a shaggy surfaced cloth (napped). Such cloth was made by a method known as pile-weaving, probably a fur imitation.

This cloth and garment of great antiquity was present in Europe and Ireland as early as 1060 AD and is still made in eastern European countries such as Hungary and the Balkans. Mantles like this were made in Waterford and exported to England and the continent in large quantities. In 1504 2,340 mantles were recorded as having been sent to Bristol and Bridgewater.

The mantle soon became very fashionable, not only for its warm practicality but for its individuality through colour and pattern. As stated by Eachard in 1691<sup>3</sup>, speaking of the cloak as in current use, stating

that the Irish:

"commonly wear a mantle or Shag Rugg deeply fringed, and well set out with many colours".

Plaids and tartans became extremely popular and this personal taste coupled with direct oppression of garment style choice was to give fashion a new meaning as a strong identity statement.

The plot of English legislation was not to end here, disliking competition for Irish export markets (for in 1696 Ireland was exporting wool and cloth to about every nation) the English passed a Bill prohibiting the export of wool or cloth to England. Any Irish goods found in England were to be confiscated. The Lord Deputy, a Home Office appointee, had the Irish Legislature place heavy export duties on Irish raw wool and woollen cloth, which Irish weavers could produce more cheaply than England. Further crippling taxes such as these and an exodus of Irish workers caused trading houses such as the Coombe, Spitalfield and Weaver Square in Dublin to collapse. The industry went into sharp decline.

Smuggling, no stranger to the Irish nation, in the form of specialised 'wool-running' between Donegal and France helped to maintain the business flow between these locations at least. But such measures did little to help the overall picture and decline continued under the burden of restrictive policies, followed closely by the linen and silk industries.

The years 1607 - 1831 saw the advent of the industrial revolution which quickened the pace of textile development world wide. An amazing number of new machines were invented, steam power replaced the hand and horse. America began its own textile industry while England settled itself as a major manufacturer safely controlling Ireland opposition in these matters.



So Ireland slipped further behind failing to rally even when attempted restructuring of the craft industry took place in 1838.

### Further Disruption

To understand subsequent events it is necessary to consider and understand the Irish situation. As any history book will testify the people has been subjected to a high degree of oppression under British rule and in 1846 were in a poverty stricken and demoralised state. But this year 1846-47 was to bring yet another blow, a physical devastation which even the proud Irish could not withstand.

The year of the Great Famine, a blighted potato crop, the staple food of the people repeatedly afflicted each season and death and emigration all but cleared the country of its most valuable resource, its people. Left to fend for themselves the women and young picked up a thread which had sustained them in hard times before. Weaving was to lead to eventual economic recovery but to begin with it provided at least a recuperative therapy and a restoration of individual pride for the Irish people. The comforting nature of this weaving rhythm and its subsequent therapeutic power is best described by a passage from a little handbook 'Aranwear and Tweed'<sup>4</sup> in the Enjoying Ireland series:-

"A typical traditional hand loom demands the simultaneous use of the weaver's hand and feet in repetitive rhythmic accord; the click-clack-thud of the loom's rising and falling limbs vied with the hiss and flick of the ceaselessly flying shuttle slicing between the rows of threads; long fingers and dexterous wrists moved rapidly in a hypnotic mime of some primaeval sign language, pushing, pulling, jerk; twisting, throwing, catching - complex visual and audible rhythms syncopating with the steely droning beat of pedal manipulation. Just as the weavers skill had been passed down to him through countless generations, so did his loom form an



integral part of his existence. It seemed to respond in a unique way to his handling, and he, in turn, became almost an extension of his loom, treating it with a sympathetic intimacy normally reserved for relationships between human beings."

On reading such a description it is easy to understand why weaving is still used as an educational therapy in medical cases.

### The Road to Recovery

Many years of education, appeal and a massive programme of aid began to build an industry, this time one which would come out of the cottages and into the world market. Though due to the efforts of far-sighted Irish men and women (often with great help from the clergy) it was to be an English man who is best remembered as the saviour of Irish industry. Arthur Balfour, British Prime Minister in 1891, recognising the situation in Ireland particularly in the West, set up a 'Congested Districts' board whose function was to promote Irish industries, including weaving, which would aid in the restoration of a decent standard of living. Similar schemes sprang up in other areas and did help not least in regenerating interest and life in a people degraded by circumstance.

This was to be the foundation of many of today's well known established types of woven fabrics. The slow pilgrimage had begun but it was not to be smooth going even now. Social events were still to impose delays.

The outbreak of the First World War in 1914 did not bring to a halt the production of cloth but seriously affected the quality and therefore reputation. Homespuns fell into disrepute at first due to bad

workmanship and eventually it fell foul of the rapidly changing demands of a growing fashion industry.

Yet again drastic restructuring was needed, revival and reorganization were obviously the key. Tradition, man power and enthusiasm were ever present but these it seems were not always enough.

## PART I CHAPTER II Hand versus Power (Including Inventions)

Today the hand industry is being supplanted in Ireland. Power is produced on a vast scale and is being used in ever increasing quantities. But what of the hand industry produced a century ago, when weaving was done by hand and only their own handiwork was used? The answer is, of course, that without benefit of the modern machinery of the hand industry, the hand industry would be unable to produce the goods of the hand industry. The hand industry would be unable to produce the goods of the hand industry.

### PART I CHAPTER II

#### Hand versus Power.

Contents: 1. Hand tradition and production

2. Inventors and inventions

3. Power loom processes

4. Machinery of a New Age.



PART I CHAPTER II Hand versus power (including inventions)

Today the tweed industry is firmly established in Ireland. Tweed is produced on a mass market basis and demand is ever increasing. But what of the woven fabric produced a century ago, when weaving men and women had only their own hereditary knowledge of the ancient craft to rely on, without benefit of the modern technological advances often taken for granted; supplied patterns, design consultants, ready spun yarn or colour-fast synthetic dyes? At least in the case of Donegal it is necessary to return only to the turn of the century to see the traditional hand craft.

Hand: tradition and production methods:

In 1900 Donegal, tradition still reigned in almost complete defiance to the work of Arkwright, Wyatt etc. In the family home, weaving remained the laborious work it had always been, carried out through numerous processes with the care and attention always attached to these events.

And an event indeed it was as each stage of production had a local ceremony attached where a crowd gathered in the chosen house to 'make light' the work involved. Many references to these occasions colour the pages of Irish plays and novels.

"It was at Mary and Sean's house that I saw how the flannel after it is woven, is thickened for the making up of men's clothes. Mary came in one day to the cottage. 'We have twenty yards of flannel ready', she said, 'and we'll be thickening it tonight. You might like to see it if you can come over in the evening?'

It was dark and the road was dim under the starlight when I walked to Onaght. The door of Mary's cottage was open and as I went in to the cheerful interior she got up from her stool to welcome me; Sean was behind her and the room was full of people who had come to watch and

assist with the work, and a lamp hanging by the chimney spread a soft light on the row of faces."

Elizabeth Rivers,  
A Stranger in Aran, 1946.<sup>5</sup>

"Big preparations were generally made for the carders. A special currant cake was made and there might be a hen killed for dinner. The girls usually arrived in for a day's work at about ten in the morning, and they were always a merry gathering. Once they started to work they sang and chatted and joked all the time till they had finished".

Wool and Woolwork in Keel<sup>6</sup>, from  
Irish spinning, dyeing and weaving  
Lillian Mitchell.

The hand method is steeped in local custom and tradition but the processes are still used as straight forward today.

The first step for the weaver a century ago was to shear his flock of mountain sheep; this was notmally done in June or July. His wife would then take the shorn fleeces, some turf and a vat to the nearest river. When she had lit the turf beneath the vat of river water she would add some washing soda, put in the fleeces, pound them violently and - when the water was hot enough - would get in and trample on them to loosen the dirt. This done, the fleeces would be pounded in the river with a stick until snowy white; they were then squeezed out and spread on the grass and hedgerows to dry.

Next came the dyeing, a process true to folk art traditions. Colours being taken from local sources, flora and landscape, often imparting a distinctly regional colour where the lichen used to dye was indigenous to the area (a more detailed account of the dyeing process and substances can be found in following chapters).



Before woollen spinning could take place the fibres must be made lie side by side. This was done by carding the wool, gently opening the fleeces and teasing the slightly oiled fibres into order. This then was the next social occasion after shearing and one to which was attached great merriment.

"They's be singing sora mile grads and come-all ye's of all kinds, and they'd be fixing matches for each other, and everyone would try to have a special bit of new gossip for the women of the house."

Living Memory tradition,<sup>7</sup>.  
Lillian Mitchell.

As with many Irish events the 'little people' were given credit or discredit for any mishaps during the making, any tangled threads or trouble with the carding, blame could be squarely laid in the hands of the fairies.

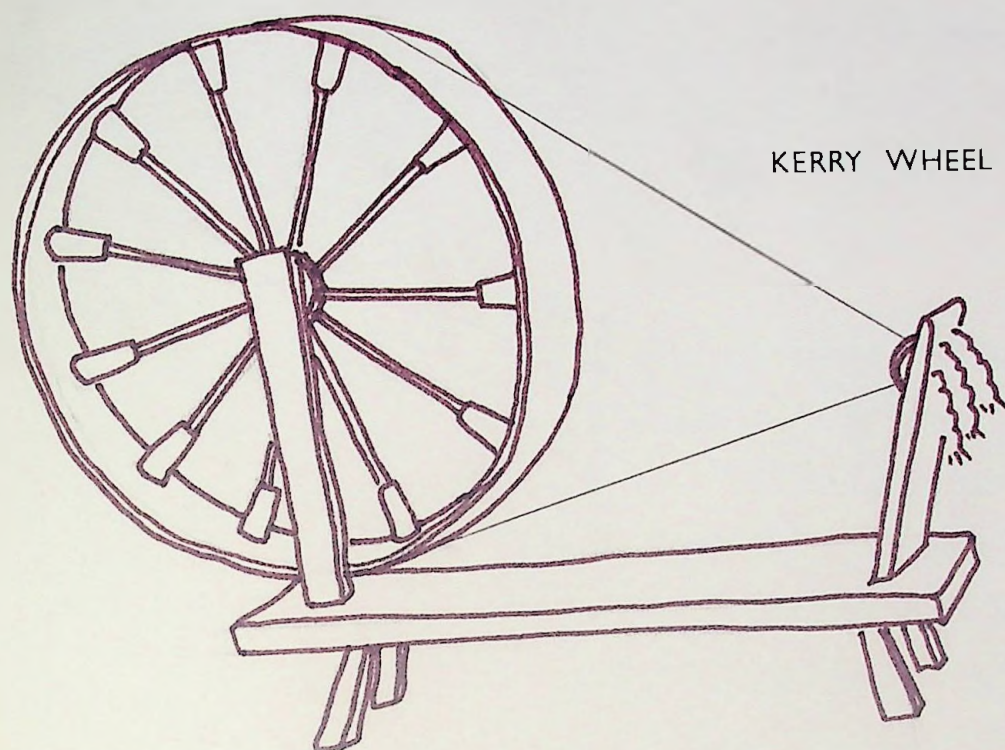
"It was a very rare occasion indeed that anybody worked till twelve o'clock, as then the fairies got busy and any mischief might happen to the wool. In the case of spinning, the belt was always removed off the wheel in case the 'little people' might be tempted to use it."

Lillian Mitchell.<sup>8</sup>

Also with the spinning of wool many tales abound; (two long quotations from Irish Spinning, Dyeing and Weaving by Lillian Mitchell pg 57 and 58 beginning: "It was this woman who had a great pile of spinning to do ... but she never worked beyond twelve o'clock after that.")<sup>9</sup>.

None the less for the women spinning was a pleasant change of occupation from the monotonous preparation of the fleeces. Spinning, in its most literal sense, meant the teasing out and twisting of the carded





TREADLE WHEEL:

DONEGAL

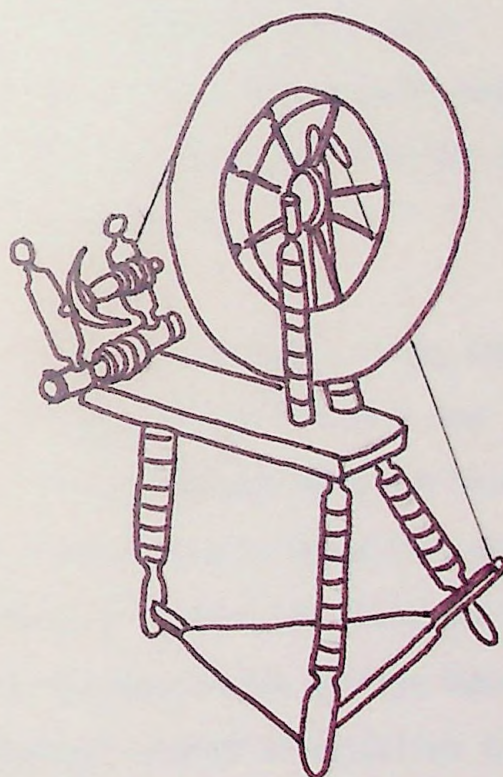


Fig. 3 Spinning Wheels

wool ringlets into yarn a practice requiring a high degree of skill and practice. For at this stage, spinning had graduated from the early simple implements (spindles weighted with whorls of bone or stone - Audrey Henshall,<sup>10</sup> Textiles and Weaving Appliances in Prehistoric Britain) to the characteristic wheel, a development universal in method but differing in design according to its origins.

Taking the 'rollags' of wool prepared through carding the spinner would hold it tightly in the right hand while feeding it between the fingers of the left hand onto the pirn (or bobbin) of the wheel. The left hand thus controlling the twist and evenness of the thread learned through endless practise. In Lillian Mitchell's book<sup>11</sup> she describes the spinning method thus: "Catch the thread again at the point of the spindle and with finger and thumb, draw out the small unevenness that is there. Then, turn the rim quickly, holding the thread near the spindle. Bruise your thumb on it, and work up the thread (using pressure) from spindle point to your shoulder level. Having made a skin on the thread, reverse the wheel and wind the finished thread evenly on to the spindle."

The weavers work began with the warping of the cloth. Using the spun thread, stretching then round pegs that projected from the wall and arranging them in a sequence of colours that would determine the final design or pattern. The warp is the vertical thread in tweed that dictates the length of a piece of cloth, the number of threads per inch, and the width; twenty-eight to thirty inches is the span of the average human arm, and this was the measure used by the Donegal weavers to establish the width of their tweeds. The weaver needed to be a highly skilled and practised person, sensitive to warp tension, an essential quality in the production of even fabric and able to concentrate totally on manual dexterity and the quick spotting of broken threads. All this plus an intuitive sense of colour combined to produce a fine cloth. It can be seen then that the



weaver was indeed a craftsman in whose work was reflected the individuality and tenor of the man who worked it.

The finished piece produced entirely by hand had all the evenness and perfection associated with mechanical devices but with all the added charm and aesthetic qualities expected of the human factor.

The last process was again communal and best described by Lillian Mitchell in her piece on 'thickening': 12.

"Any craftsman working with yarn should know the importance of the little scales which can be seen under a microscope along each separate fibre. These only entangle when spinning but are most important in the finishing. Fleece or yarn are put into hot, soapy water, and given pressure, these scales lock firmly together making a firm piece of cloth which will keep its shape and give good wear."

So after drying along the long stone walls surrounding their cottages, the length of tweed all of seventy yards to the bale was ready for market or personal use.

That was in 1900, it took an entire family, with the help of neighbours, one month to dye, spin, weave and finish one length (70 yards) of tweed; today it takes one week to produce two such lengths. Man's mechanical ingenuity has removed much of the heavy labour attached to the weaver's work; time and motion studies have done away with many of the outmoded and impractical (and intriguing) methods of preparation and finishing. But despite the modern processing the woollen fabric still has its roots deeply embedded in the traditional method of the past.



## Inventions and Inventors

It can be seen in the above chapter that in Ireland the weaving process and its many preparations were done almost entirely by hand in a wholly traditional manner and in almost complete ignorance of any mechanical innovation. However it would be wrong to begin a chapter on the development of the powered industry without at least a brief resume of the major inventions and inventors who shaped the industry of today.

