

THE  
INDUSTRIES OF SCOTLAND

THEIR  
RISE, PROGRESS, AND PRESENT CONDITION.

BY  
DAVID BREMNER.



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## WOOLLEN MANUFACTURES.

HISTORY OF THE SCOTCH WOOLLEN TRADE—HOW THE PEOPLE DRESSED IN 1598—EARLY STATUTES FOR THE ENCOURAGEMENT OF WOOLLEN MANUFACTURES—STATE OF THE TRADE IN 1733 AND 1778—THE SCOTCH TWEED TRADE—THE MANUFACTURING PROCESSES—THE MANUFACTURE OF HOSIERY, CARPETS, ETC.—NOTES ON THE CHIEF SEATS OF THE WOOLLEN TRADE.

THE history of woollen manufactures in England dates back to the time of the Norman Conquest. The Flemings were so expert in making woollen cloth, that it was said of them that their skill in the art of weaving was a peculiar gift conferred by nature. Large numbers of weavers came over from Flanders in the train of the Conqueror, and in the intervals of turmoil prosecuted their calling with success. In course of time they thoroughly established the trade in the country, and in the reigns of Henry I. and of Stephen had accumulated so much wealth, that some of them rivalled royalty itself in the luxurious style in which they lived. About that time guilds or corporations were established in many of the towns where the manufacture of cloth was carried on for the purpose of its encouragement and improvement. Though the art of the woollen cloth maker was thus early introduced and encouraged in England, the state of society in Scotland was such that no attempt was made to create a home supply of clothing until many years afterwards. In the reign of Alexander III. considerable quantities of wool were exported to the Continent in exchange for linen, silks, and broadcloth; but there is no mention in the records of those times, so far as we have seen, which would lead to the belief that such things as spinning-wheels and looms then existed in the country. When the art of weaving was introduced is uncertain; but there can be no doubt, that in the fifteenth century cloth from native wool was made and worn in Scotland. In "Morrison's

Itinerary," giving an account of a visit paid to Scotland in 1598 by an Englishman, there is a description of the fashion in dress at that time:—"The husbandmen in Scotland, the servants, and almost all the country, did wear coarse cloth made at home, of grey or sky-colour, and flat blue caps, very broad. The merchants in cities were attired in English or French cloths, of pale colour, or mingled black and blue. The gentlemen did wear English cloth and silks, or light stuffs, little or nothing adorned with silk lace, much less of lace with silver or gold. And all followed at this time the French fashion, especially in court. Gentlewomen married did wear close upper bodies, after the German manner, with large whalebone sleeves, after the French manner, short cloaks like the Germans, French hoods, and large falling bands about their necks. The unmarried of all sorts did go bareheaded, and wear short cloaks with most close linen sleeves on their arms, like the virgins of Germany. The inferior sort of citizens' wives, and the women of the country, did wear cloths made of a coarse stuff of two or three colours in checker work, vulgarly called pladon [plaiding.]"

Cloth was made in those days in much the same fashion that is still followed in the remoter districts of the Highlands, where the wool is carded and spun by the females of the households as a profitable recreation in the winter evenings, and converted into "plaiding" or blankets by the village weaver. The fishermen and crofters of the Western Highlands and islands are generally clad in "plaiding," which, though rough in appearance, is durable, and to them cheaper than any other kind of stuff. Edinburgh was one of the first places in Scotland in which woollen goods were made, and it had at one time about the most important wool market in Britain. The weavers of the city were incorporated by the Town Council in 1475. In the petition asking for incorporation, it was set forth that the articles of the trade had been framed "for the honour and love of God, of His mother the Virgin, and of St Sovrane;" and it was specially stipulated that "the priest shall get his meat."

About the year 1600 seven Flemings were brought to Edinburgh to instruct the people how to make "seys" and broad-cloth at home, so as to be independent of a supply from England. There were many difficulties in the way, however, and no record remains to show that anything came of the scheme. When "the Hospital of our Lady," which had been founded in Leith Wynd, Edinburgh, by Bishop Spens of Aberdeen in 1479, passed into the hands of the Town Council in 1619, it was converted into a work-house, and named Paul's Work. The Council resolved soon after-

wards to try the experiment of giving an industrial education to the boys and girls in the workhouse, and for that purpose brought five men from Holland to give instruction in the manufacture of coarse wool stuffs. Though started under the most hopeful circumstances, and encouraged by numerous donations, the manufactory does not appear to have succeeded. Paul's Work was converted into a house of correction, and subsequently sold to Bailie Macdowal, who, about 1770, had it reconverted into a woollen factory, in which he is said to have made superfine broadcloth equal in quality to any brought from England. Paul's Work is now the printing-office of Messrs Ballantyne & Co.—a firm especially famous forty years ago from its connection with the works of Sir Walter Scott. It is mentioned in the records of the city of Aberdeen, that in the end of the sixteenth century, a Fleming obtained leave to exercise his profession in the manufacture of "gograms, worsets, and stamings" without any hindrance from the weaver corporation, on the condition of taking into his employment an apprentice, and instructing him in weaving and dyeing the kinds of cloth mentioned. In 1636 the magistrates of Aberdeen obtained a patent from Charles I. to establish a House of Correction, in connection with which, and with a view of "reforming their morals, and promoting good order and industry," a certain class of the community was to be instructed in the manufactures of broadcloth, kerseys, seys, and other coarse cloths. A situation for this institution was found in a part of the city now known as Correction Wynd. The factory was carried on for some years, but did not succeed, and in 1711 it was abandoned.

The first really energetic and promising effort to establish in Scotland a manufactory of woollen fabrics was made in 1681, by an English company under the management of Colonel Stanfield. The company acquired, in the vicinity of Haddington, a portion of the grounds which had belonged to the Franciscan Monastery, and erected thereon workshops, fulling-mills, dyeing-houses, &c., on an extensive scale. A number of workmen from England were employed to instruct the natives of the locality in the processes of manufacture. For a number of years the company prospered, and received great encouragement from the Government, several Acts of Parliament having been passed relieving them from payment of taxes, and conferring other favours. The services of Colonel Stanfield were acknowledged by his being made a knight. On the death of the colonel the affairs of the company got into confusion; and after struggling on for a few years, the company was dissolved, and the enterprise abandoned. Colonel Charteris bought the factory and grounds, the