1516: Leonardo da Vinci invented the spinning flyer, considered to be the first continuous movement in textile history.

1533: A citizen of Brunswick, Germany, Johann Surgen, a wood carver by trade, invented the so called 'bobbing-wheel' also known as the Saxony Wheel (a regular spinning wheel with cranked axis on the large wheel, and an added treadle by which the spinner could rotate the spindle with one foot) the wheel improved the quality of yarn for hand loom weaving and produced it faster than previous models. Surgen received his ideas from sketches by Leonardo da Vinci.

1607 - 1831: Saw the beginning of the industrial revolution which was to quicken the pace of textile development with an amazing number of new inventions, steam power replacing the hand and horse.

1733: John Kay, England invented the fly shuttle.

1737: John Wyatt and Lewis Paul, England invented drawing rollers to draft fibres so that spinning of yarn would be possible by machine.

1748: Wyatt and Paul invented the revolving cylinder later to become an essential part of a carding machine.

Daniel Bourn, England, obtained a patent No. 268 for a carding machine (he owned a cotton mill and it is said his carder was inspired by the need to feed a spindle machine invented in 1738 by Paul.

1760: Robert Kay, son of John Kay, invented the dropbox loom.

1767: John Hargreaves invented the spinning jenny, after his wife, drawing rovings was done on the machine by means of the carriage on the frame.

1769: Sir Richard Arkwright invented the spinning frame which did its drawing by means of rollers on the frame. Jedediah Strutt and Samuel Need were his partners in the venture and power was supplied by horses.

1772: John Lee invented the feeder device for carding frames.

1774: Edmund Cartwright invented the power loom and comber frame.

1775: Arkwright invented the coiler can attachment for the carding machine and the flyer for slubbing and roving.

1779: Samuel Cropton invented the mule spinning frame which was a combination of ideas derived from the spinning jenny of Hargreaves and the spinning frame of Arkwright. Drawing of fibres was done by the carriage idea of Hargreaves, and the roller plan of Arkwright, thus the name mule, a hybrid. Mule-spinning still exists today.

1782: the Watt steam engine appeared on the market.

1785: Edmund Cartwright received a second set of patents for the power loom. He also invented the warp stop motion for the loom. Cartwright's loom was equipped with a vertical warp.

Steam was first used as the source of power for the textile industry.

1800: Robert Miller of Glasgow invented a power loom.

1801: Joseph M. Jacquard, after ten years of intensive work, produced a loom on which it was possible to produce an intricate pattern in the weave by the control at every end. Napoleon gave him a pension for life and the machine was first seen at the Paris exhibition of 1801.

1805: Power looms first successfully used in England.

1828: The appearance of the first Jacquard loom.

1850: The British woollen and worsted industry was fully mechanized and capable of competing with the evergrowing cotton cloth industry.

1853: Holden and Lister, England, devised the square motion combing



machine which Lister later improved and today the machine is known by the name alone.

1889: The first fully automatic loom was completed by James H. Northrop. It was the first commercial loom and the 'last word' at the time.

1930: The first Draper high speed loom is invented. Loom speed increases by 20%.

#### Hand versus Power: The Power loom process

The great atmosphere and ceremony associated with the preparation and weaving of the handspun fabric have slowly given way in favour of the efficiency and technical potential of the power loom industry. The processes involved remain very much the same but the inventions discussed in previous chapters have found themselves a permanent place in the production of fabrics prepared and woven entirely by mechanical processes. It has been found that this kind of production too has its own brand of aesthetic quality as seen in any woven garment of today.

In modern industry from the time raw wool enters the mill until it emerges as cloth it may undergo seventy special handling and processing treatments. In the woollen mills the basic steps are as follows:-

Step 1: Firstly, the wool is sorted or graded by hand. This is an experienced job as up to six qualities of wool can be sorted from one fleece, starting with the finest 'neck' wool to the course wool at the tail.

Step 2: Scouring, or the removal of dirt through washing prepares the wool for dyeing.

Step 3: Wool 'tops' are dyed and blended to attain any required shade. This is known as stock dyeing and is the first opportunity for dyeing. In all there are three and the position which it occupies in



Left—Dyeing the raw wool for making tweeds in the Scottish islands

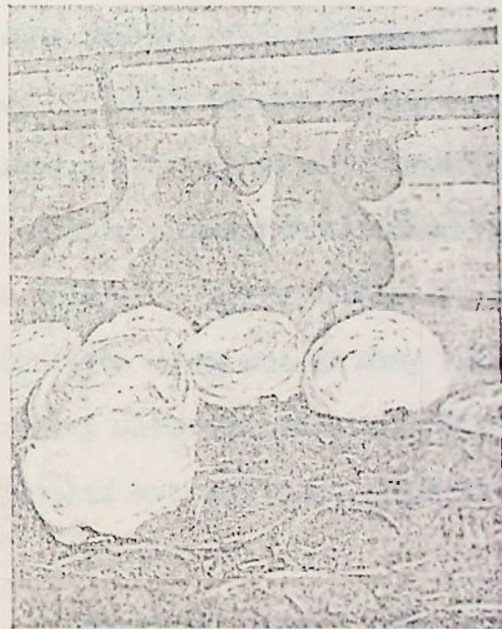


Below—Carded slivers for mixture shades are dyed in these huge vats which hold 500 lb. of wool and 700 gallons of water



Above—Loose wool dyeing; wool being dyed before carding and spinning

Below—Worsted tops being prepared for dyeing



*twenty-three*

Fig. 4

Preparation for weaving -  
cottage industry style



the cycle is denoted by its name.

Step 4: So ends the preparation of the raw fleece and now the dyed wool is carded. Modern carding machines, rotary drums covered with fine wire brushes, open the fibres, disentangle and produce a homogenous mix of various coloured tops where such a mix is required to achieve a difficult shade (a most thorough mix is possible with this method). The finely combed fibres are then rolled into 'rovings' ready for spinning.

Step 5: These 'rovings' or 'rollags' of small wool portions assist when the fibres are being drawn out and twisted into continuous strands, in other words spun into yarn. The yarn is wound onto bobbins while workers known as 'piecers' mend broken threads and empty the machine when the 'bobbins' or 'pirns' are full. (If dyed at this stage, the process is called 'yarn dyeing').

Step 6: The yarns produced are conditioned, steam pressure removes kinks and is in general primed to ensure smooth, efficient weaving.

Step 7 and Step 8: After beaming the yarns to specifications for colour and yarn type from prepared patterns, the yarns are drawn through 'wire heddles' set in harnesses. It is this setting which determines weave pattern and it is here that the designers fabric concept is realised.

Step 9: The yarns are woven into cloth using one of many types of power loom with all the speed and accuracy which mechanisation allows. The production process is far from finished but the basic cloth has been produced.

It can be noticed from the above account that modern cloth manufacture still owes much to the human factor. Each process no matter how mechanised is not only tended but very definitely regulated by the operator on the spot, so far mechanisation has only speeded up the process not revolutionised it. But in today's industry speed is of the essence and has allowed weaving to become as viable a proposition as it is today.

Finishing off the woven cloth usually fulfills a double need. Most processes are very necessary for the durability and purposeful nature of the finished article but often such processes produce a very desirable appearance and texture at one and the same time.

Step 10: After piece dyeing; if required at this stage, the cloth is closely scrutinised. Sophisticated x-ray processes help with the location of defects which if present lead to

Perching: the cloth is literally perched on high frames and the defects chalk marked.

Burling: Knots, loose threads, slubs (etc.) are finished off and trimmed until invisible.

Mending: darning of larger holes or overlooked threads.

Step 11: The cloth is sent for fulling (or milling). Often certain mills specialise in this important process and take in out-worker's cloth for a fixed rate. Fulling is the process by which cloth, through the application of heat, moisture, friction and pressure, is shrunk considerably in both width and length. Such shrinkage is allowed for in original weaving widths. The fibres are compressed and lose their former open-weave appearance. This essential operation equips the cloth for a hardy life.

Step 12: Yet more washing, scouring and rinsing follows to remove all impurities and dirt picked up during previous processes. Natural oils are also removed as these might interfere with the application of any subsequent functional treatment finishes such as waterproofing.

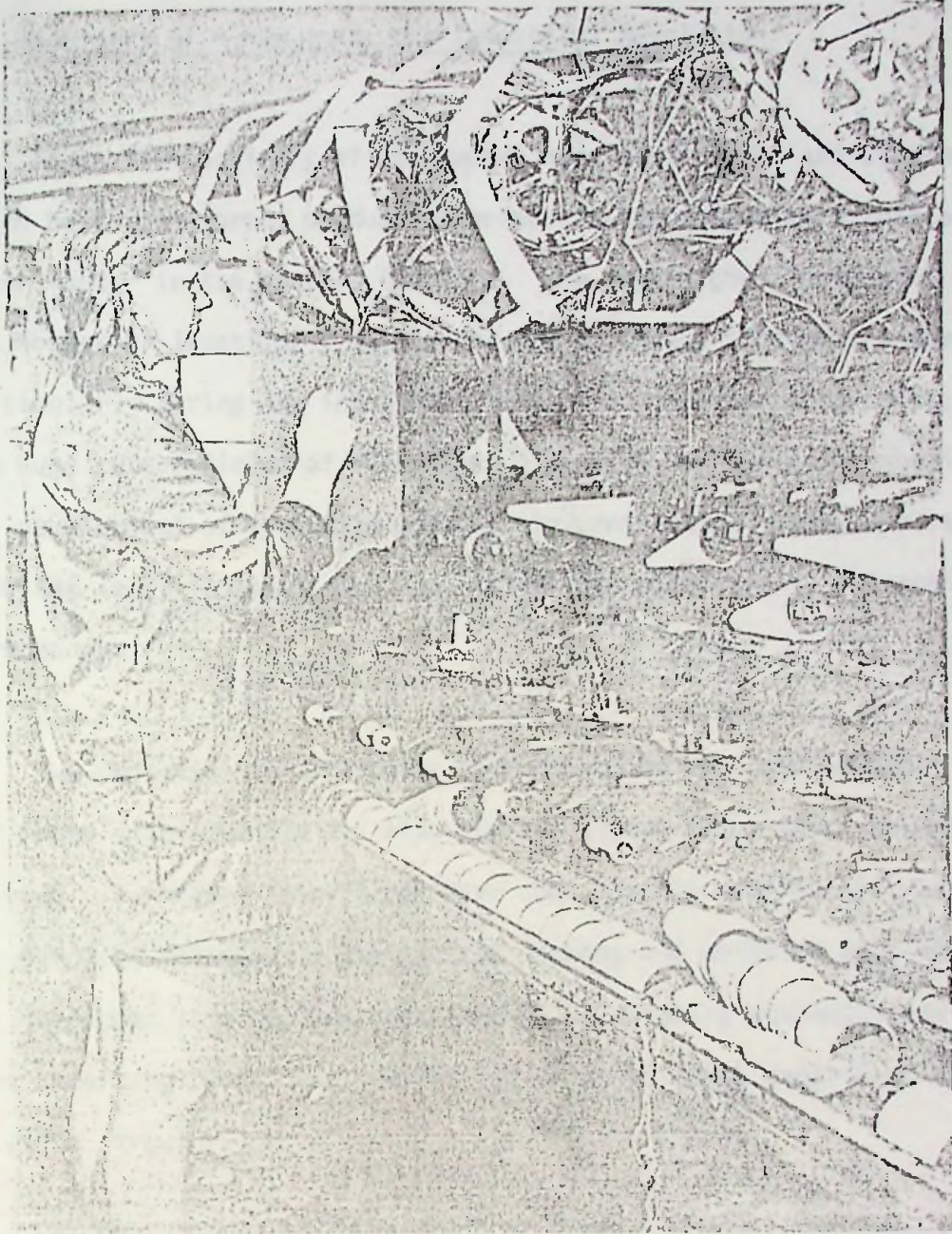
Step 13: The cloth is then dried and straightened on huge heated rollers to remove unsightly wrinkles. Before final moistening and pressing on a dewing machine, any nap or pile weave is uniformly cut to length.

All the above processes are necessary to the production of high quality, serviceable cloth and most were known and practised since the early days of weaving. The main advantage today being the ability to be in full control of the effect achieved. When dealing with wool cloth,



heat and moisture can as easily distort as reshape. Modern methods reduce the possibility of such distortion and subsequent financial loss.

Here we have listed basic mechanised processes and possible effects, further discussion of improvements in method, material, knowledge, and aesthetic finish etc. can be found in chapter VI on wool and synthetic discovery.



*Modern spinning wheels*

51

**Fig. 5**



## The machinery of a new age: the Industrial Revolution

It is the machinery of the modern age, their speed and accuracy, which have transformed production processes and output more than any other factor in the textile industry. The saying goes 'Necessity is the Mother of Invention', well every new discovery through the ages, particularly during the industrial revolution, whether geographic; the huge cotton fields of the newly cultivated New World, or chemical; the development of synthetic possibility, reflected in many spheres of life not least in textiles. The innovations particularly in machinery were many.

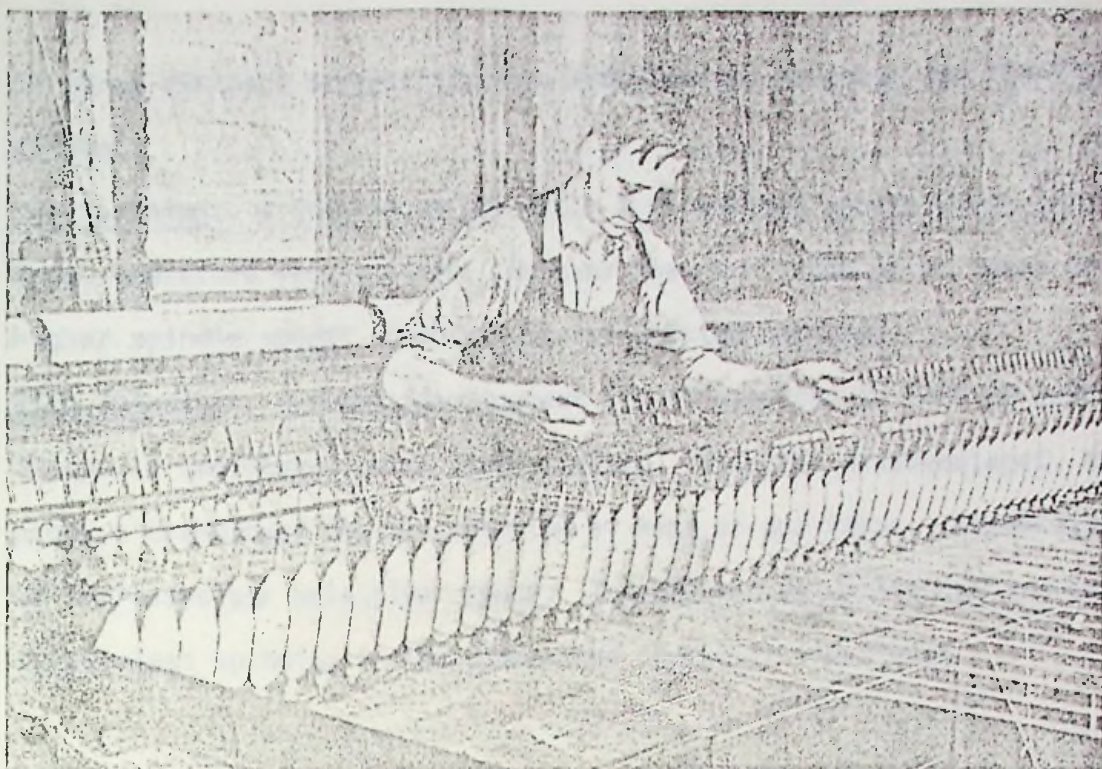
Two processes in particular have undergone most development and these significantly are also the two oldest processes: spinning and weaving. Technical innovations have continuously complicated what were the simplest methods. Spinning from 'string and weighted bone whorls'<sup>13</sup> has developed into no less than four major spinning methods; weaving from a darning board to a bewildering array of looms capable of any type of weave structure.

As has been seen in our chronology of invention, four Englishmen Paul, Arkwright, Hargreaves and Crompton, are responsible for the basic inventions upon which all modern spinning is achieved. The principles they developed have not changed with the years and today the four main spinning methods read:

Flyer Spindle: This runs at a low speed and produces a quite smooth yarn, free of fuzzy 'beard'. However low production and the strain imposed on the yarn by bobbin drag constitute the main disadvantages of this type.

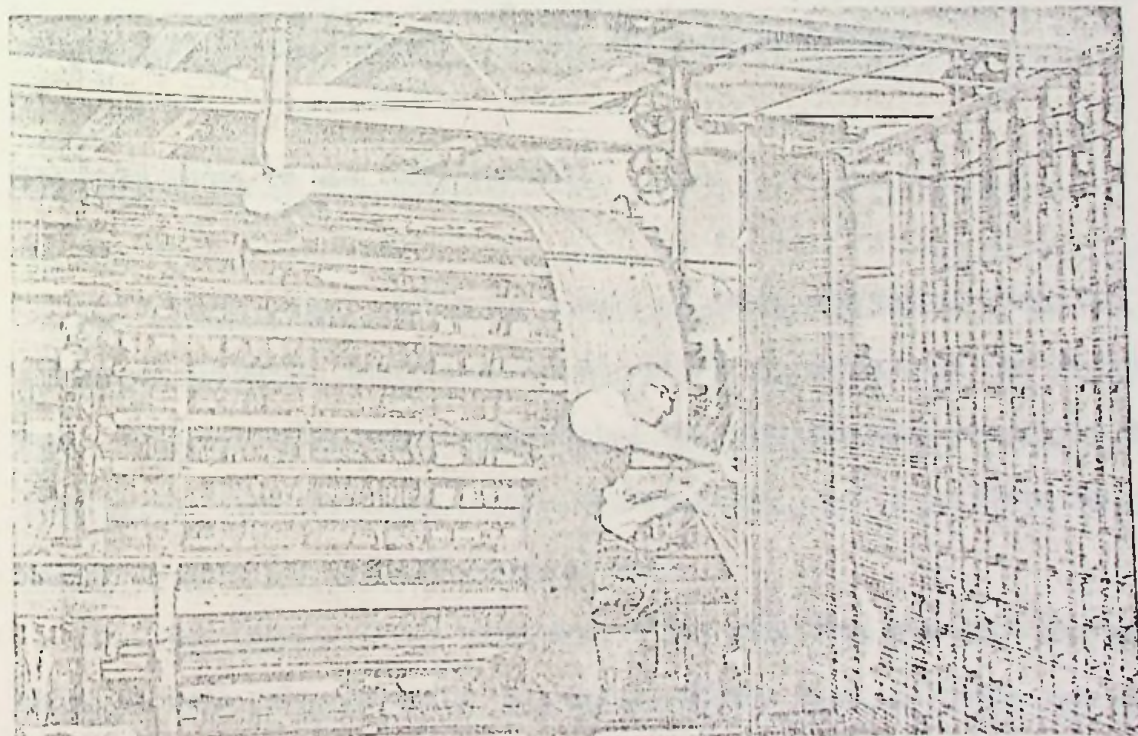
Mule Spinning: Increased production produces a yarn of extreme fineness with few twists per inch but the process is not continuous and consists





Hundreds of threads are being spun on this mule spinning machine. The moving carriage draws out the rovings, the twist is given which binds the fibres together, and the threads are then wound onto bobbins

Fig. 6



Warping—an important process in the making of cloth. All the hundreds of threads which will become the warp of the fabric are wound carefully onto the "balloon" prior to weaving.

Fig. 7



of three distinct stages, drafting and drawing, twisting and finally winding.

Cap Spinning: a continuous process. A mechanised bobbin gives little drag, therefore less tension. However the yarn tends to be fuzzy with higher spindle speeds (favoured of the worsted process).

Ring Spinning: A recent development (first patented in 1828 by John Thorpe) a continuous, high speed process. With few disadvantages, this process is employed for the spinning of most of our yarns. Production can be increased per unit floor space. This method is challenged now by spindleless spinning in the cotton and synthetic industries.

The Kay family, father and son, contributed most in the early days of loom mechanisation with the advent of the fly shuttle and drop box loom (which made it possible for the weaver to manipulate several shuttles at once). While Joseph-Marie Jacquard (1752 - 1834) supplied the biggest single jump to the industry with his multi-pattern looms.

The main looms in use today include:

1. Plain Looms: Built for simple or plain weaving of cloth but with a special automatic shuttle device to refill the shuttle as its yarn runs out. This naturally greatly diminishes the time involved servicing the loom by half and therefore increases production. It is possible for the weaver to care for up to 48 looms at once.

2. Box Looms: These looms are fitted with drop box devices featuring spindles with coloured wools ie a multi-spindle loom, allowing for checks and plaid pattern where striping is already incorporated in the warp. The timing of particular colours can be ordered to conform with any pattern instruction.

3. Dobby: A more simple version of the Jacquard loom, where fancy



materials requiring the separate lifting of many heddles is required. This end is achieved by a chain of metal plates with projections which control the lifting plan. Best used for small, fancy, geometrical or symmetrical figuring and design.

4. Double Dobby: A loom combining a more convenient arrangement of bulky chain instructions as above.

5. Jacquard Loom: Provides for the lifting of individual warp ends. Perforated cards and connecting needles on a cylinder head allow for this process which can produce highly complex weave structures or figured fabrics.

6. Leno or Doup Loom: a loom which caters for intricate fancy effect in the warp weave twisting and crossover of warp threads produces beautiful skeletal effects. Most often used in novelty curtain and dress fabrics.

7. Lappet Loom: Uses an extra warp to produce small fancy effect in the cloth. Producing what could be called a double faced fabric.

As the weaving industry felt the competitive pressures of other textile fields, particularly knitting, creeping up. It responded with drastic action in producing the shuttleless loom. Air - or water - jet propelled wefts allow greater speed and better economy than ever before. However the yarns used must be non-absorbent in nature and because of this the wonder innovation of the mid 1940's remains dominated by the more dependable and continually adapted fly-shuttle.

Most of the apparatus mentioned are at present in use in mills all over Ireland. The types above produce cloths of various weights and patterns but experimentation in fibres and yarn textures encourages design in cloth styles to change as rapidly as current fashions. The innovators of today then lose no time in adjusting or inventing machinery capable of dealing

with such fashion tastes and indeed making a profit from them.



## PART II CHAPTER III - RAW MATERIALS AND PRODUCTS

- Contents:
1. The Raw Material - Wool in Ireland
  2. Cloth types: Donegal, Harris,  
Bannockburn, Tartan ...
  3. Dyes, Dying and Dyestuff - in tradition
  4. A Wealth of Regional Differences

## PART II

### CHAPTER III Raw Materials and Products

As has been shown wool is the traditional raw material used in Irish tweed manufacture and this has been the case since earliest times. This versatile fibre, the protective coating of the sheep gives natural insulation against both heat and cold and its added qualities of unique absorption (wool can absorb 30% of its own weight without feeling damp) make it the ideal choice for todays weavers, as it was for their ancestors. Being such hardy animals, easy and cheap to keep, adaptable to almost any location and with dual purpose qualities of food and clothing provision, the sheep proved itself a worthy proposition.

Doctor David Mitchell writes of sheep:

"Feeding ceaselessly on vegetation often of the poorest kind - heather, rushes, and bent or asparto grasses - they can not only conceive, deliver and suckle their lambs, but in addition produce yearly clip of seven or more pounds of wool - just enough to make a man's suit."<sup>14</sup>.

In 'A remembrance of times past' an extract from Lillian Mitchell's book:<sup>15</sup>.

"My old friend Maggie Toolis, told me that she remembered a time when Sandybanks were covered in sheep and every man in the village, even the poorest could boast of a few."

#### The Raw Material - Wool in Ireland

The bulk of Irish wool is of the crossbred type but certain areas favoured particular breeds and so begins the story of the distinctive tweed types and the wools which have become their characteristic stamp.



Five main breed types concern Ireland:

Galway: The bulk of Irish wool comes from this breed which originates in County Galway, spreading to the Midland districts. Managing on rough grazing, the fleece is of a medium coarseness, ideal for tweed production and making up into skirts, jackets, cushions, curtains and knee rugs (etc.). It is also said to have been used for friezes. (A cloth important in the production of very early clothing. A definition by Wil Minderman-Poel<sup>16</sup> written in 1977 describes it thus:-

"Fries. A heavy woollen fibre with a rough irregular nap. Originally made in Holland and Ireland, and in the sixteenth century especially used as clothing for the poor people. In the early middle ages 'Firsones' were probably Flemish woollens which were traded by Friesean tradesmen. Friesland is a county of Holland. Nowadays Fries is a woollen twill fabricated with a lot of re-used wool and a rough nap."

Today Providence Woollen Mills, Foxford, Co. Mayo uses Galway fleece exclusively and has built an international reputation for their rugs and blankets.

Cheviot: Originally confined mainly to areas around Wicklow but more wide spread recently, the fleece being most suitable in the production of heavy tweeds best known to Hill and Sons of Lucan, Co. Dublin (a more detailed account of whose production can be found in the preceeding chapters).

Blackface: Here is a breed with exceptionally Irish appeal. It is the dominant breed in the mountainous areas of Donegal to the Kerry, Knockmealdown and Galtee mountain ranges. This strong, course wool is beautifully used in the design of tweeds from Donegal and Aran knitted goods. The softness and draping qualities of these garments is due to the inherent desirable characteristics of wool produced in this rugged environment.



Blackface Sheep

*Wool Council of Ireland***Fig. 8**

Galway Sheep

*Wool Council of Ireland***Fig. 9**



Suffolk (or Down): a fine wool tweed often used in the worsted trade. A challenge for the expert weaver only and best used in fine clothing, cot blankets , scarves (etc.) (this particular breed was not available to the medieval weaver, as good cultivated pasture is essential to quality wool production).

Crossbreds: Crossbred type wools are used where the qualities desired are not present in any one breed, so hybrid wools are 'made to order' so to speak, to fulfil the desired purpose to which the wool is put. For example Greyface and Halfbred sheep, which are offshoots of the Blackface mountain and Cheviot breed, are crossbred to produce wools used mainly in the heavy woollen and carpet sectors of the industry.

The evolution and distribution of these types depends mainly on natural suitability to climate and adaptability to geographical situation as it is an established fact that such factors determine wool quality.

As speculated by Lillian Mitchell in her handbook 'The wonderful work of the weaver':<sup>17</sup>

"It is a curious fact that, generally speaking, very fine wool is only produced by sheep living in countries with a hot climate and very sparse vegetation. Long coarse wool is found in the temperate regions where the vegetation is lush. If merino sheep were brought to Ireland and fed on Irish pastures, their wool would very soon become considerably coarser. Similarly, Irish sheep sent to live in the deserts of Australia would produce finer wool if, in fact, they could survive at all."

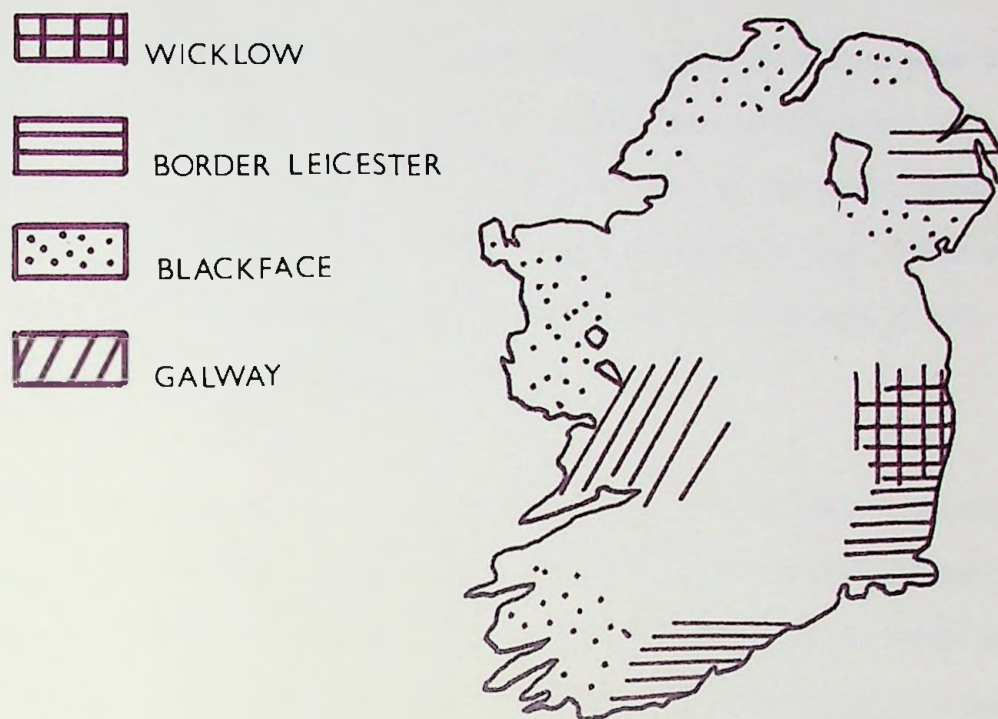


Fig. 10 Distribution of sheep breeds in Ireland.

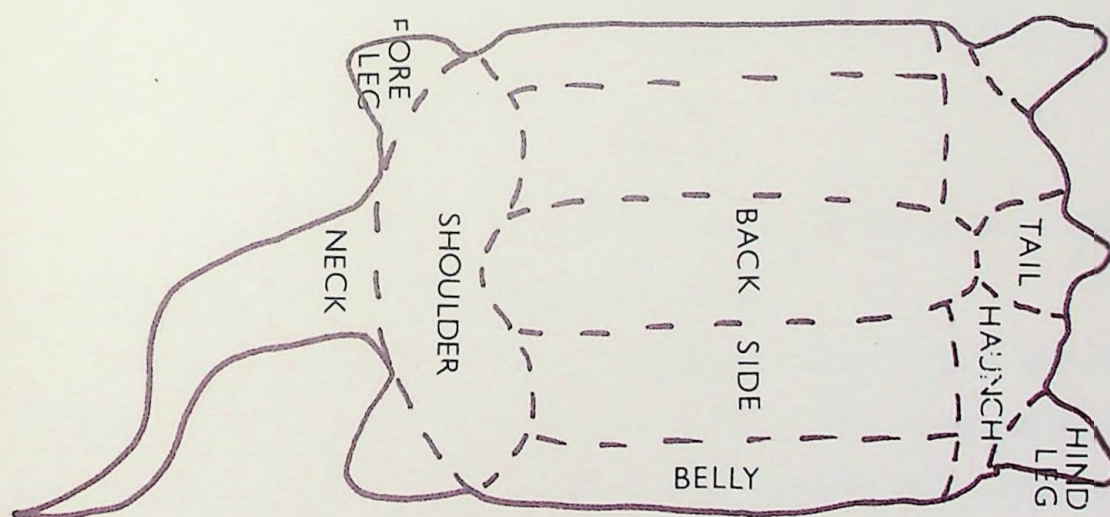


Fig. 11 Diagram of wool grades in a fleece



## Cloth types

The name 'tweed' includes a very large range of fabrics, made in various weaves, weights and qualities. Tweed textures are open and elastic in nature while all grades are met with from the very coarse homespun to the finest saxony cloths. Some tweeds are even named after the district in which they are made, whilst others are known by the possession of certain characteristics.

The term 'homespun' is used extensively to define coarse fabrics of a tweed aspect. True homespun is made locally by the village and farming population of the Western Highlands of Scotland, Ireland and other areas of Britain. It has been declared in the Law Courts that the description 'home-spun' "can only be applied to cloth the wool of which is handspun and woven on handlooms at home". These true homespun are made in narrow widths usually about 28" wide, as the handlooms on which they are woven are seldom, for convenience in weaving, more than 30" or so wide. Imitation homespun, however, are woven on the usual (double) width by the ordinary methods of manufacture.