name of which he changed from Newmills to Amisfield. A new company with a large capital was organised in 1750, and an effort was made to revive the manufactory, but unsuccessfully. Subsequently a third company gave the thing a trial, but with no better result. It was found that fine cloths could not then be made in Scotland so cheaply as in England, in consequence of the manufacturers of the latter country having attained great perfection in the various appliances and processes, besides enjoying other advantages. An Edinburgh gentleman who wrote on the subject 135 years ago, thus compares the two countries with respect to the manufacture of woollen cloth:—"The English have been long masters of the woollen trade. Their clothiers and piece-buyers are owners of stocks able to carry it on, to keep their goods on hand until a market offers, to sell them at reasonable rates and upon long time. England is sufficiently stocked—nay, one may say over-stocked—with the best of workmen in every branch of the woollen trade; and no country can succeed so as to be great gainers by any manufacture until it is sufficiently stocked with good manufactures, that their wages may be brought low enough to enable them to undersell their neighbours in that commodity at a foreign market. Whereas we have no stocks equal to so great an undertaking; we must also be at the expense to bring from England workmen for several branches, and to pay them higher wages than they get at home; and we cannot expect to get their best workmen. These, and many other difficulties not easily to be conquered, render it absolutely impossible for us to succeed in the woollen trade—at least in broadcloth, druggets, fine kerseys, and the woollen goods of Norwich." The author we are quoting from advocated the adoption of the linen manufacture as the staple of Scotland. Referring to what he considered to be the impossibility of Scotland ever becoming a seat of the woollen trade, he says:—"Nor is this any loss to us, since we have a staple manufacture of our own—at least, we may have the linen, in which the English deal not. They are too wise to encourage any manufacture in the weaving way that might interfere with their great staple, the woollen; and we should learn of them to discourage every trade that may interfere with or hinder the progress of our only staple." However strange these notions may appear to us who see the woollen manufacture holding the position of one of the most extensive branches of industry north of the Tweed, they were reasonable conclusions to draw from the facts on which they were based—namely, that woollen goods could be bought in England from 10 to 15 per cent. cheaper than in Scotland, and that linen cloth made in Scotland could be sold in

England at a profit of from 5 to 10 per cent. Considerable attention was bestowed on the linen trade, and its extension was encouraged in various ways; but such factitious encouragement did not deter some persons from persevering in the manufacture of woollen goods.

Various Acts of Parliament were passed for the encouragement of the woollen trade in Scotland. In the sixteenth century English-made cloth was coming into fashion, and it was feared that the effect would be to ruin the home manufacturers of that material. An Act was accordingly passed in 1597, which denounced "the hame-bringing of English claith, the same claith having only for the maist part an outward show, wanting that substance and strength whilk oftentimes appears to have." Another serious reason urged against the traffic in English manufactures was, that it was the chief cause of "transporting of all gold and silver furth of this realm, and consequently of the present dearth of the cunyie."

Act 8 of King William's First Parliament, dated January 31, 1701, "strictly prohibits and forbids the importation of all cloths or stuffs of any kind made of wool, or wherein there shall be any wool; as also of hats, caps, stockings, gloves, or any other kind of manufactured wool, or wherein any wool shall be found, excepting flannel allenarly." Heavy penalties were imposed for breach of this statute. On the same day an Act was passed setting forth that, "Considering the great hurt and prejudice arising to this kingdom and manufactories thereof by the exportation of wool, and of skins with wool upon them, His Majesty, with advice and consent of the Estates of Parliament, doth not only ratify and revive all former Acts of Parliament made against exportation of wool, or skins with wool upon them, in so far as they strengthen this present Act, and without derogation thereto in any sort, but also of new again do hereby strictly prohibit and discharge all and every person whatever, native or stranger, to export out of this kingdom any wool whatsoever, or skins with wool upon them, or any worsted or woollen yarn, or any sort of foreign wool, or skins with wool upon them, certifying such as shall contravene this present Act, that the wool or skins shall be confiscated, and two-third-parts thereof applied to the discoverer, and the other third-part to the Procurator-Fiscal of the Court where the confiscation is pursued, and the exporter fined in the sum of one thousand merks *toties quoties*. . . . In case any one concerned in woollen manufactures shall contravene any part of this Act any manner of way, they shall not only amit and lose their

share and stock in the manufacture in which they are concerned, to be applied to the discoverer, but also shall be fined in the sum of six thousand pounds."

In 1705 an Act was passed declaring linen and woollen manufactures to be free of duty on exportation. It had been enacted in 1686 that, in order to encourage home manufactures, all bodies of persons dying within the kingdom should be buried in Scotch linen, and that Act was ratified in 1695, and made more complete for its purpose. Subsequently, in order to give some encouragement to the woollen manufactures, the Acts referred to were rescinded, and in 1707 it was enacted that "no corpse of any person of what condition or quality soever shall be buried in linen of whatever kind; and that where linen has been made use of about dead bodies formerly, plain woollen cloth or stuff shall only be made use of in all time coming." The penalties imposed in the Acts relating to burial in linen were transferred to this Act. It may be mentioned that it is to the corresponding Act for England that Pope makes his moribund fine lady allude in the famous lines:—

" 'Odious! in woollen! 'twould a saint provoke,'  
Were the last words that poor Narcissa spoke;  
'No! let a charming chintz and Brussels lace  
Wrap my cold limbs, and shade my lifeless face;  
One would not, sure, be frightful when one's dead—  
And, Betty, give this cheek a little red.' "

There was published in Edinburgh in the year 1733 a book entitled "The Interest of Scotland considered; or, Reasons for Improving the Fisheries and Linen Manufacture of Scotland." The author was Mr Patrick Lindsay, Lord Provost of the city, who evidently possessed a thorough knowledge of the subjects of which he treated. His book contains the following account of the woollen trade as it then existed:—"At Kilmarnock are made of our own wool low-priced serges, known by the name of that place where they are made. These are partly for home consumpt, and partly for the markets of Holland; and, by the help of a little care and encouragement, burying crapes, at least those of a low price, might also be made there for home consumpt. At Stirling and its neighbourhood large quantities of serges are made, and several other low-priced woollen goods for furniture, all for home consumpt, and rather cheaper than such goods can be purchased in England. This business, by the care and vigilance of the Justice of Peace in those parts, is much improv'd of late. At Aberdeen, and counties adjacent, large quantities of our own coarse tarred wool are manufactured into

coarse serges, called fingsams, and knit stockings of all prices. Some of these goods are consumed at home, some of them exported to Holland, and some of them sold at London, and from thence are exported to foreign parts. At Edinburgh fine shalloons are made of our best wool, for home consumpt, and cheaper than they can be had in England. At Musselburgh there is a considerable manufacture of low-priced narrow goods, from thence called Musselburgh stuffs, for home consumpt, and export to the plantations; but these are now fallen so low in the price that the makers can scarce get their bread by them. At Galashiels are made a few coarse kerseys, called 'Galashiels greys,' for home consumpt; and was their wool better scribbled, their goods more milled, and better dressed, they might serve in place of the lowest-priced Yorkshires for country wear, to ordinary people, and day labourers. At Kirkeudbright, Hawick, Monygaff, and other places near the wool countries, several packs of tarred wool have been washed and cleaned, and some of it sorted and combed, spun, and wrought up into blankets, and other coarse goods, by private hands, for their own use; all done by the help of public encouragement, to advance the price of wool in those parts, but as yet to little or no purpose. As for the manufacture of broad-cloth, that consists of so many parts that we cannot carry it on without evident loss. First, we have no such thing as a wool stapler in the country, which lays the clothier under a necessity to buy his wool in the fleece; and unless he work up all the sorts himself (which no clothier can do without great loss) he must lose by those sorts he does not use. The washing, cleaning, and drying of wool, by beating it on the flecks, we understand pretty well; but we neither dye wool so well, nor so cheap, as the English do; and we have but few scribblers who understand the close mixing of wool on the cards for medleys. Our women are all bred to spin linen yarn, and are not so fit to spin woollen, especially carded wool for cloth, which no one can do to purpose who is not constantly employed at it. We understand the picking of cloth, and the thickening of it at the mill, pretty well, but we are not so adroit at the tasselling it on the dubbing boards, and are at a loss that we have no tassels of our own growth fit for this work, but are obliged to bring them from England in large quantities to lie by us, as we have occasion to use them. The most curious and difficult operation of the whole is the cutting on the shear-board, and finishing in the hot press. We have no shearmen of our own that understand their business to perfection, and as few pressmen, and must bring our press-papers from England; and the profits of the whole manufac-



ture depend upon the close and equal cutting from end to end, and upon proper and clean papers for every staple of cloth, and a just degree of heat and pressure in the hot press, neither too much, nor too little of either."

Mr David Loch, General Inspector of Fisheries in Scotland, published in 1778 a series of "Essays on the Trade, Commerce, Manufactures, and Fisheries of Scotland," in which he urged the people of the country to persevere in the establishment of the woollen manufacture then begun. He predicted that if they did they would "shortly see Scotland raised from abject poverty and mean obscurity to the same degree of opulence and dignity as our sister kingdom acquired only by this invaluable branch." He pointed out the importance, as a first step, of increasing the number and improving the breed of sheep, and threw out many valuable suggestions on the subject. The woollen trade appears to have been a "hobby" with Mr Loch, and he advanced no end of arguments in favour of its extension. Here is one of the most curious:—"The woollen manufacture is peculiarly favourable in promoting matrimony, and consequently population. Children from five years of age may begin to be useful, and are even employed in different branches of it which are singularly adapted to their infant state."

In 1776 Mr Loch made a tour through most of the trading towns and villages of Scotland, and his book contains some interesting information as to the state of trade and manufactures in each. The following are a few facts relating to the woollen trade, which may be put in contrast with the subsequent report on the present condition of that branch of industry:—In Edinburgh Mr Archibald Macdowal employed what was considered at that time to be "a great number of hands" in connection with his factory in Paul's Work, already referred to. He manufactured about 4000 lb of Scotch wool and 17,000 lb of Spanish wool yearly, and his machinery consisted of fulling-mills and a spinning-machine. Respecting the latter, we are told that it had been greatly improved by John Thomson, a person of mechanical genius. Mr John Ballantyne, wool merchant, combed 264 lb of Scotch wool, and dyed every colour to perfection, scarlet excepted. He employed the charity boys in the Canongate workhouse for four years in spinning wool yarn on the great wheel. Twopence a-pound was the price paid for combing long wool, and from 1s. to 1s. 3d. a-spindle for spinning, according to the fineness of the "grist." Most of Mr Ballantyne's workmen were paid according to what they produced; and it is stated that "they could easily gain one shilling a-day if they chose

to exert themselves." Mr Jeeves, of Edinburgh, was "among the best blanket makers in Great Britain." Carpet-weaving and stocking-knitting on frames were also carried on in the city. Both Edinburgh and Leith had wool markets; and the annual sale in each was about 20,000 stones of 22 lb. At Dalkeith 700 stones of wool per annum were manufactured into broadcloths, ranging in price from 4s. to 14s. a-yard. About 200 persons were employed, and the value of the goods turned out was about L.3000 yearly. The Musselburgh factories used 1000 stones of wool, and in addition worked up a large quantity of worsted yarn spun at Selkirk and Peebles. The chief produce was "manco-stuff" for the Edinburgh market. The prices varied from 2s. 6d. to 16s. 6d. a-yard. Haddington was regarded at the date of the record quoted from as a most suitable place for carrying on an extensive manufactory of woollen goods, and even then the value of its products from wool was estimated at L.5000 a-year. Upwards of 800 persons were employed in the trade. Wool was also manufactured into cloth, carpets, and stockings at Dunbar, Linton, Tranent, Linlithgow, Perth, and Inverness. In Glasgow there was only one woollen factory, and that was chiefly employed in making carpets. The prices paid to workers were the same as in Edinburgh. Stirling had long been known as an important seat of the woollen manufactures; and 160 looms, 38 stocking-frames, and 17 carpet-frames were employed in the trade. Shalloons, serges, and Highland plaids were the chief produce. In Alloa there were twenty manufacturers, employing 150 looms and about 500 workers, chiefly engaged in making "camblets." Though the looms of Fifeshire were mostly devoted to linen fabrics, a good deal of woollen cloth for local consumption was also made. Kilmarnock had 66 looms engaged on carpets, and 80 in other branches of the woollen trade. The manufacture is said to have been introduced by Miss Maria Gardiner, who, observing the indolence of the people of the place, brought spinners and weavers of carpets from Dalkeith about the year 1728. Ayr had about 100 looms and 15 stocking-frames for wool work. Dumfries and Sanquhar did a considerable trade in stocking-making. In Moffat 50 looms were engaged in serges, shalloons, blankets, &c. Elgin produced L.15,000 worth of yarn annually, which chiefly went into the London and Glasgow markets. There were two woollen factories at Peterhead, one of which turned out goods to the value of L.50 a-week, and the other L.60. The people of Ellon knitted stockings by hand to the value of L.100 a-week. Aberdeenshire seems to have been largely engaged in the stocking-trade.

The value of those articles made by Aberdeen manufacturers amounted to L.120,000 annually. In the town 240 looms were engaged on woollen and linen fabrics, but chiefly the former. At Montrose there was a woollen factory, in which seventy hands were employed. In Kincardineshire a considerable trade was done in stockings.