However a reference to the fabric tweed can be found in 'The Encyclopaedia of Textiles' and reads thus:<sup>18</sup>

"Tweed was first made on handlooms in the vicinity of the Tweed River which separates Scotland from England. This very popular suiting and coating material is now made on power looms as well as hand. The latter type is much in demand and commands a good price. Two or more colours feature the goods; and while some of the fabrics are made of plain weave - the homespun weave - most of the product is made on a 2-up and 2-down Twill design.

Tweed was originally known as twill cloth, meaning a cloth with a pronounced diagonal pattern the produce of the twill weave. However a story is told of a merchant who mistakenly read 'tweed' for 'twill' or 'tweel', a label on a bale of fabric and the name has stuck to this distinctive woollen cloth ever since through a mistake which was never rectified.<sup>19</sup>

It would be unfair to define too strictly the design and texture of Donegal tweed, or indeed any tweed of Irish or other origin. The choice in design and texture is too wide but perhaps the most characteristic patterns associated with the heavier tweeds are houndstooth, herringbone, strong checks, brilliant plaids, blazer stripes and colour 'flecks'. Colour too is not necessarily conformist to tradition. Lightweight tweeds are brilliantly beautiful when woven into 'Mondrian' stripes of strong toning or contrasting colour or light 'gingham' checks in muted tones of earth, sea and sky or palest pastel. Textures range from the finest tweeds with a touch like silk, basket weaves with the look and feel of lace, mohair tweeds like candy floss to curly-faced tweeds with the feel of Afghan wool, ridged ottoman ribs, hairy stable-type tweeds and of course the 'knubbly' salt and pepper tweeds beloved of brogue-wearing country folk.

However for those with a taste for a more factual description of the 'Donegal tweed' cloth, a good reference book 'Textiles for Tailors'<sup>20</sup> adequately defines the elusive qualities of the cloth:

"Donegal tweed: A fabric of cheviot quality woven either in the plain or the two and two twill. The warp yarns are usually spun from natural coloured wool and the weft yarns from fibres of different colours dyed before spinning. The cloth has excellent tensile strength and good elasticity; the surface fibres are usually levelled by cutting in the finishing routine."



Another cloth immediately called to mind when speaking of Irish handwovens is Bainin. However it must be explained that while this cloth is sold in all three weights, light to heavy, and often seen screen or block-printed by hand, usually in a bold motif or design of Celtic origin, it is not strictly a fabric type and therefore is of little interest to us in a study of weaving. As the name bainin, given to this popular cream coloured wool fabric, means in itself 'white', it is therefore inaccurately used in statements such as "the 'red' bainin coat" - a complete contradiction in terms.

Having made that distinction and although chiefly concerned with cloth of Irish origin, I feel it necessary and interesting to list for the sake of comparison other classic tweed types. These unfortunately fall mainly under a British heading.

The chief rival of Donegal tweed, mainly due to its somewhat similar handle and appearance, is Harris tweed.

Harris tweeds: are fabrics made from pure virgin wool produced in Scotland, dyed and finished in the Outer Hebrides and handwoven by the islanders, in their own homes, on the islands of Lewis, Harris, Uist and Barra.

Originally, hand-spun yarn was always used, the cording and spinning being done by the women on long winter evenings by the fireside. Later in 1911, the Harris tweed trade mark was introduced, requiring that all processes, with the exception of carding, be done by hand. However, due to ever increasing demand for the Harris tweed it became necessary to have ready spun yarn brought in from the mainland mills.

Today, a form of Harris is woven from these machine-spun yarns, but the term 'handspun' is still used in the case of those tweed lengths genuinely made entirely from handspun yarns. These yarns are thick and fibrous, and the fabric is made in the plain or simple twill weaves. Like 'Donegal', Harris tweeds have all the characteristics of a good cheviot fabric; elasticity, fibrous surface, strength and good colour tones.

It was the natural dye crotal and the drying of the finished lengths of yarn before the peat fires that gave the fabric its characteristic colour and aroma. Today however a synthetic alternative has replaced the now scarce crotal dyes and while this manages to maintain the colouring it is inevitable that some of the former atmosphere is lost.

Scotland, Bannockburn: First made as a cheviot style material in the now familiar 2-up, 2-down weave. A twisting of different coloured yarns provided a mottled effect. Always a staple in the garment trade, the fabric at times is a leader in both men's and women's wear suiting and light topcoating. Similar to both Donegal and Harris tweeds, the fabric was interestingly named after a famous battle fought in June 1314 when the Scots defeated the English.

Before passing from Scotland, a brief mention of a cloth whose pattern and colour have long held an appeal for the Irish nature, Tartan, what must have been one of the first fashion 'fads' of the Irish nation in the sixteenth century, originated from Spanish 'tiritana', a cloth with a small check. The Scottish Highlands have developed these coloured checks into their distinctive clan dress plaids. (Note: there are only a small number of true clan tartans, many others are merely a modern 'fancy' for 'Sunday traditionalists'. It should also be noted



that the tartan was indeed a 'dress' plaid for special occasions). Today a twill weave is used to make the plaids and tartans which are used in the manufacture of coats, kilts and shawls.

In the true sense of the word, 'tartan' is a pattern or design, while 'plaid' is a blanket-like mantle folded in several ways and joined at the shoulder with a brooch. The two words tartan and plaid are often used indiscriminately interchangeably.

So to summarise, we have three tweeds, Donegal, Harris and Bannockburn, all from various locations with their own history and tradition in making but all with almost identical basic structures and colouring.

## Dyes and Dyeing

### Tradition and distinction in dyes, dye stuffs, and the dyeing process:

The art of using dyes seems to have developed independantly, and been practised independantly, by different primitive peoples in almost every region of the earth. Their technique was simple, they roamed the woods and fields collecting known dye plants or roots which they then boiled in hot water. The range of colours they were able to achieve was limited: red, blue, yellow, green, brown and black with slight variations in shade and tone.

So states the 'Encyclopaedia of textiles' in its extensive chapter dealing with colour. Indeed in all civilizations colour seems to have played a major role, being used as a symbol or badge of distinction, rank etc. Many colours seem to have had universal distinction, however this could be traced to the ready availability of the source as illustrated by the use of the yellow dyestuff Saffron, obtained from the fall-flowering crocus, *Crocus Sativus*. Used by the Greeks and Romans the colour also has been traced to Persia, Mongolia, China and was indeed an official colour of Greece while used in Ireland as the garment colour of the lowest orders by the High King in the ninth century.

Even in such a small country as Ireland, the study of colour, its history and uses, can be a major and involved one. However judging from references in many documents for 'the preference for bright colours' shown by the ancient Irish a mention however brief is called for.

"The old Irish, like the Scottish Highlanders, had a great fondness for bright colour, and even in very early days seem to have possessed a highly developed colour sense and knowledge of dyeing. No less than fourteen different shades of colour are mentioned in a single passage



from Tain Bo Cuailnge in the book of Leinster."

H. F. McClintock, Old Irish Dress.<sup>21.</sup>

This observation is borne out by the beautiful illuminations of the Book of Kells, the Book of Mac Durnan and many other old manuscripts. The art of dyeing was well understood and the dyestuffs were not imported, they were home produced and considered of great importance. The people understood how to produce various shades by the mixture of different colours, and were well acquainted with the use of mordants to fix them. One of these was alum, a native mordant and the preparation process is described by Lilian Mitchell:<sup>22.</sup>

"In the cultivation of the dyeplant, men might take a part; but the rest of the process was considered the special work of the woman, so that men seldom assisted. Even the presence of men or boys looking on at the work was considered unlucky. Cloth was dyed in the piece, the wool being left of the natural colour till after weaving and fulling. But woollen cloth was often worn without being dyed at all."

It appears that there were two main stages in dyeing. The first concerned the application of a ground colour usually a reddish brown, by steeping or boiling the cloth with the twigs of the 'ruam' or alder. The second stage was the real dying where the cloth would be boiled with the chosen dyestuff.

Dyes were taken from every source possible and these include animals, insects, minerals, ores, plants, shells, lichens, and trees. Under these headings the result produced was:

Mordants: Alum and Chrome (Potassium dichromate, Bichromate of Potash). Processes for their application differ but both were used to to prepare and condition wool for the application of dyes.

### The Lichen Dyes:

These dyes are collected in the locality of the weaver and as such can be a means of tracing the origin of fabrics dyed in these areas.

*Parmelia omphalodes*: the crottle for dying in Co. Donegal. It can be gathered off the rock in July and August. In appearance it is a compact brown colour, a little like tobacco and imparts a tan brown colour to the fibres.

*Parmelia sextilis*: found near the sea in Connemara spreading over the rock like a greenish-yellow skin. Used by the country women for a brown colour.

*Ochrolechia* (formerly *Lecanora*) *tartarea* gives shades of red and crimson and can be collected in May and June.

Methods of lichen dyeing also differ. In Donegal the usual way to use lichen dye is to put alternate layers of fleece and lichen in the pot, with water and shimmer; while in Connemara, "for dyeing fleece or yarn put lichen in the pot, then get a muslin bag or any other thin material, put wool in and put more lichen on top, cover with water and boil with a fist of salt."

### Vegetable dyes:

**Madder:** In Ireland the plant, *Rubia peregrina* is found. Commonly used to produce a red colour.

**Weld:** *Reseda luteola* found in sandy and gravelly places. Picked



by the roots in June and July it gives the best and fastest yellow dye. The mordant used is significant: with alum - a lemon yellow; with chrome - an old gold.

Saffron: a dyestuff whose colour is famous by the same name. Mentioned widely in manuscripts of ancient Irish life, however there is some dispute as to the credibility of these quotations, not least due to the costly nature of the plant while being quoted as so commonly used.

Onion skins: For yellow or tan.

Broom: again for yellow.

Woad: In Irish glaisín (glasheen) a name given to the final stage of this well processed dyestuff. It gave a blue colour.

Black: from the sediment or deposits of the black soil found in bogs or pools, always containing iron which helped in the dyeing process.

#### Animal:

Purpura Lapillus: purple is obtained from this shellfish and is the most normal source for this colour. However it is known that a lichen can give this colouring and such a dyestuff was sold at markets in Dingle, Co. Kerry.

It is also known that certain dyestuffs were traded for overseas and allowed for the use of Indigo, to produce blue, which was commonly

used on Aran; and Cochineal, the crushed bodies of beetles found in Mexico, which gives a red colour.

All of these dyes were in common use from earliest times and as can be seen from the sources were ingenious and unexpected: lichens, trees, plants, shells, insects and soil.

### A Wealth of Regional Differences

For me, perhaps the most interesting aspect of this ancient tradition is the possibilities of identification through indigenous characteristics. It has long fascinated me, the research work undertaken by museum curators into the origins and dating of found items. The methods used are no less ingenious than the original craftsmen. I would like to pick out some of those 'tell-tale' signs which help document an item.

To begin with in Ireland, various counties claim certain dyes and dyeing methods as representative of their area. This practice is not unlike the Roman and ancient Irish tradition of rank representation by colour. Fortunately, for this study, the same areas still continue their tradition.

In Co. Kerry you may see somebody putting alternate layers of leaves of the Alder or 'Black Sally' tree and fleece into the dye pot. When simmered, this gives a brown dye which also prepares the fleece to absorb the next colour.

In Co. Donegal, the lichen dyes are mostly taken from *Parmelia Omphalades*, while in Connemara, *Saxatilis* is used for tan brown. Near Cashel, Co.



a Mrs. Cloherty still dyes heath, for a lemon yellow, crottle or lichen for brown, and the water lily roots for black.<sup>23.</sup>

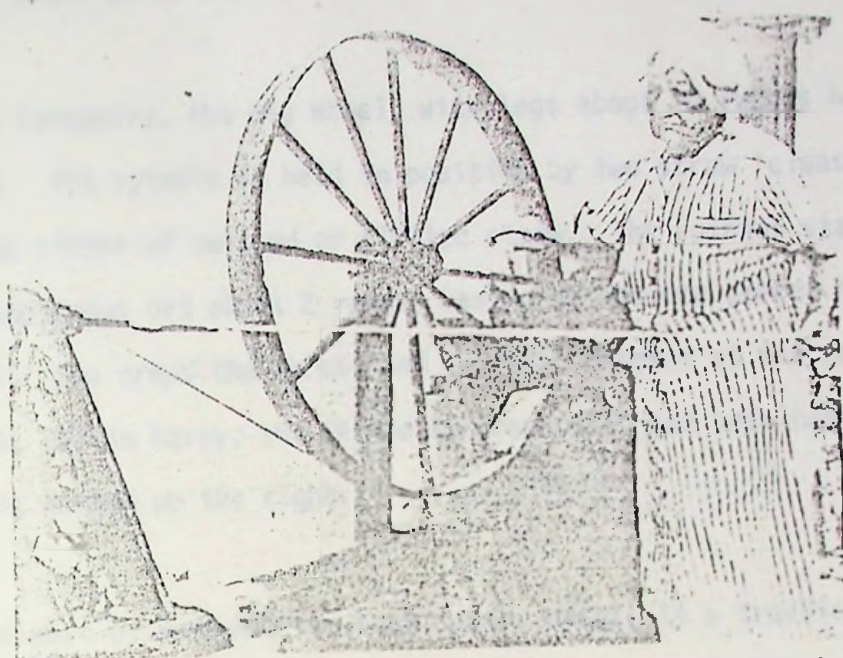
<sup>23.</sup>  
Mrs. Greene, Luish ree, Roundstone, got mud from the lake for a black dye. She said she got it in buckets and strained it before dyeing. Such sources are easily traced after chemical analysis.

### The Spinning Scene:

The spinning tradition holds many such secrets of a cloth's origin not only is the yarn actually spun with an inbuilt indication - the direction of spin is usually indicated by S or Z, the direction of the fibres in the thread being compared to the middle stroke of either letter. Such direction was often a matter of personal choice or tradition in certain areas - but spinning methods, utensils and folklore abound to help differentiate between areas of origin.

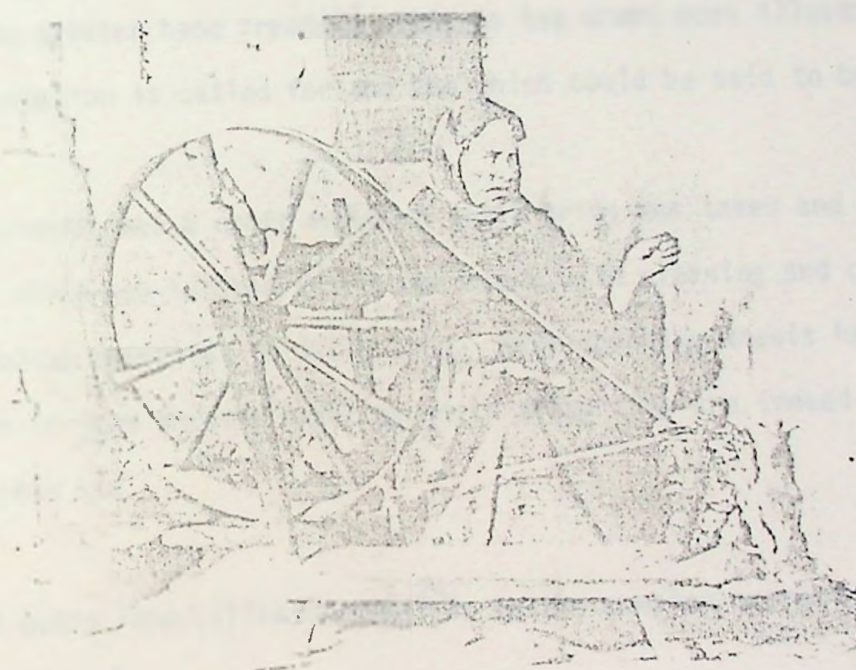
In Aran, the traditional Irish Crios is woven with the warp threads stretched between two chairs, making the length  $3\frac{1}{2}$  yards if it is to be worn by a man and 2 yards if it is for a woman. On Inishere, it is the custom to put two white threads on each outside selvedge edge, using many colours inbetween. No loom or mechanical device is used. Every second thread is attached by a thread to a small stick. For one shed, or opening, this stick is lifted, the other shed being obtained by the right thumb, working thread by thread across the width, which is about 3 inches. A man's crios is made a little wider than a woman's.

In Co. Kerry, a low type of big wheel is used, at which the woman sits. The spinner draws out the thread with the left hand, while turning the wheel with the right. When a length of thread is spun, it



Spinner on Big Wheel  
**Fig. 12**

*Evelyn Lyndsay*



Spinner on Blasko Island

*Thomas H. Mason*

**Fig. 13**



must be wound on to the spindle and the wheel restarted.

In Connemara, the Big Wheel, with legs about 10 inches high long, is used. The spindle is held in position by two straw 'cluasa', which are made either of twisted or plaited straw. The spinner stands at the wheel and draws out about 2 yards, having joined one carded roll to another. She drops the thread and catches it again at the point of the spindle. As in Kerry, the thread is drawn with the left hand while the wheel is turned up the right.

In part of Donegal, the most common wheel, is a treadle kind that is a wheel to which foot pedal or treadle has been fitted to allow the spinning greater hand freedom. This is the wheel most illustrated when a representation is called for and one which could be said to be automated.

Spinning was a craft in which great pride was taken and every female child was tutored in its use along with cleaning and cooking as an absolute essential in daily life. Many spinning wheels have survived and are in good working order as quite often they are indeed still in continuous use.

A quote from Lilian Mitchell<sup>24</sup> as to the complex operation spinning really was ...

"There are actually three different operations to be taken into account while spinning: the turning of the wheel, filling of the proach, and the drawing out of the roll, and while taking lessons from Mrs. O'Malley, I came to the conclusion that it must take a considerable amount of time and patience to be able to manage all three of them at the same time without damaging the wheel in any way."

## PART II CHAPTER IV The Social and Historical Context

It has been said that, through the ages man has satisfied a certain need, for individuality as a derivative of social, by the use of some clothing that is typical representative of any of his own culture.

### PART II CHAPTER IV

#### The Social and Historical Context.

- Contents:
1. A Question of Identity
  2. Promotion through Suppression
  3. The Effect of the Town System
  4. Dedicated Follower of Fashion
  5. The Irish Context
  6. The Celtic Revival



## PART II    CHAPTER IV    The Social and Historical Attitude

It has been seen that, through the ages man has satisfied a certain need, for individuality or a declaration of status, by the use of some clothing item or aspect recognisable by any of his own culture.

Fashion fulfilled many of man's emotional needs - 'needs created by political, social and economic stress. Fashion acted as a comforter, as a palliative, it might sometimes have been a weapon, but it certainly a defence as well. It was (and still is) in fact comparable to an armour against the blows of civilisation'.

The Changing Shape of Fashion through the Ages  
Jane Dormer. 25.

To illustrate the strength of feeling, the degree to which fashion was used as a tangible representative of a mental state brought about by a physical situation, a quote from Lillett Cunningham's - English Women's Clothing in the present century<sup>26</sup>.

"Young women sought by every means possible to obliterate their feminine outline and assume that of the immature male; due to the 1914/18 war in Flanders, many men were killed which resulted in the glorification of male youth and a million surplus women."

As a result of the unfavourable economic climate and vast unemployment the average man, while wanting to marry, was put off by the idea of raising children in such an environment so the anti-maternal school boy shaped girl became his ideal. Women flattened their breasts, bottoms and disguised their waists. Later in 1925 in accordance with receding war memories and economic improvement, women's clothes became gradually more feminine especially for evening wear.

Such was the power of fashion, long before it became a dictator it acted as an interpreter. In this paper we are concerned with the Irish clothing scene and particularly the woollen end; I have introduced the chapter thus to impress the place given to fashion in social history. This is important as I intend to discuss the attitudes towards costume, dress and even the cloths worn, mainly in a direct or related Irish context.

### A question of identity

It has already been stated that in early times the civilisation of the Irish High Kings possessed an advanced hierarchical system in which costume colouring was used to denote status, it was in this way that fashion became a badge of identity. Varying in implication whether seen within the clan context or in a larger cosmopolitan setting, as with the old Irish dress of the chieftains. This use of clothing as a representative attached an importance to the costume which it did not of itself possess.

In previous chapters we have seen how various areas were noted for their production of a particular stype in cloth; particularly woven cloth with all its inherent characteristics, setting it apart as an easily recognisable area fabric (eg District Checks - Our District Checks. Es Harrison) with all the tradition that implies. It is these implications and attitudes which are dealt with in this section.

The identity and pride of the people was tied up in every aspect of their lives and reflected in what they produced, which was usually handwoven tweed in Ireland.

"Most of the everyday materials such as flannel, frize and blanket cloth were woven locally, and Twill, Herringbone and diamond patterns were



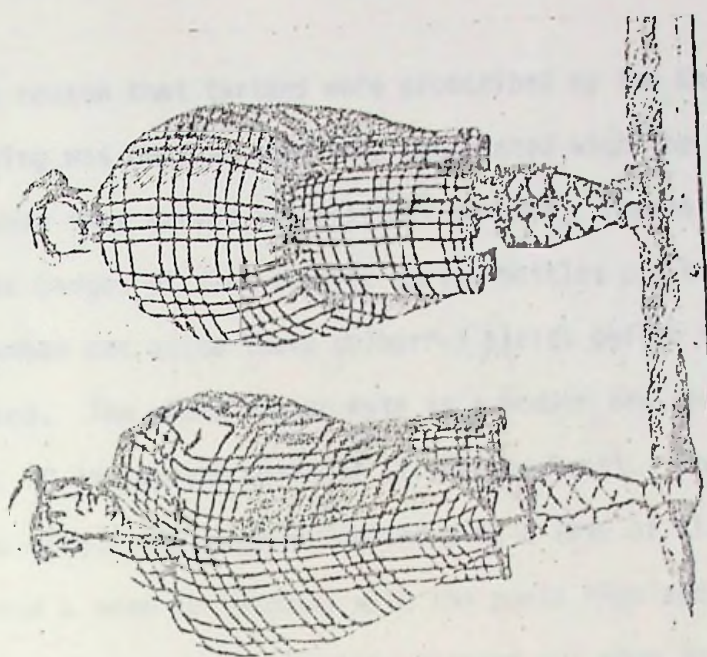
all in demand. In May and June the journeymen-tailors and 'Manty' workers were hard at work making up those materials into garments for 'the people going away'. Much the same thing happens at the present time, only the tailors no longer work in the houses as they did long ago, but John O'Malley the tailor in Keel, once the turf cutting is finished until late in June is always kept busy providing outfits for migratory workers, both men and women". Irish Spinning, Dyeing and Weaving.<sup>27</sup>

### Promotion through Surpression

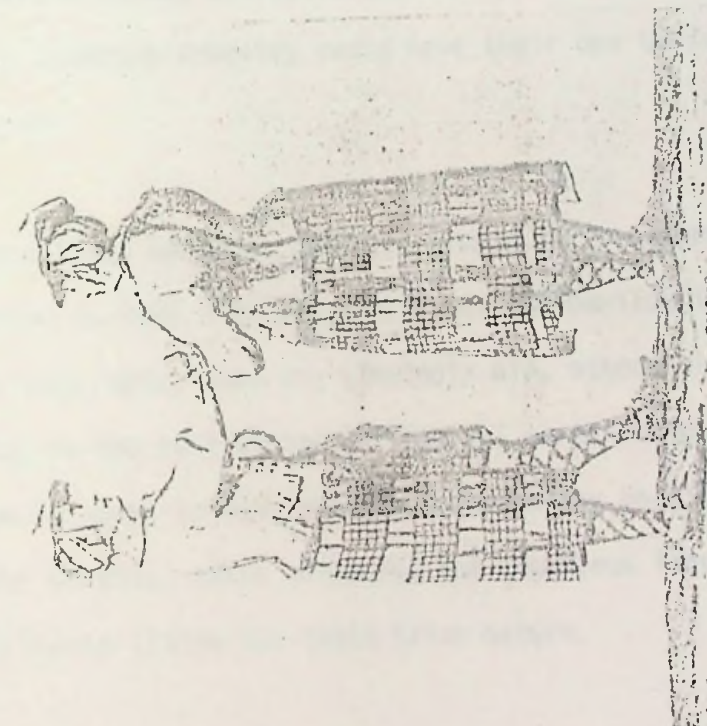
The weaving of their native cloth whatever it was - Bainin, Aran knitteds, Donegal tweeds etc. became a proud statement of tradition and culture somewhat unconsciously at first, but as imigration due to war, greed, restlessness etc, caused an influx of foreign invaders into native homelands, the importance of 'standing up to be counted' among your own became important. As has been stated, legislation against national costume by victorious invaders served only to strengthen the convictions of the defeated and pushed them to prove their unwillingness to submit even with the merest point of resistance such as free choice of costume.

The best illustration I could find for such a chain of events is the tale of enigmatic tartan, a tradition in Scotland and a romantic entanglement for many people.

After the 1745 Rising a large part of the clan system became outlawed and dispersed, and many of the smaller clans emigrated 'en bloc' or were forced to change their names. Depopulation resulted from extensive Highland clearances. By the time Sir Walter Scott's romantic but highly dubious versions of Scottish history - which nineteenth century England accepted as fact - became popular, the system had become totally confused.



I High-lander who put on his cloke about his shoulders,  
when weather is bad to him,  
So some Dicks, when the weather is bad to him,  
the Dicks, when the weather is bad to him,  
the Dicks, when the weather is bad to him,  
the Dicks, when the weather is bad to him.



The High-landers, in their accoutrements clothes, and downwards  
hanging, dikes,  
Dicks, in their accoutrements clothes, and downwards  
hanging, dikes,  
Dicks, in their accoutrements clothes, and downwards  
hanging, dikes.

5 & 6. ENGRAVINGS BY VAN DER GUCHT OF THE BLACK WATCH IN 1743

(Photograph kindly lent by J. Telfer Dunbar, F.S.A. (Scot.))

Fig. 14

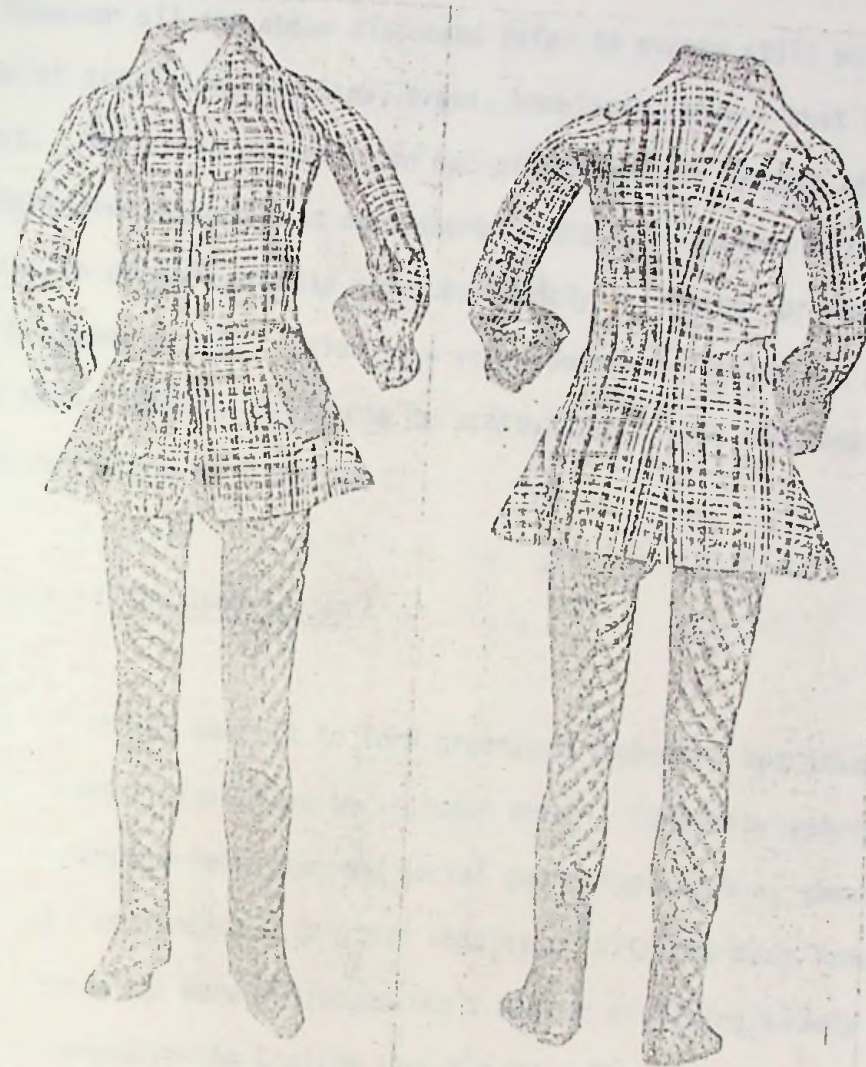


Clan boundaries had moved, splinter clans had formed, and the Highlands had been extensively infiltrated by Lowland family names.

The reason that tartans were proscribed by the English after the 1745 Rising was because they were associated with the Jacobite cause and not because they served any military purpose. Popular belief that they served as badges of clan loyalty during battles can be discounted because the clansmen set aside their colourful plaids before a conflict and fought half naked. The whole tartan myth is a modern one, perpetrated by the romantic if inaccurate works of Sir Walter Scott. Scott's writings inflamed nineteenth century England with a love of all things north of the Border and a need to identify with the poets Highland heroes. This need was amply catered for by the haberdashers who were used to following the fickle dictates of fashion, and very soon anybody who had a tenuous claim to Scottish ancestry could have their own tartan designed and made up to order.

Even Kings were not immune. George IV is recorded to have attended a function in full Highland dress. Of the bewildering array of tartans in existence today some are genuinely old, others are the product of wishful thinking on the part of people from all parts of the globe, and still more are town or area tartans unconnected with any particular clan or family. In spite of this, these colourful and ingenious frauds remain popular and have suffered little for their false nature.

Although perhaps a little more colourful than most, the story of tartan is typical of many such areas or family fabrics distinctions not least those lost due to desolate migration to the West of Ireland under the callous "to Hell or Connaught" attitude of the English invaders in our own history. The pattern of events was repeated over and over,



17. TARTAN JACKET AND TREWS STATED TO HAVE BEEN  
WORN BY PRINCE CHARLES EDWARD STUART IN 1746.

(By kind permission of H. M. Office of Works)

Fig. 15



tradition - suppression - revival, usually as a fashionable item, often with political overtones.

However all the above discussed refer to events still within the bounds of tradition, families, areas, homelands, always that is within context. What then of tradition out of context, as happens when one considers the cosmopolitan atmosphere of the town system, which perhaps did most to promote anomity and subsequently a longing for individual identity among people. Below is a very condensed view of the development of the town system, its effects on attitudes etc. and its link with the weaving tradition as I see it.

#### The Effect of the Town System

The Irish way was not to form organised townships but lived in scattered communities often in secluded areas. Community spirit was maintained through fair days and social gatherings such as shearing and 'thickening' as mentioned in other chapters. With the many invasions to which the Irish were subjected their manner of living slowly changed to resemble the English town system. The effects of such a system was not confined to Ireland but it is with Ireland we are concerned here.

The establishment of towns did much to influence the thinking of its occupants. As a commercial centre it attracted any migrant workers from all areas and also the interest of foreign merchants and traders. Along with the undoubted advantages of export possibilities, this also allowed an influx of imported fabrics. Fine silks, the like of which had never been seen in these islands, figured fabrics and brocades, all at reasonably low prices accessible to many middle and lower classes. The effects of this

trade were two-fold - homespun fabric usually available only in their area of origin, became openly available and could no longer be used as an identity symbol in the cosmopolitan atmosphere of the city; competition with fine fabrics, such as silk, caused a drop in homespun sales as rapid reaction claimed the market in novelty fabrics.

Up until this time, tweed clad newcomers were given the 'country cousin' label and thought of as generally unrefined and lacking in their rural background.

"God be with the days when you could always tell a girl was going to England or Scotland without having to ask at all, when you saw the new dyed red flannel for her petticoat, drying on the stones early in June".

28.