Regarding the Border towns, in which the woollen manufactures of Scotland are now chiefly concentrated, Mr Loch's narrative states that the people of Galashiels were very industrious, and that they were all employed in making coarse woollen goods, but principally "Galashiels greys." This cloth was made three-quarters of a yard wide, and sold at from 1s. 6d. to 4s. a-yard. Blankets were also made from Forest wool. There were 30 looms and 3 waulk mills in the village. There were then only 600 persons in the parish. The people made all the yarn required for their own use, and also a quantity for sale. The annual consumption of wool was estimated at 2200 stones. Melrose had 140 looms, most of which were employed in making woollen cloth. There were 65 looms in Hawick, employed on linens and woollens. Fourteen of these were carpet looms, belonging to Messrs Robertson & Co., who commenced operations about eighteen years previously, with a capital of L.400. There were six stocking-frames in the town, four belonging to Mr Hardie and two to Mr James Halden. Jedburgh is described as "a royal burgh where there has been much dispute and dissension about their town politics, so that the people have neglected all business, and paid little or no attention to manufactures." There were 56 looms in the town, but these were all employed in jobbing. In Kelso about 40 looms were employed, chiefly in making blankets and flannels. The weavers usually made seventy yards of flannel in two weeks on two looms worked by a man and a boy. The annual consumption of wool was 2200 stones. In Peebles 40 looms were employed in making coarse woollen goods. In Selkirk a few looms were devoted to jobbing work in wool, but a considerable quantity of yarn was made in the district. It was estimated that L.55 a-week was paid in the town for spinning. Looms might be found in almost every village of Scotland at the time referred to, but only in the cases mentioned did they do any but what was known as "customer work"—that is, the weavers worked up the yarns spun in the households of farmers and others, and the cloth was returned thither for the use of the families.

The progress made in the quality of the woollen goods manufactured in Scotland in the end of last century is indicated by the following paragraph, which appears under the head "Edinburgh,"

in the "Annual Register" for 1793 :—"An eminent manufacturer in this town has just finished two elegant gown-pieces, manufactured from Shetland wool, the one for Her Majesty, the other for the Duchess of York. He has also just finished a very handsome vest-piece for the Prince of Wales, and a beautiful gown-piece for the Duchess of Gordon, both from common Scotch worsted. Encouraged by such patronage, it may reasonably be hoped soon to see the woollen manufacture attain a degree of perfection hitherto unknown in this country. A gown-piece similar in pattern to that of Her Majesty has been ordered for the "Empress of Russia."

The woollen manufactures made considerable progress during the first quarter of this century. Improvements in machinery and the mode of working up the wool had brought about a gradual change for the better in the condition of the manufacturers and their work-people; and the good quality of their productions began to be more widely appreciated in the markets at home and abroad. In 1825 the number of persons employed in the various branches of woollen manufacture in Scotland was 24,800. The value of the raw material consumed was estimated at L.300,000, and the profit of labour at L.150,000; so that the total value of the produce was L.450,000. The superfine broadcloths made in Aberdeenshire competed successfully in the London markets with the productions of English looms, even although the latter enjoyed a world-wide reputation; while the advanced prosperity of all classes at home led to an increased demand for narrow cloths, tartans, checks, flannels, and the like. The power-loom was introduced into the trade about the year 1830, and by its aid the quality of the narrow cloths, or "tweels," was improved, while the rate of production was greatly increased. A year or two afterwards a little incident occurred which, while proving that there is something in a name, gave an impetus to the "tweel" trade, and helped to lay the foundation for the extraordinary development of that branch of manufacture which has taken place during the past thirty years. Messrs William Watson & Son, of Hawick, sent a quantity of "tweels" to one of their customers in London—the late Mr James Locke, who was one of the earliest merchants of that kind of goods in the metropolis. In the invoice the word "tweels" was written indistinctly, and was read "tweeds" by Mr Locke, who, in ordering a further supply, adopted what he conceived to be a new and happy designation. The writings of Sir Walter Scott had made the Border land and the Tweed famous all over the world, and the use of the name of the river to designate a material for dress manufactured on its banks, and those of its tribu-

taries, was shrewdly calculated to extend the popularity of the article. The name, added to the strength, flexibility, and other serviceable qualities of the "tweeds," made them fashionable among English noblemen and gentlemen who came to Scotland to shoot and fish, and they gradually worked their way into popular favour.

With this incident the history of the Scotch "tweed" trade may be said to open. It is consequently embraced in a brief period of time; and if we were to proceed in chronological order, this branch of woollen manufacture would fall to be dealt with after all the others. A slight link which connects it with the earliest products of Scotch looms, added to the fact that it is now one of the most important industries in the country, entitles it to precedence. The Galashiels "greys," "blues," and "drabs" ruled the fashion in male attire for many years; but the manufacture of these received a check by the commercial disasters of 1829; and the sameness of hues having by that time palled upon the public taste, it was found impossible to revive the trade. Something new was demanded by the public; and the manufacturers exercised their ingenuity to meet the demand. The first departure from the conventional "blues" and "drabs" is attributed to various persons. Sir Walter Scott, while Sheriff of Selkirkshire, had a pair of trousers made out of a Scotch checked plaid, and his example was followed by many persons. A new direction was thus given to the woollen trade, and the hopes of the manufacturers revived. The tweed trade, in its fullest development may, however, be said to owe its origin to the simple idea of twisting together two or more yarns of different colours. The author of this idea is not known; but Jedburgh claims the honour of having first produced cloth made of yarn of mixed colours. Granting Jedburgh the honour of the birth of the trade, the chief credit of its perfection and development must be given to Galashiels, which early stepped into the foremost place, and yet creditably maintains it.

In 1829 the tweed-makers could boast of only fifteen sets of carding-engines, but these represented a much greater number of manufacturers. In those days the fortunate possessor of "quarter of a set" was a "maister," and a man of means. In a business notebook belonging to one of the oldest firms in the trade, and containing a list of manufacturers in 1829, there are no fewer than thirty-four names, with a footnote to the effect that there was "a number of smaller ones." The total turnover per annum is put down at L.26,000. It is only by comparing these modest figures with the present overturn of upwards of L.2,000,000, that one can gain any-

thing like an adequate conception of the extent and rapidity of the development of the tweed manufacture.

The trade, no doubt, owes much of its success to the genuineness of the article produced, and the consistent "anti-shoddy" policy of the leading manufacturers. Unlike the much milled, much raised, and much shorn cloths of the Continent or the West of England, a thoroughly good Scotch tweed undergoes no process tending to injure the texture or impoverish the cloth, but comes to the wearer with all the natural strength of the material unimpaired—an honest stuff honestly manufactured. So long as the Scotch makers adhere to this policy, and refuse to be tempted into competition with unscrupulous imitators, they will no doubt continue to hold their own. Their strength lies in persistently sticking to the article which specialises them and most fully presents the character and features of the Scotch tweed. The moment they leave their own ground to compete with others, either in closeness and fineness of fabric or perfection of finish, their productions fail in comparison with the Belgian, French, and West of England cloths. A strong point is the purity and brilliancy of the colours obtained. The amount of attention given to style is another special feature which contributes largely to the general success and appreciation of Scotch tweeds. In this respect they rank second to none; and many makers, both English and foreign, who beat the Scotch in certain niceties of manufacture, notoriously imitate their styles. Imitation is the sincerest of flattery, but unfortunately, in this case, the Scotch trade pays for the compliment. A good style is often no sooner out than it is reproduced by Yorkshire makers in a lower quality; and beyond a doubt those "Yorkshire Scotch tweeds" interfere considerably with the sale of their more costly but, in the end, cheaper and more honest originals. In the jurors' report on the Exhibition of 1862, the following allusion is made to Scotch manufacturers:—"To the Scotch manufacturers belong the credit of having found out what the public like, and of having led for a considerable period the public taste. So largely have their productions been imitated on the Continent, that many of the choicest fancy trouserings of France and other countries are easily traceable in design and colouring to their Scotch origin."

The extent of the Scotch tweed trade may be learned from the following statistics, which have been drawn up with great care:—Number of firms, 85; sets of carding-engines, 340; spindles, 255,000; looms, 2720; horse power employed, 3400; weight of wool consumed annually, 10,642,000 lb. Number of persons employed:—

Males, 5440; females, 8169—total, 13,600; total population depending on the trade, 23,800. Capital employed, L.1,360,000; wages paid annually, L.340,000; value of wool used, L.1,064,200; value of goods manufactured, L2,040,000. To these statistics must be added the fact that a considerable quantity of yarn is spun for the tweed market in various parts of the country—a trade largely taken advantage of by manufacturers in busy times, but not included in the above figures. To show the progress made by the trade during recent years, it may be stated that in 1851 there were seventy-two tweed factories, employing 329 power-looms, and 225 sets of carding-engines, and the value of goods made was estimated at L.900,000. In 1862 there were eighty-two factories, employing 1069 power-looms, and 305 sets of carding-engines, and the value of goods made was L.1,830,000.

Though the tweed trade has extended from its birth-place to various towns between and including Inverness on the north and Dumfries on the south, it maintains its principal seat in the valleys of the Tweed and its tributaries. Most of the factories are of modern construction, a considerable number of them having been built within the past ten or fifteen years, while the old mills have been altered to suit the changes which have recently taken place in the modes and processes of manufacture, as well as in sanitary ideas. Many of the mills are stately edifices of four, five, or six stories, and their spacious floors are laden with machinery of the most ingenious and beautiful construction.

Nearly the whole of the wool used in the trade is imported from the colonies of Australia, New Zealand, and the Cape, and from Buenos Ayres, home-grown wool forming only a small proportion. In order to its being converted into tweed, the wool, after it enters the factory, has to undergo upwards of twenty processes, nearly all of which are performed by machinery. The wool arrives in compact bales, made up under hydraulic pressure, and bound with bands of iron. The “sorters” open the bales and separate the wool into classes according to quality. After being sorted, the wool is placed in a large bath, across which ranges of iron prongs are placed at intervals. This is the scouring-machine; and when it has been charged with wool, water, and a certain proportion of alkali, the prongs are set in motion, and the natural grease or “yolk” is thoroughly washed out of the wool. Connected with the scouring-machine is a wringer, through which the wool is passed, and from which it emerges in a slightly moist condition. It is then spread in a thick layer on the grated top of a chamber connected

with a fan. The air in the room on the floor of which is constructed the chamber referred to, is, by means of steam pipes, raised to a high temperature. When the fan is set in motion, it draws the heated air through the wool, which is thus rapidly dried. At this stage the wool is usually dyed, though in some cases it does not undergo that process until it has been converted into yarn. We shall suppose, however, that the dyeing is not to take place until the wool has been spun. After being dried the wool is passed through the "willy," or teasing-machine, which opens it up and extracts the dust and other impurities, and turns it out in loose flakes. When the natural oil has been separated from it, the wool becomes crisp, and in order to get it into a workable condition, it has to be slightly moistened with olive oil. This was done by hand until quite recently, but a machine has been invented which distributes the oil more evenly, and mixes it more thoroughly than it could be by hand. The wool is now ready for carding, which is one of the most important processes, as on the manner in which it is done depends to a great extent the quality and smoothness of the yarn.

Nearly all the machinery used in the woollen manufacture was devised for working cotton, but was readily adapted to the coarser though more valuable fibre. The credit of inventing such machinery lies chiefly with the cotton districts of England, so that the history of the inventions need not be minutely followed here. Hand-cards, for preparing the wool for spinning, were introduced into this country about five hundred years ago. But it was not until the middle of last century that any attempt was made to improve on those primitive tools. The first idea in the way of improvement was the fixing of a large card on a table or stand, and suspending over it two smaller cards, one of which the operator worked with each hand. The cards used in that way were called "stock cards," and as they enabled one person to accomplish more than twice the amount of work that could be got through by the old system, they were considered to be a great step in advance. When Hargreaves, Arkwright, Crompton, and Cartwright came upon the scene, and devoted their ingenious brains to the improvement and perfection of the appliances for working cotton, a revolution took place in the textile manufactures of the country. Machinery driven by steam or water power was applied to carding, spinning, and weaving, while to many of the other operations the assistance of the iron arm was extended.

Carding-machinery has been brought to great perfection by subsequent inventors. As used in first-class woollen mills, each set of "carding-engines"—the productive power of a mill is calculated by



the number of sets—consists of four machines. The first of these is called the “scribbler,” and has two large cylinders and twenty-five small ones, all closely covered with spikes of wire. The wool is fed on an endless apron ; and in order to ensure regularity, the apron is marked off into sections, and the girl who feeds the machine has to spread a certain weight of wool on each section, a pair of scales being attached to the machine for weighing the wool. In passing through the cylinders the wool is separated from all entanglement, and is drawn off in a continuous rope or “silver,” which is fed into the second machine, named the “first carder.” There is only one large cylinder, and about half a dozen small ones in the first carder, and the wire with which these are covered is finer and more closely arranged than in the scribbler. The “second carder,” through which the wool next passes, is in like manner finer than the first. In the early days of the tweed manufacture, the scribbler and one carding-machine were considered sufficient, but now second carders are invariably employed. Not only so, but another machine, which continues the carding and expedites subsequent operations, is being generally introduced. This machine is the “condenser,” respecting which something will be said further on.