In Living Memory Traditions.

It might have been this unfavourable label or the possibility of a more sleazy product produced on a mass market basis, but the popularity of homewoven fabrics fell behind.

As towns developed, overcrowding became a problem. The filthy streets were paved with beggars rather than gold, trade was between the merchants and the very rich only, the lower classes wore rags, none of which survive and only the richer examples of cloth represent this era - the sixteenth and seventeenth centuries.

Slum areas built up and stories of better days coloured the lives of children born in these conditions. The image of the countryside and of those who lived there took on a new significance. The country symbolised fresh air, good living and quality - the tweed clad lady or gent was re-established and the products of the country again represented the qualities of life.





24. WOMAN'S DRESS FROM SHINRONE IN  
COUNTY OFFALY

Fig. 16

In short the popularity or fashionability of tweedy costume swayed according to the attitude towards it which had in turn been influenced by the picture or status which it had represented. They say 'the grass is always greener ...' well such was the case - when choice was limited home produce was used naturally; novelty articles then caused competition and the old faithfuls seem downgraded. But as familiarity and indeed the proverbial contempt crept in, the traditionals again held an air of stability, quality. So the tweed tradition went from 'country cousin' to 'country gent'.

#### Dedicated Followers of Fashion

The eighteenth century was a time of true fashionability, when the world followed the whims of the Paris fashion leaders, usually the followers of the King's court. These dedicated followers of fashion received justifiable ridicule for their many extravagances. Effect was everything, fashion was of the moment, with little attention paid to quality or lasting power. Such outward extravagance was to play a key role in the French revolution of the mid eighteenth century but the problem was dealt with less dramatically by other countries.

The Encyclopaedia of textiles<sup>29</sup> gives us an insight into the effects of such a fashion orientated industry in America. It states that 'fashion changed so quickly that entire plants were shut down overnight when a style changed. For instance, paper collars were in vogue for a year and then suddenly they disappeared. A single New York factory employed over 800 workers and turned out two million a day. When the vogue died, these people were out of work and the machinery invented to produce paper collars was discarded'. Such was the nineteenth century American fashion.



Also reported was the case of the American dressmakers, who 'made a gown of fine silk or wool with rows of pleated flounces draped over the skirt and a pleated under skirt, it was fashion. But as soon as it was repeated in cheap alpaca or imitation challis, which looked ridiculous, a new style had to be created immediately.

These changes affected the entire population, because machinery was not adaptable and had to be discarded when new styles came into vogue eg long skirts vanished in a season, the braided bottoms of skirts became obsolete overnight. In 1860 all branches of clothing manufacture were in a constant state of uncertainty. Handwork and peasant skirts were too costly for mass market and so the workers, who were constantly thrown out of work or poverty stricken by a cut in wages, demanded cheap ready made goods which wore out quickly and were not worth mending.

The turn of the century was to reinforce the recent return to sanity of the nineteenth century. In 1900 men of intelligence, integrity and new thinking studied the problems of fashion's transient nature and found a solution. Advanced modern educational methods were to change the habits and thinking of all classes. It emancipated women and in so doing did away with freakish styles. Quality and wearability became important. The simple tailor made suit, the shirtwaister and similar items that were worth making came into being (and were later to become fashion classics, tried and trusted).

### The Irish Context

For Ireland this new line of thinking was to open up new horizons or more accurately, rekindle old ones, as Irish tweeds had for centuries had a reputation of quality and durability.

As mentioned before, the intervention of the English Prime Minister, Mr. Balfour in 1891 saw the creation of the 'Congested Districts Board' (1891 - 1923) the primary function of this board was to take any necessary steps to aid the development of agriculture, forestry, the breeding of livestock, weaving, spinning and fishing and to assist in the development of other suitable industries. All of which would have improved the living conditions of even the poorest inhabitants. In the case of the weaving industry, this system included the monthly inspection, held at fairs such as Ardara and Carrick, of cloth before it is disposed of to dealers, every thread that attained a certain level of excellence was stamped with a mark which carried with it 'a small purse of money' for the producer.

After this positive contribution by the Congested Districts Board further support for the revival of the woven trade was received when in 1893 the Board united with the Irish Industries Association. This system supplied new, improved looms to 'out' weavers on a loan basis, examined and officially stamped tweed produced, granted financial assistance and advice to private groups or individuals who wished to initiate further industrial projects - the Providence Woollen Mill at Foxford was one of the first enterprises to be assisted thus.

The 1914/18 First World War interrupted the progress of improvement efforts. While the demand for 'homespun' tweeds greatly increased (due to lack of other fabric imports) there was a considerable falling off in cloth quality because of the developing seller's market. This sleazy product has caused homespun to fall into disrepute by the end of the war. This was partly on account of faulty workmanship, but more because in an age of rapidly changing fashion, homespun tweeds as they stood were being superseded, even people in homespun areas had ceased to wear them to any extent. New design input was required but that necessitated a financial



backing which as yet was not available for such an outdated produce.

### The Celtic Revival

The years preceding 1916 saw a definite buildup in anti-British feeling among the Irish. English rule had held out in this country, against almost traditional opposition, for centuries but the twentieth century saw the emergence of a new breed of patriot. The names of the revolution's leaders, Clarke, Connolly, Pearse, MacDiarmada, Ceannt, Plunkett and MacDonagh, are all well known but it was often the more prominent supporters of these, such as Maud Gonne and Countess Markievicz, who influenced most the daily thinking of the ordinary Irish. Against such a background perhaps it was natural that an extreme pro-Irish feeling expressed itself in a celtic revival lead by such supporters as these.

This renewed interest was in all things that symbolised Ireland - poetry and literature, often more popular for the occasional ban by the authorities, and also the so called 'wearing of the Green'. This phrase of course is not to be taken literally, but tweeds and Irish linen and poplin were worn often as a patriotic gesture and not just for their durable sensibility in a time of war. This aspect of patriotism was the background against which such organisations as the Irish country women's association was formed. A worthwhile legacy along with the wealth of poetry and literature which survives from that period.

Perhaps the most memorable aspect of this period with any fashion connotation refers to members of the then Royal Irish Constabulary, who due to the lack of uniforms were forced to wear khaki tunics with dark police trousers, or vice versa. The Irish called them the 'Black and Tans' and such a title was enough to breed hatred into any Irish heart, as these

men and the Auxiliaries had earned themselves an unrivalled reputation for drunkenness, violence and atrocity.

With this in mind, it seems ironic that it was a direct result of the English founding of the unsuccessful Congested Districts Board, that in 1930 the Gaeltacht Services division of the Department of Lands was charged with the continuation of the rural industries. This more modern minded Division undertook to update, revive and reorganise the Handwoven Tweed industry. The innovations of this Division set up today's industry particularly as regards the handweavers of the Western seaboard. Fine cloth was produced as a result of using the newer machine spun yarns. This also assisted duplication on a mass production level. Styles, patterns and marketing (in depots) was standardised. Courses of instruction, hire-purchase schemes for machinery etc. all contributed to the Division's success, the most impressive of which was their expanding export markets particularly to Britain.



## PART II CHAPTER V A Steady Market

### PART II CHAPTER V

#### A Steady Market

Contents: 1. At Home ...

2. ... and Abroad.

## PART II    CHAPTER V    A Steady Market

Continual updating of quality has been the primary concern of today's tweed manufacturers, developments such as sophisticated X-ray processes have been adopted to carry out final examinations and quality checks in order to ensure the maintenance of tweed's good name before being stamped with guarantee trade marks of the individual mills and 'wool mark' label (to be dealt with in further chapters).

Although much of this cloth is exported in the bale for overseas use, enough is retained by manufacturers to sustain their own garment trade for export as finished items.

### At Home ...

Many long established Irish firms have built up a name in world fashion as producers of high quality clothing with a distinctively Irish feel. Indeed some of our individual 'couture' houses have been directly responsible for bringing the adaptable style of Irish handwoven fabric to the international market.

Couturiers such as Ib Jorgenson, Kay Peterson, Clodagh, Neilli Mulcahy, Mary O'Donnell have combined their talents to give tweed the high reputation it now holds.

In particular the entry of Sybil Connolly<sup>31</sup> into the international fashion world in 1952 brought Irish handwoven fabrics into the limelight. Since then the great fashion designers of the world in Paris, London, Rome and New York have used Irish tweeds in their collections, but it is to our own designers, and Irene Gilbert, that the tweed industry owes its greatest





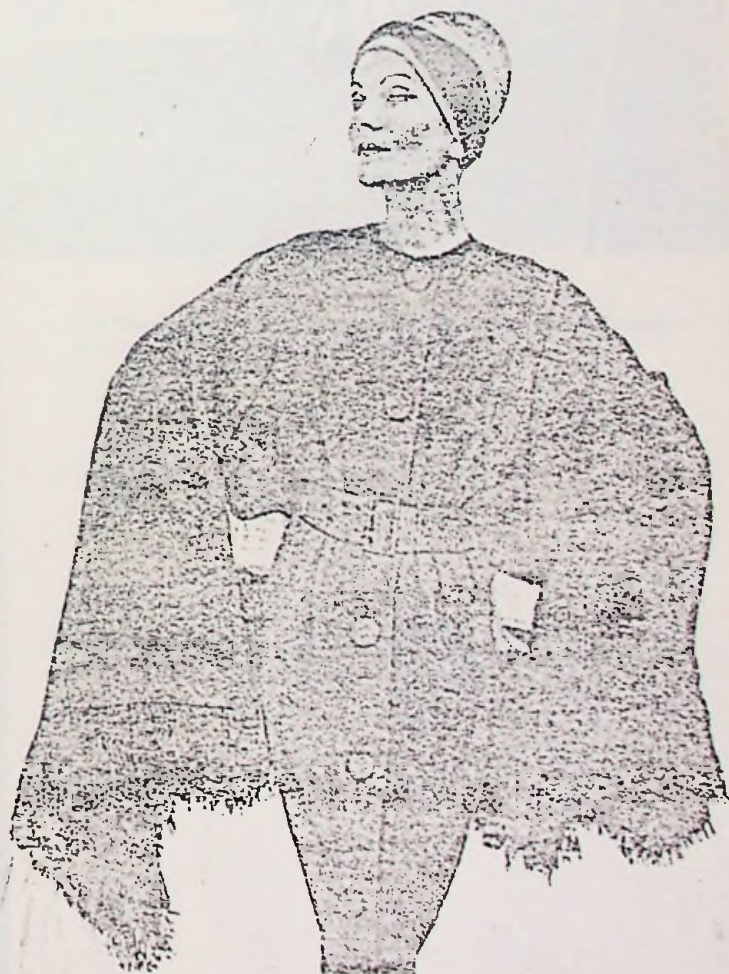
*Knopped handwoven Irish tweed in oatmeal and azure was chosen by Ronald Paterson for this suit.*



*An Irene Gilbert suit in royal blue and black handwoven Irish tweed.*



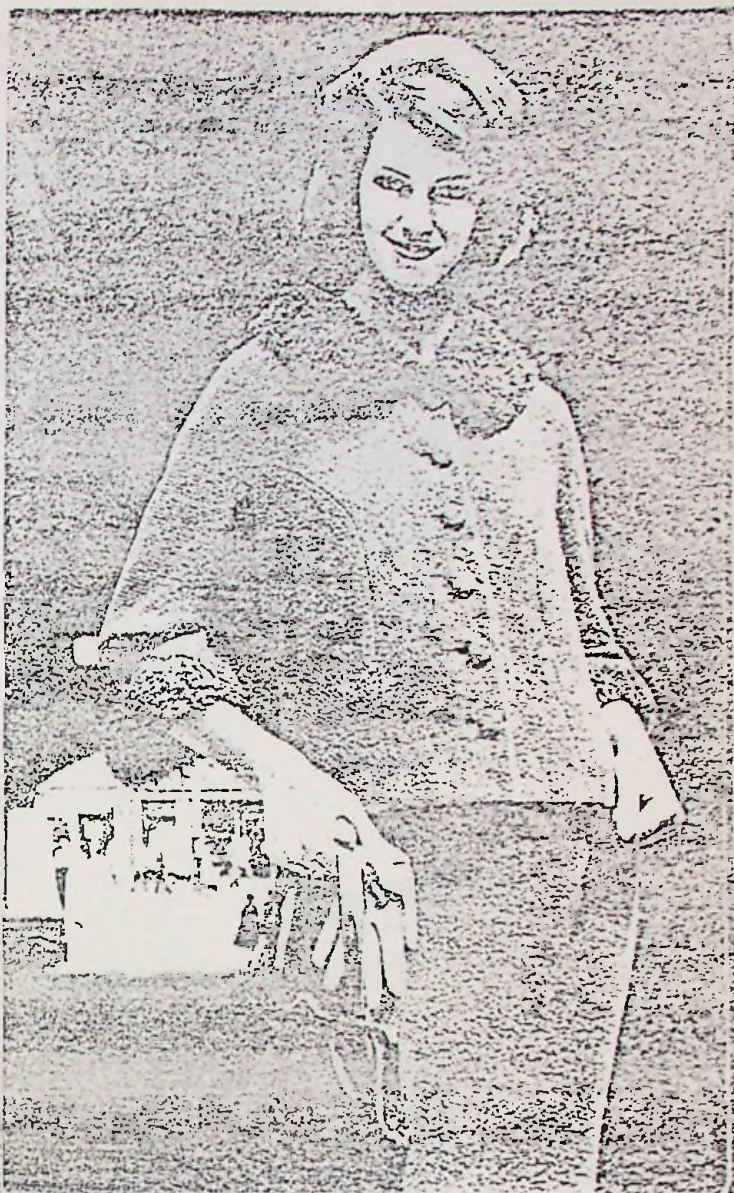
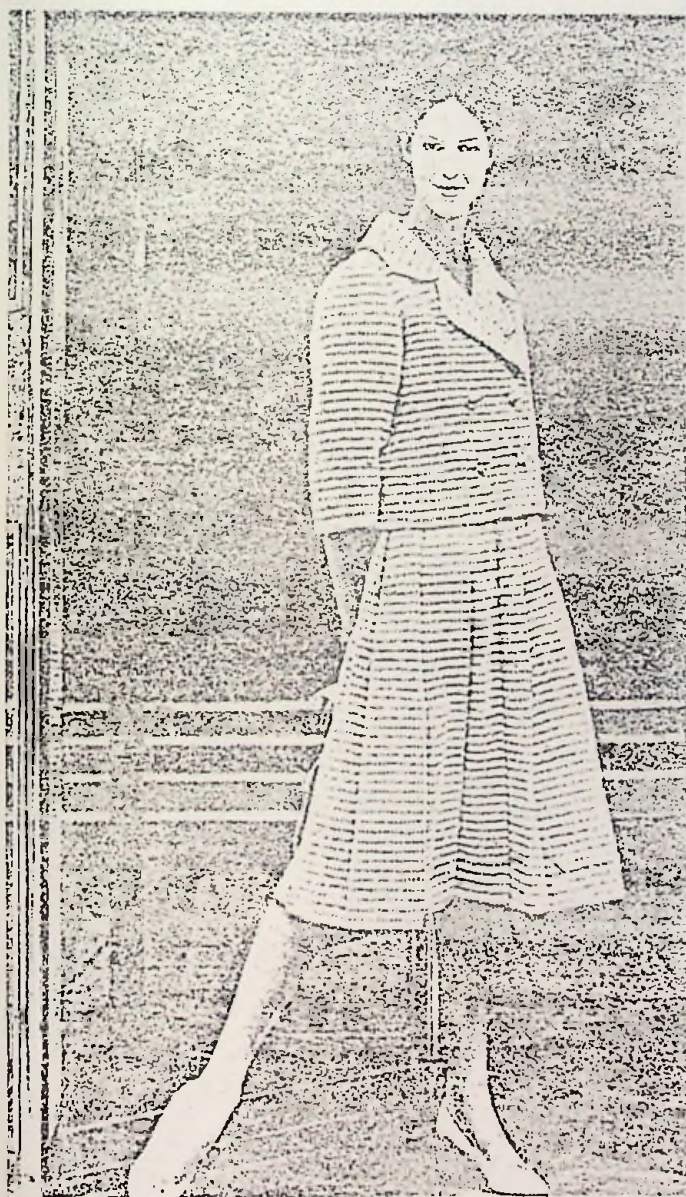
*This straight skirt in handwoven Irish tweed is a creamy shade characteristically flecked with ginger and brown. The coat is in grey, brown and black tweed.*