Where the condenser is not employed, the wool is delivered from the second carder in detached pieces called “cardings,” equal in length to the breadth of the machine. As these are produced, they drop into the “piecing-machine,” which joins them together, and winds from ten to a dozen or more of them in the form of continuous threads on large bobbins, or spools. The spools are then placed on the “billy,” which does the first part of the spinning process, each line of twisted cardings supplying one spindle of the billy. The piecing-machine was invented by Mr John Melrose, of Hawick, in 1844 ; and, though now being superseded by the condenser, is a most ingenious piece of mechanism, and has done good service in its day, having been adopted not only by the Scotch and English manufacturers, but by those of Russia and other foreign countries. Before it was invented, the carding-machines could not be made above half their present width, and the piecing had to be done by hand, so as to get the wool passed through the “slubbing” on the billy. The inquiry which took place previous to the passing of the Factory Act in 1833 revealed the fact, that great hardships were endured by the children employed in the woollen factories ; and the hardest lot of all was that of the “piecers,” or children who joined the cardings on the creeping-cloth of the slubbing billy. The carders turned out the wool in rolls about thirty

inches long ; and, gathering up a handful of these, the piecer stood behind the billy, and as the cardings were drawn in he kept joining fresh lengths to the end of each. This work, which required constant watchfulness and great activity of the fingers, had to be continued for twelve, fourteen, and even sixteen hours a-day. The "creeping-cloth" was formed of coarse canvas, and, by frequent contact with it, the skin was rasped off the fingers of the children, and in the winter time especially they suffered greatly. \* Nor were these their only causes of unhappiness. If by any mischance or neglect they failed to piece one of the rolls, and thus caused an interruption in the work of the "slubber," they were severely punished. For eighty-four hours' work the boys received 1s. 8d. a-week, and an annual gift of a suit of "Galashiels grey" and a Kilmarnock bonnet.

The restrictions put upon the employment of women and children by the Factory Act led mechanicians to consider whether the labour of which the manufacturers were thus to some extent deprived could not be supplied by machinery. Several contrivances were tried, but Mr Melrose's piecing-machine was so complete that it was, as already stated, at once introduced into the factories. About the same time a great improvement was effected in the carding process. Formerly the carder was supplied with wool in the same way that the scribbler is now fed ; and it was, of course, impossible that the fingers could by mere instinct or knack of feeling adjust the wool on the feeding-table so as to be of a uniform thickness. As the wool went unequally into the carder, so it came unequally from it ; and as the rolls were thus unequal in thickness, so were the threads into which they were spun. This was a continual vexation with all yarns intended to be twined together in different colours for making tweed. Hand-piecing, too, necessarily stretched the loosely combined cardings, and careless children sometimes carried this "rackin' the rowin's," as it was called, to such an extent as often to make the yarn quite unfit for tweeds. As Melrose's piecing-machine got rid of hand-piecing with its faults, so the "feeding-machine" got rid of the evil of feeding the carders by hand. The feeding-machine was an adaptation of cotton machinery to woollen cards, and it operated by taking the wool from the scribbler in the form of a sliver, and applying it to the carder, as described above. To illustrate the advantage of the invention, it may be stated, that if the scribbler feeder makes an inequality on the feeding-table, that affects only the sliver coming off the machine at the time. Sixty slivers from the scribbler are fed side by side into the carder, and these sixty are reduced to one. Then sixty slivers from the first carder are put

on the second carder, and undergo the same process of reduction ; so that the original inequality is reduced in a ratio represented by  $60 \times 60$  to 1. Sliver-feeding is of equal importance as regards condensers, and, strange to say, the general introduction of those machines was delayed for many years owing to the want of sliver-feeding, although an apparatus for making the slivers was sent from America by the gentleman to whom Scotland is indebted for the condenser. The condenser was so called because it abbreviated the processes—taking the place at once of the billy and of the piecing-machine.

A little bit of history is connected with the condenser. Mr Thomas Roberts, of Galashiels, went to America in 1830, and there saw the condenser at work. Conceiving that it would be advantageous to the trade of his native town if such a machine were introduced, he set himself to study the condenser, and, having mastered all its parts, he made drawings which, with a minute description, he sent to his brother (Mr George Roberts, lately Provost of Selkirk). Models of the more important parts of the machine were subsequently sent, from which Mr George Roberts had a condenser constructed ; but a trial of the machine at Huddersfield Mill, Galashiels, was not satisfactory, and it was set aside. Mr Wilson, of Earlston, and Mr Houldsworth, of Glasgow, took up the idea, however, and obtained a patent for what they considered to be a perfect condenser. Manufacturers in Galashiels, Hawick, and elsewhere, gave this machine a trial, but found that they could not get it to make equal yarns, and in the case of mixed coloured goods the inequality caused shading, or “barring,” as it is technically termed. So the machine was condemned, and the gentleman who had first recommended it, and had made a considerable sacrifice of money and labour to have it introduced, was censured for what he had done, as a large sum had been sunk in machines which it was thought could never be got to work. Mr Roberts returned from America some years afterwards, and discovered to his surprise that the makers of the condemned condensers had neglected to supply an essential part of the machine—namely, that for feeding by slivers instead of by hand. The omitted portions of the apparatus, which had been lying for years in a lumber garret, were sought out by Mr Roberts. The other parts of the sliver-making machine were constructed under his superintendence, and the “feeding-machine,” as it was then called, was started in a small mill at Selkirk, which was the nucleus of the present Forest Mills, the property of Messrs George Roberts & Co. The improvement was so obvious that all the carders

in Galashiels and Hawick were fitted with it as speedily as possible. Melrose's piecing-machine was invented about the same time, and the two united marked a new era in the woollen manufactures of Scotland.

The condenser has been much improved by an English machine maker, and has been generally adopted. Essentially, the condenser is a carding-machine, the chief difference being in the delivering apparatus. When the sliver comes off the second carder it is wound up on large spools or bobbins. Fifty or sixty of these are set in a frame behind the condenser, and the slivers led in through rows of pegs, which draw them out a little and lay them flat on the feed-apron. The large and small cylinders are completely covered with the hooked wires which comb the wool, but while in the old carder the "doffer," or delivering cylinder, had a card and a space without card alternating in a longitudinal direction, the doffer of the condenser is covered with a series of belts of card, separated by a narrow space from each other. The old-fashioned doffer caught the wool from the cylinder so long as the card was passing it; but when the blank space reached the cylinder it made a break, and so each card of the doffer went round, and its burden was dropped into the piecing-machine in the form of a "carding." The condenser doffer, being a series of complete rings, catches the wool continuously on its side next the cylinder, and gives it off continuously at the opposite side in the form of a very small sliver from each ring. The slivers are caught by rollers and carried forward in a loose, delicate combination to what are called the "rubbers"—two endless webs of leather having both a forward and transverse motion, the latter rubbing each of the fine fillets of wool into a firm condition, so that they may be wound upon a bobbin. When the wool reaches this point it is ready for the next process—the spinning. The delicacy of the condensing process may be judged of from the fact, that it is not unusual to see the slivers, or "rovings," as they are sometimes called, so light that it would take four of them to be as thick as one of the threads from which Scotch blankets are usually made.

The earliest mode of spinning wool and other fibres was by means of the distaff and spindle, and no improvement was made on those appliances until spinning by a wheel was invented in the fourteenth century. Though the spinning-wheel, even in its simplest form, was a great advance on the distaff and spindle, yet it did not speedily supersede them. Ladies had adopted spinning as an easy and profitable recreation for their leisure hours, and preferred the ancient method, which remained in use until a time within the recollection

of many persons yet alive. About the middle of the sixteenth century a great improvement was made on the first form of spinning-wheel, by so constructing it that the operator could be seated, and by means of a treadle keep the spindle in motion, thus admitting of both hands being used in manipulating the wool. Spinning-wheels of this kind are to be found in almost every home in the Highland districts, where one of these articles is still considered a most suitable gift to a bride. The spinning-wheel forms a picturesque and significant accessory in many paintings of domestic scenes in the pastoral regions, and our Queen not only owns one, but knows how to use it. The "muckle wheel" was employed extensively in some parts of the country in preference to the treadle wheel. It consisted of a fly-wheel of wood which set the spindle in motion. The operator gave the wheel a smart shove round with the hand, and then walked backward, as ropemakers do. By holding the roll or carding of wool firmly between the fingers while retreating, it was drawn to the required size of yarn. The impetus of the wheel enabled the spinner to retire five or six yards, and a thread of that length having been produced, it was wound up on a spindle as the operator returned to give a fresh impulse to the wheel. As the textile manufactures of the country extended, a more expeditious mode of spinning was desired, and many unsuccessful attempts were made to supply the want. At length the difficulty was overcome, to an extent never dreamed of, by the invention of the "spinning-jenny." The author of that contrivance was James Hargreaves, a weaver at Standhill, near Blackburn. Too poor to patent his machine, and so make a fortune by it, as he would undoubtedly have done, he employed it secretly in making weft for his own loom; but the knowledge that he had devised labour-saving apparatus got abroad, and his neighbours broke into his house and destroyed the "jenny," little calculating that in that rudely-constructed piece of mechanism lay the germ of much of the subsequent manufacturing prosperity, not only of England, but of the world. Arkwright, also, succeeded in producing a spinning-machine based on an invention of a foreigner named Paul, who conceived the idea of spinning by rollers, though he did not succeed in carrying it into practice. A third inventor—Samuel Crompton, weaver—united the leading features of the "spinning-jenny" and Arkwright's machine in the "spinning-mule," which is now universally used in spinning wool, linen, cotton, &c. A subsequent inventor has given the "mule" the power of self-action, and now it spins 500, 800, or even 1000 threads at a time without requiring any attention beyond

that of a boy or two, whose duty is to mend any threads that may break. The self-acting mules are now coming into general use in the Scotch woollen mills, and it is no uncommon thing to find in one apartment, and under the charge of not more than a dozen persons, machinery capable of producing as much yarn in a day as could be made in the same time by 20,000 of the most expert spinners with the old-fashioned wheel.

The yarn requiring to be dyed is reeled into "cuts," and "hanks" of three, four, or six "cuts," as found most convenient. The oil is then scoured out, and if the yarn is not to be coloured, it is hung up in a close room and exposed for a certain time to the fumes of sulphur, which make it a pure white. All colours of yarn are employed in the tweed trade; and as a good deal of the beauty of the cloth depends on the quality of the dyes used, the dyeing is one of the most important departments of the manufacture. Some knowledge of chemistry is essential on the part of the foreman, and a thoroughly efficient man never fails to obtain liberal wages. In the early days of the woollen manufacture of England, dyeing was but imperfectly understood. Not that there was any want of a variety of dye stuffs; but their chemical qualities were not sufficiently known to enable them to be successfully applied. The importance of the art was not lost sight of, however, and foreign dyers were encouraged to settle in the country. In 1552 an Act of Parliament was passed limiting the number of coloured cloths to "scarlet, red, crimson, murray, pink, brown, blue, black, green, yellow, orange, tawny, russet, marble grey, sadnew colour, asemer, watchett, sheep's colour, lion colour, motley, or iron grey." In the reign of William and Mary, the list was extended by the following additions:—"Violet, azure, friar's grey, crane, purple, and old medley." Not only were the colours limited, but the mode of producing them was regulated by statute, the use of certain materials—such as logwood and gall—being prohibited. In the sixteenth century manufacturers began to dye the wool before it was spun, instead of, as formerly, after it had been spun and woven. Notwithstanding the variety of colours which the dyers were capable of producing, only a few could be considered good or permanent; and up till 1667 the fine broad cloth of England was sent to Holland to be dyed. During the last fifty years a great advance has been made in the art. Chemists have successfully sought to increase the number of dyes, and the man who discovers a new and really good tint now-a-days may be said to have found a fortune. From the most unlikely materials beautiful colours have been extracted. A dye closely allied both in properties and

appearance to the famous Tyrian purple has been extracted from guano ; and the nasty tar which exudes from coal in the process of gas-making has recently been found to contain the elements of a series of dyes of great beauty. Wool is always dyed in boiling liquid, the heat being necessary in order to fasten the colours. The yarn is hung upon poles which stretch across the boiler and rest upon its sides ; and while suspended in that way, the dye has free access to every part of it. In order to facilitate the process the workmen keep constantly turning the hanks on the poles. The time usually required for all the operations in dyeing ordinary colours is three hours. The tweed manufacturers have bestowed great attention on dyeing, and with the most gratifying results ; but it is not necessary to go further into the details of the art in this place, though they are exceedingly interesting.