*Button-through dress in red and navy blue Irish tweed, designed by Raymond Kenna, and worn with a huge shawl fringed with navy wool.*



*Handwoven Irish tweed suit, designed by Sybil Connolly, in shades of coffee and cream.*



*The 'tweed fur' collar is a feature of this Sybil Connolly suit in blue and brown handwoven Irish tweed.*

Fig. 18      Irish design work





Fig. 19      Herringbone tweed coat



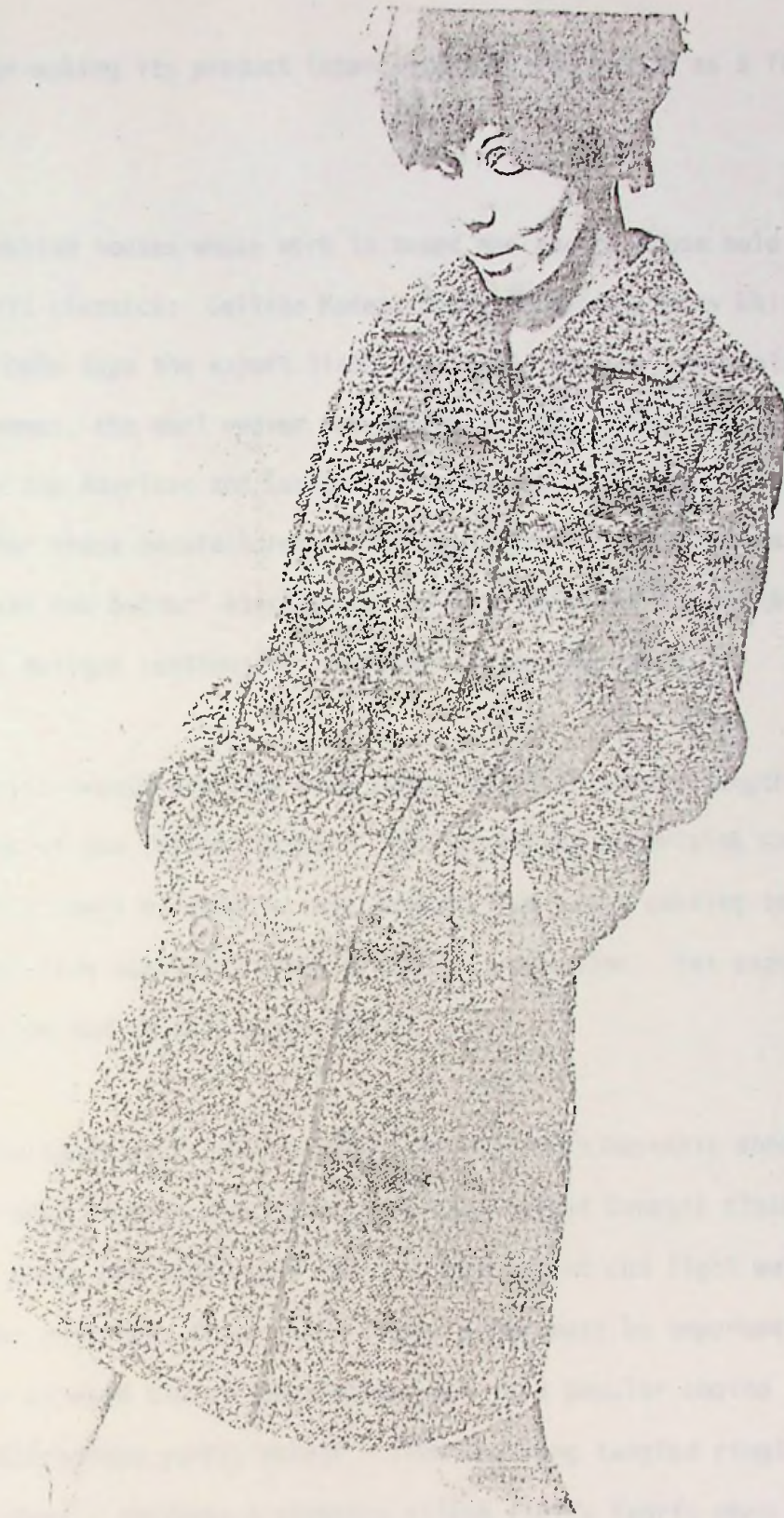


Fig. 20 Donegal tweed coat



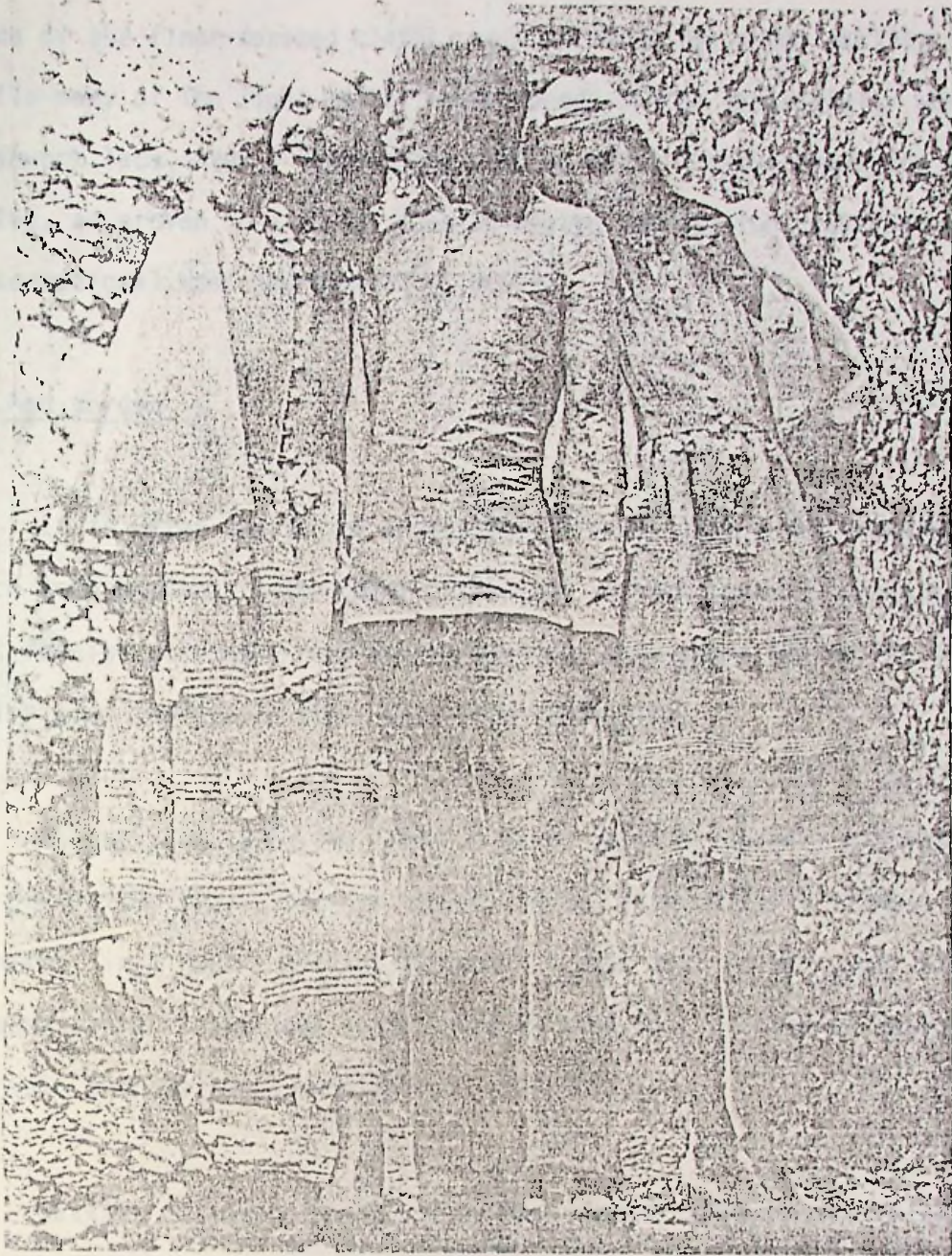
debt for making its product internationally recognised as a fashion fabric.

Fashion houses whose work in tweed has become house hold names and world classics: Collete Modes, Jimmy Hourihan, Henry White, Jack Clarke (who tops the export list) and Donald Davies. Garments bearing these names, the wool weaver and woolmark signs, grace the fashion floors of many top American and European stores. So consistent are the sales for these manufacturers that many refer to their long standing orders as 'bread and butter' stock while still introducing new cloth styles and garment designs continually into their extensive range.

Irish tweeds are also much sought after in fabric lengths for all sections of the fashion market. This is hardly surprising considering the available range of weights, all aspects from heavy coating to light gossamer fine wools for dress or blouse production. Yet experimentation in new design and texture never ceases.

The tough, wiry wool produced by the Irish mountain sheep is indeed superb when used in the traditional heavyweight Donegal cloth for coats, capes and upholstery fabrics, but medium and light weight tweeds call for a softer, finer yarn. These yarns must be imported and either blended or used alone. Australian wool is a popular choice for the mixing of featherweight yarns; mohair - from the long tangled ringlets of the Angora goat - produces a gorgeous silken fluffy fabric when worked in with tweed; a mixture of cashmere and mohair woven with Irish woollen yarn gives soft, smooth, fine tweeds eminently suited for cocktail wear. You can even find 'gossamer' tweeds that weigh as little as  $4\frac{1}{2}$  ounces per yard, webs of gauze-like woollen fabric, light and delicate enough to be used for evening wear in the manner of silk or chiffon, giving an effect of floating fragility.





*Two gossamer hand-woven tweed party dresses scattered with satin ribbon flowers—a gala interpretation of tweed from designer Clodagh*

59

Fig. 21



Some of the finer worsted cloths could be taken for a top quality linen, while many of the light basket weave tweeds can be successfully worn, like openwork lace, over a contrasting silk or satin without appearing at all bulky, as proven in a recent fashion design competition organised by the International Wool Secretariat (I.W.S.).

### ...And Abroad

It is often due to the promotional efforts of the IWS organisation that much international interchange within the woollen textiles trade takes place. But foreign designers have appreciated for some years the merits of using Irish wool fabrics in their exclusive collections.

As early as 1927, the famous classic designer Chanel, had proudly included in her collection ; "the new 'rouge' tweed, with red silk threads running the length", in a highly elegant fingertip length coat in her usual timeless style. Contemporary rivals such as Shiaparelli also lost no time in designing for the durable and aesthetic qualities of the cloth.

Textile designers continued to rise to the occasion and catered for the ever changing tastes of world fashion but always with quality as their primary consideration.

Today, trade in wool cloth is to all the major fashion houses - Milan, Paris, New York, London. The dominant designers, notably Kenzo and St. Laurent, all feature unusual fibre content in their seasonal fabric choice. So Irish mills - Magee, McNutt, Avoca - are all busy providing the exotic wool/silk and wool/linen variations for the finer light textured fabric styles which do so well in warmer climates. The prospects for Irish industry can therefore be optimistically good and consistently rising export figures seem to support this view.





10202.

Fig. 22  
Hourihan tweed coat



10024



Fig. 23

Hourihan 'salt & pepper  
tweed coat'



7098

Fig. 24

Hourihan check jackets



E. n. d.



## PART III      Chapter VI      The Wool Industry      Improvements and Properties

... the past few years, the wool industry has been able to ...  
 for many centuries. The wool itself was soft, and not too ...  
 ... in the ... other ...

### PART III      CHAPTER VI

#### Today's Woollen Industry

Contents: 1. Wool and synthetics - improvements and properties.

2. Dyes and dyestuffs - recent development and use.

3. The Irish Wool Secretariat and the Woolmark.

PART III      CHAPTER VI      Wool and Synthetics:- improvements and properties.

As has been seen, the woollen weaving industry has been just that for many centuries. The raw material was wool, pure and new, utilising crossbreeding or blending with various other natural fibres to produce the required yarn of a certain character.

Today, the blending and mixing of fibres for yarns and yarns for fabrics has become big business and an industry almost totally dominated by the laboratory. The study of these new innovations would provide a great work in themselves and the offshoots of this and other modern industries eg oil refining, have contributed greatly to not only the textile sense but to all aspects of modern life. Considering then the scope of such a field it can be appreciated that this paper can deal only superfluously with the synthetics advances which have joined wool and its blends in the industry.

From the turn of the century on, textile developments such as the introduction of rayon at the World Paris Exhibition of 1889 have caused sensation after sensation in the modern textile world.

32.

A brief chronological history reads:

"Rayon was first produced in this country by American Viscose at their plant in Marcus Hook, Pennsylvania, in 1910. Acetate, its companion cellulosic fibre was first produced by Celanese Corporation of America on Christmas Day 1924, at Cumberland, Maryland. Technical exploration continued to bring a host of new man-made fibres from American laboratories and pilot plants during the next half-century. Nylon, the first non-cellulosic man-made fibre, was first produced commercially by Du Pont in 1939, and soon became a major factor in every major



textile category, from cordage and carpeting to high fashion apparel. Acrylic, the second non-celluloic man-made fibre, was also first commercially produced by Du Pont in 1950. Originally considered merely a 'wool substitute' it has since developed into a major fibre in its own right. Polyester was first produced by Du Pont in 1953. Since that time, polyester has become the most dramatic growth fibre of the era, quintupling production around the world during 1962 - 8, from 500 million to 25 billion pounds."

### The Basis of Synthetic Trends

While interesting, the development of these new fibres, their properties, behaviour and individual use, are not in themselves relevant to this study, but as combination fibres used with wool, they constitute a tremendous bulk of today's fabric industry. Before considering then the possibilities in blends of natural and non-made fibres, it is necessary to note the reasons ie the characteristics of the major man-mades.

Nylon: used for straight, abrasion resistance and as an aid in weaving. It is often used as a core yarn. It also provides fabric durability, dimensional stability and press retention.

Polyester: used for overall wash/wear performance, for resistance to wrinkling and for press retention. It too, adds strength and abrasion resistance to blend fabrics.

Acrylic: used to create bulk without weight and for versatility in surface texture. It also provides dimensional stability.

Rayon: used for its 'natural' hand, for ease in processing and for decorative effects.

Each season brings about new blend innovations onto the market. Experimentation with different basic fibre combinations and proportions results in the creation of new fabric effects. These are variously used to achieve ease of care, texture, colouration, structural strength, durability and decorative effects.

Fibre blends most widely used in the textile products include:

With Polyester: Cotton, Rayon, triacetate, Acrylic, Silk, Worsteds, Flax, Mohair, Nylon/Cotton, Rayon/Cotton.

With Nylon: Wool, Wool/Cotton, Wool/Rayon, Polyester/Cotton, Cotton.

With Acrylic: Wool, Cotton, Rayon, Polyester, Rayon/Nylon, Acetate.

With Rayon: Polyester, Acrylic, Wool/Cotton, Wool/Nylon.

Consider then the boundless uses possible for the manufacture of space suiting, industrial protective clothing etc.

### Artificial Quality Additives

Besides the usual finishing treatments which for wool are quite considerable (perching, burling, specking, mending, sewing, crafting, scouring, bleaching, sometimes fulling, cargonizing and pressing (see Glossary)) functional and aesthetic finishes, often with one complementing the other, have been developed to extend yet again the potential range of textile usage. The former with a view to placing them on a more competitive level with the newer, man-made fibres by fortifying them against inherent faults in their nature. Some of these



functional finishes notably Dimensional stability (or shrinkage control) have become so widely used as to be termed basic in the cloth manufacture. Other such functional aids include:

Crease resistance: the fabric is treated with synthetic resins and frequently perform a more recoverative rather than resistant role by facilitating the fibres to 'bounce' back.

Water repellance: Although more repellent than most, wool's quality has been enhanced through many years of experimentation and subsequent abandonment eg. rubberising treatments with uncomfortable wearing qualities. (Rubber proofing factory established by Charles Macintosh in 1823) and vulcanisation 1835 - 45. The modern method includes the treatment of the cloth with ammonium salts which subsequently makes the fabric permanently water-repellent despite laundering and dry cleaning processes.

Flame Resistance: A factor made important by the need for industrial protective overalls and invaluable as a safety feature in the home also. Processes vary according to the fabric manufacturer and the new stringent standards applied by the Health Authorities.

'Hygienic' or Mildew resistant finishes: involves the application of chemical additives known to inhibit the growth of bacteria.

Moth-proofing: the fabric to be proofed is impregnated with chemicals unfit to act as food for the moth larva. Chemicals such as silico-fluoride are used but various tradenames utilise their own compounds.

Permanent pressing and texturising treatments allow for more aesthetic design consideration and have revolutionised the fashion fabric

and garment trade producing clothing which fulfils not only hygiene, safety and durability standards but which is also pleasing, fun and fashionable to wear.



## Dyes and Dyestuffs: Their recent development and use.

### Understanding . . .

The inquiring mind of man is never at rest, he seeks to make possibilities from the impossible and refuses to accept any subject has been developed to its nth degree. Such perfectionism has produced some of the world's greatest inventors who at very least have provided labour saving methods over traditional processes and at best opened up many doors to totally new concepts. Not least is the story of colour development, a natural phenomenon amply catered for by nature, but liberated to our understanding by man. So in the textile industry, is the story of 'the coming of age' of colour.

As has been seen, for centuries man has solved his need for colour and decoration by the use of animal, plant and mineral sources around him. But it was in 1856 that the story of synthetic colour begins.

### . . . and Exploitation

In the middle of the nineteenth century it was discovered that the the semi-liquid tars and residues left over in the industrial protection of coal gas were usable. An English chemist called Perkins<sup>33</sup> while experimenting to synthesise quinine, produced an unpleasant sludge-like substance mauveine, which when refined produced a powder with a pleasing colour. Applying the findings of Runge, a previous innovator with aniline in 1834, Perkins developed the first aniline dye. Soon after many aniline dyes began to appear on the market, magenta, aniline blue, Hoffman's violet etc. By 1858 the aniline dye had proved itself and is in demand to the present day.

In 1869 Graebe and Liebermann, Germany, succeeded in preparing Alizarin, the colouring matter of the madder root, from coal tar product anthracene. The first instance of the artificial production of a vegetable dyestuff.

A brewery chemist Griess (first applied a nitrogenous compound) discovered an extensive range of 'azo' dyes. He after applied this nitrogenous compound to wool and silk. By the end of the century most natural dyes had been ousted by the increasing numbers of basic, acidic, direct, sulphuric and insoluble azo dyes on the market.

Colour fastness was the only problem but in 1905 with the introduction of an indigo dye from a derivative of Anthraquinone was found to be colour fast and this laid foundations for the colourfastness of all dyes with an anthraquinone base (in 1922 a subcommittee of the AATCC was set up to research into methods of conforming to colourfast standards then being introduced)<sup>34</sup>.

The ball was in motion and experimentation opened up in this field led to rapid development and improvements culminating in the setting up of multi-million pound product and research laboratories in the area of dyestuffs such as Ciba-Geigy, a swiss firm in the field since 1905, and also subsidiaries of ICI chemicals.

Problems to be solved were many, not least the dyeing of new man-made fibres, but synthetic dyes coped with synthetic products producing a range of three basic dye types capable of handling any new products. Basic, direct and acidic dyes were formulated followed closely by improvements such as sulphuric, Azoic, vat, reactive and disperse dyestuffs.



With the main dye colour produced through natural methods, synthetic alternatives include Acetate, Alizarin (a madder type), Aniline, Black, Chrome, Soluble, Neutral and Indigo (a synthetic variety). These replace in some cases their natural counterparts discussed in the previous chapter.

## Facts of Interest in Today's Woollen Industry

### The Woolmark and the International Wool Secretariat:

The Woolmark symbol now appears on pure new wool merchandise manufactured by nearly 12,000 firms in thirty-five countries and on sale in at least 127 countries. The symbol is a certification trade mark which may only be used by end-produce manufacturers who have been licensed by its proprietors, the I.W.S. Nominee Co. Ltd., working through the International Wool Secretariat, but a certification scheme enables weavers of cloth made to Woolmark standards to attach piece tickets bearing a statement to that effect.

All merchandise licensed to bear the Woolmark must be made wholly from pure new wool, with special specifications as to its performance eg. a tolerance of up to 0.3% for inherent impurities and up to 5% for non-wool fibres in the case of visible decoration. Other Woolmark specifications vary according to the type of merchandise concerned. Some relate to tensile strength, others to colourfastness to light, water and washing - all very important factors when one considers the numerous uses to which fabrics are put. There are pile weight standards for Woolmark carpet and upholstery fabrics, while mothproofing and also grease content specifications apply in the case of carpets.

Compulsory standards of shrink resistance for most categories of Woolmark knitwear were introduced in Autumn 1968. All merchandise in those categories must now show the 'Washable Shrink Resistant' label.

The I.W.S. carries out a constant testing programme to ensure that all categories of Woolmark merchandise maintain the standards specified.



Since the Woolmark was introduced in 1964 the number of manufacturers licensed to use it has rapidly increased and the number of Woolmark garments produced throughout the world in a single year grew to nearly 150 million in 1968. In the five years following the introduction of the symbol in October 1964 it has been used on pure new wool merchandise valued at £8,000,000,000.

## Summary

The title of this paper is 'Wool in fabric and fashion'. Through the chapters we have followed the path of woollen cloth history in its practical application, its traditional craft basis, its development and improvement right up to today's modern industrial setup. We have heard of its background, the many colourful stories which surround its history, the wealth of folklore it has generated in Irish literature and finally the changing attitudes which have marked its progress towards today's fashion scene.

It has been maintained throughout that 'fashion is a criterion of life' and indeed it has been shown that in any given age 'a person's clothes have reflected his status, taste, profession and the history and climate of the country he inhabits'. In fact, in the eighteenth century, a certain <sup>35.</sup> Colley Cibber said of society's attitude to fashion- "One had as good be out of the world, as out of fashion." Certainly a concise summary of the time but also one which could be said of many occasions in fashion's varied history and one which forms a basis for the theories of attitude, individualism and nationalism expressed in this work.

As a part of the general fashion scene, the woollen industry has found itself spreading and diversifying not just nationally but intercontinentally. This tends to make the world an increasingly smaller place with less and less room for local variation to establish itself. However this also means fashion reaches more people than ever before, drawing them together and providing one of the principal factors in bringing about international understanding.

Community spirit and export deals have allowed for advancement in



livestock experimentation. New breed sources and better quality wool traits result naturally in better quality clothing at the far end of the market.

There are those who deplore this trend towards standardisation and maintain a nostalgic attitude towards picturesque garments and cloth manufacture. However in the real world there is little room for any stagnant thinking.

Modern weaving has tried to keep a 'foot in both camps' so to speak for while weaving itself has changed little in its essential form from craft or folkart days, technology has been embraced to enable it to cope with the pressures of life as an industrial concern. Therefore although major changes in process procedure have changed little through its history, labour saving and thereby money making equipment innovations, have been the main concessions to industrial development.

Techniques of mass production, the emancipation of women and the invention of man-made fibres have effected a revolution in style in the twentieth century. Development and knowledge gained in such fringe areas have often, as now, had considerable effect on the textile and fashion trades. Synthetic and chemical processes have not destroyed the role wool has played for centuries but have indeed strengthened its position with supportive qualities and aesthetic potential. However there is a definite trend towards wool/synthetic and wool/other natural fibre mixes and it could be noted that this trend would be likely to continue with each new synthetic on the market.

Not least can be quoted the tendency towards recycling. Waste substances from timber, oil refinement, waste paper etc. contribute

seemingly endless new sources of raw textile material to enthusiastic scientific use.

But the drive for tradition still flourishes even among such competition. Export and home markets are plied with wool promotional campaigns many of which use wide ranging excursions, such as that outlined in this paper, across centuries of history into the marvellous climate of aesthetics; it brings progress and achievement to date, into proper perspective and can only appeal to those who remember past eras with nostalgia.



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## A Glossary of revelant Textile Terms

All-Wool: A material of any description whose yarns are all wool, understood to be the wool of sheep. The term includes pure new fibres, shoddy, mungo, extract wool, reused wool, remanufactured wool etc. Very often an all wool fabric may mean very little quality-wise and results in confusion for the consumer.

Artificial Wool: Broad term for any fibrous material made to simulate natural wool.

Associations: The AATCC - (the American Association of Textile Chemists and Colourists) - a national scientific body whose members are chemists and others active in the dyeing, finishing and other chemical phases of the textile industry. Objectives are: to increase knowledge of the application of dyes and chemicals within the industry; to encourage research on chemical processes and materials; to develop standards for dye features and improve test methods and instruments.

The Wool Bureau - the U.S. branch of the International Wool Secretariat, a world-wide scientific and promotional organisation serving the wool industry.

Basic finish: One that alters or improves in some manner the texture or surface appearance or effect of a fabric. Examples include mercerizing, calendering, glazing, moire, napping, shearing etc.

Beaming: the process of winding the warp yarn onto the warp loom.

Bobbin: A spool-like device upon which filling yarn is wound for use in a shuttle in weaving. The bobbin sits in the shuttle. Yarn should come off the nose of the shuttle in an easy, convenient way.

Box Loom: Loom using two or more shuttles for weaving fabrics containing yarns of different size, twist or colour. Typical box loom fabrics are plaids, checks, crepes and gingham.

Burling: The removal of loose threads and knots from woollen and worsted fabric by means of a burling iron, a type of tweezer. Many knots are pulled or worked into the back of the fabric in case their removal may cause a

small hole in the goods.

Continuous filament: Regenerated, cellulose derivative or synthetic filament manufactured in a continuous filament form as distinguished from all natural fibres except raw silk which have a short staple or length.

Crimp: The waves seen or unseen, in textile fibres; noted especially in wool fibres in which there are 'waves within waves', known as serrations, chiefly not observed by the naked eye.

Dimensional stability: The ability of a fabric to retain its shape and size after being subjected to wear, washing and dry cleaning. This stability may be brought about by the kinds of fibre used in the fabric, by chemical treatments or by mechanical means.

Double Cloth: Two cloth are woven on the same loom at the same time; one fabric on top of the other. Binder threads hold the two fabrics together, one cloth forming the face of the double fabric, the other the back.

Drawing: Slivers from the carding machine are given more than one drafting treatment and doubling, and redoubling are given to the sliver, making it uniform.

Drawing in: The actual drawing in of warp ends from the warp beam, lease rods, through the heddle eyes on the harness frames and then through the reed splits at the reed of the loom. A plan must be followed.

Dry Finishing: Those processes in which the cloth is handled in a dry condition including perching, measuring, burling, mending etc.

False Twist: The major process used in texturizing filament yarns. Called by this name since the twist inserted does not become permanent. However the so called 'memory' of the twist remains giving a certain bulkiness to the yarn produced.

Finish, Finishing: A general term which covers treatment of a fabric to give a desired surface effect such as embossed, lacquered, napped, etc. It is the application of a pleasing or appealing effect to the fabric.

Hand, Handle: The reaction of the sense of touch, when fabrics are held in the



hand. There are many factors which give 'character' or 'individuality' to a material observed through handling - drapability, softness, launderability.

Harness: The frame upon which the heddles used in weaving fabric are placed. Harnesses, which form the shed of the loom so that the shuttle with the filling yarn wound on it may pass through this shed, are raised and lowered in accordance with the pattern set up by the designer.

Heddles: The series of wires held by the harness on heddle bars at the top and bottom loop for each of the harness bars so that they can be slipped onto the correct harness. Heddles keep the warp ends under control at all times.

Mule Spinning: This complex machine, which can spin as many as 1,400 yarns at the one time, has an intermittent motion. It draws out and twists a length of yarn, then winds it on to a cap, bobbin or tube, repeating the cycle several times each minute.

New Wool: One interpretation is that it is wool obtained in the fleece after sheep shearing. It also implies that wool fibres have never been utilised in the manufacture of a wool material.

Opening or Blending: Blending of fibres from a number of bales of stock for uniformity, and using opener picker machines for untangling, loosening the fibres and cleaning them, and to some degree to take out some of the foreign matter.

Perching: Examining cloth for all kinds of defects and blemishes while it is being run over a roller. All imperfections are marked with chalk.

Power Loom: A loom that is run by other than hand power. It is the advanced, modern, scientific type of hand loom and has all the modern improvements for production.

Reed: A wired comb-like device on a loom through which the warp ends are drawn to keep them uniform, under control at all times, and to prevent their becoming tangled and gnarled.

Ring Spinning: A system of spinning, wherein drafting the roving, twisting

the yarn and winding it on the bobbin, proceed simultaneously and continuously. Usually gives a stronger yarn and is more productive than the mule spinning frame.

S-Twist: A designation for that direction of twist in yarn the inclination of which corresponds to the central portion of the letter S. S-twist is also known as left, reverse, filling or crossbond.

Scouring: It is not an actual finish, but a most important process in finishing textiles. It is the cleansing of a fabric in totality, or its surface by washing and an abrasion or rubbing treatment. It may be done by washing the stock with soap, alkali, by treating with chemicals or solvents.

Shed of the Loom: The opening or space between the top and bottom sets of warp yarns which form the shed of the loom. Shed formation is made possible by the raising and lowering of the respective harness frames in the loom.

Shuttle: The boat-like device which carries the filling yarn wound on the bobbin which sets in the shuttle from a shuttle box on one side of the raceplate of the loom through the shed, and into a shuttle box at the other side of the loom.

Sleazy: Said of a fabric when it lacks firmness, is poorly woven, is not textured correctly, has an unappealing hand, and is poorly finished by being too smooth, slippery, and, generally speaking, a very inferior piece of goods.

Sliver: A loose, soft, untwisted strand or rope of fibres.

Slub Yarn: Yarn of any type which is irregular in diameter, may be caused by error, or purposely made with slubs to bring out some desired effect to enhance a material. Slub yarns are novelty features.

Spindle: A rounded wooden rod tapering at each end made to revolve and twist into yarn fibres drawn out from a bunch of wool, cotton etc. in the making of hand spun yarn.

Tensile Strength: The actual number of pounds resistance that a fabric will give to a breaking machine before the material is broken on the testing apparatus and may no longer be classed as a cloth or fabric.

Textured Yarns: Made of continuous filament yet made so fibres do not lie



parallel in the yarn, giving a somewhat softer handle than untreated filament yarns.

Thread: Thread is made from yarn but yarn is not made from thread. It is a highly specialized type of yarn used for some definite purpose such as sewing, basting or embroidery work.

Twist, direction of: A yarn or cord has S-twist if, when held in a vertical position, the spiral conforms in slope to the central portion of the letter S; and Z-twist if the spirals conform to the central portion of the letter Z.

Warping: Transferring of the yarn onto the warp beam which is built up in sections to make the complete warp beam filled out with the yarn.

Warp: Yarns which run vertically or lengthwise in woven goods.

Weft: The crosswise or filling pick yarns in a woven cloth.

Wool tops: Also referred to as worsted tops, it is the continuous sliver form of long, choice woollen fibres which are to be manufactured ultimately into worsted yarns.

Woollens: Cloth made from woollen yarns but not always 100% wool in content. The average woollen has a rather fuzzy surface, does not shine with wear, may hold the crease well, has nap and in the majority of cases, is dyed.

Woollen finish is easily recognised.

Worsted: A wide range of fabrics are made from worsted yarn and are compactly made from smooth, uniform, well-twisted yarns. It is a clear, surface fabric.

Yarn: A generic term for an assemblage of fibres or filaments, either natural or man-made, twisted together to form a continuous strand which can be used for weaving, knitting or otherwise made into a textile material.

Z-Twist: If the spirals in the yarn conform in slope to the central portion of the letter Z, then the twist is classed as Z-twist. Formerly known as right-hand or counter-clockwise twist.

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