On being taken from the boilers, the yarn is rinsed to free it from superfluous dyestuff, and is then carefully dried. The yarn intended for the warp, or longitudinal threads of the web, is more firmly twisted than that for the weft ; and on the completion of the dyeing process, the former is wound on bobbins for the warp-mill, and the latter on pirns for the shuttle. The warper takes the bobbins, and, by the use of a winding-machine of peculiar construction, arranges the threads in parallel rows, and finally winds them on a cylinder which forms part of the loom. The warp threads are then drawn through the " heddles " and " reed " by boys, and the whole is ready to be fixed in the loom. Before the invention of the power-loom, weaving was done by hand, and the loom employed was of the simplest construction. A few specimens of the hand-loom still linger in the manufacturing centres, and in the rural districts, where faith in " home-made " stuffs still survives. Up till twenty years ago the hand-loom weavers formed a large section of the industrial population of Scotland, and most of them worked in their own houses, before the factory system was developed. They were a grave, thoughtful, and exceedingly industrious class ; and from their ranks went forth many men who took an advanced position in the world of learning, or were noted for their commercial enterprise. Among those who still preside at " the four stoops of misery," as the hand-loom is designated in some parts, men are to be found who possess a knowledge of history, politics, and general literature that would adorn a much loftier station of life. As a class, they suffered great hardships through the introduction of the power-loom. Those among them who had spent their early days and prime of manhood in throwing the shuttle, could ill adapt them-

selves to other pursuits ; and they clung to their vocation, resolved to be content with an occasional web which they calculated would fall to their share when the productive power of their mechanical competitor was unequal to meet the extra demands made upon the manufacturers for certain classes of goods. In this way those of them who remain are still employed, and usually when they obtain a web, they have to sit at it early and late to get it done within a limited time. Their life is thus, in many instances, made up of days and nights of close application to work, followed by disheartening intervals of idleness. The handloom weavers are generally to be found together in a certain quarter of the town, and in several cases that quarter is known as the Weavers' Row. In busy times, the "rickle-tick" of the looms may be heard issuing from every door and window, and a stranger might have the impression that he was in the midst of a hive of industry in which the bees could not fail to have every comfort and happiness. But there are frequent gloomy, weary days, in which the shuttle lies at rest, and the men hang about the doors with sad countenances, or saunter to the factory to ascertain what prospect there is of obtaining another job. It is a curious fact that in Galashiels hand-loom weaving is still paid by the scale of rates which ruled before the introduction of the power-loom.

The invention of the power-loom marked an era in the textile manufactures of the world. Like most other contrivances used in making woollen cloth, the power-loom was originally devised for weaving cotton. The inventor was the Rev. Dr. Cartwright, who, considering it probable that when Arkwright's patent for spinning machinery expired, so many mills would be erected, and so much cotton spun that hands would not be found to weave it, suggested that Arkwright's next task should be the invention of weaving machinery. The hint thus thrown out was allowed to pass unheeded, the doctor's manufacturing friends considering the weaving of cloth by machinery to be an impossibility. Though not a mechanic, Dr Cartwright regarded the idea to be not only of vast importance, but of perfect practicability. He devoted close attention to the subject for a year or two, and patented two machines, neither of which, however, could be got to work satisfactorily. After years of anxious labour, and the expenditure of L.40,000 on experiments and patents, the Doctor so far succeeded that, on application to Parliament in 1808, he received a grant of L.10,000 as a return for his losses and exertions. Other hands took up the machine, and it at length was made perfect, and for about forty years has been



employed in the manufacturing districts of England. Among those who tried to devise a machine to supersede the hand-loom was Mr Bell, of Glasgow, who in 1794 had a power-loom constructed; but he did not succeed in getting it to work. In 1796 Mr Robert Miller, of the same city, patented some improvement on Mr Bell's machine; and in 1810 a factory furnished with 200 improved looms was erected at Pollockshaws. Several years elapsed, however, before the enterprise succeeded. In 1825 there were but 1500 power-looms in Scotland, and these were applied only to the production of coarse linen and cotton goods. A few years afterwards an attempt was made to weave woollen yarn on them; but before that could be done certain improvements had to be effected, and it was not until a few years later that the machine was got to work properly. Now the power-loom is almost exclusively employed in the tweed trade, and as adapted to that particular branch of weaving it produces work of unequalled quality.

The general distinction between a tweed and a cloth is that a cloth is woven loosely and felted firmly, while a tweed is woven firmly and felted in a less degree. On the loom the tweed looks so close and fine that it would be thought impossible to improve it. In passing through the weaving department of one of the large tweed factories, one is struck by the great variety of styles and patterns in progress. Each loom works two widths of cloth, and though the same shuttles cross the warp of both, the colours of the completed fabrics may differ considerably. By using warps of different hues, the cloth, though made with the same weft, will of course be dissimilar in shade. To the inexperienced eye the appearance of many patterns of tweeds differs little from that of plainly woven cloths, but that little distinction is often the result of no small amount of ingenuity in the distribution of the threads and colours in the loom. For fancy patterns the looms commonly used are a modification of the Jacquard, limited to work twenty "leaves" or sets of "heddles." The looms are superintended by young women, who earn large wages, and to whom the work is well suited, as it is easy and healthy. They have simply to look out for and mend broken threads, keep the shuttles supplied with yarn, and remove any knots or imperfections in the work. The handloom weavers had a strong prejudice against the power-looms, and would not relinquish their old-fashioned machines and go to work with the new; hence females were set to do the work. Ultimately the men came to think that they should overcome their prejudices, and many of them would fain take charge of the

power-looms; but the women having got possession, determined to keep it, and minding a power-loom is now regarded as a woman's and a womanly occupation.

On being taken from the loom the cloth is examined by "birlers," who pick out all irregular threads, hairs, or dirt; and by "darners," who insert with a needle any portions of the warp or weft that may have been omitted in the weaving. It is then milled or "fulled." From a peculiarity in their formation, the fibres of wool possess the property of felting, and under the action of the fulling-mill, they become hooked together in a compact layer; and by continuing the process of fulling for a sufficient length of time, the warp and weft of a piece of cloth would get so united as to be indistinguishable by the eye. As already pointed out, however, the degree of fulling forms one of the distinctions between superfine cloth and tweed; for while the former receives four fullings of three hours each, the latter generally receives much less. To variety of style in tweeds has recently been added variety of finish, and while some cloths are highly felted, others receive no more milling than is necessary to cleanse them thoroughly. Cloths made of scoured yarns are usually milled with fuller's earth, which, while it possesses great cleansing properties, is less liable to injure delicate colours than soap containing alkali. Before the invention of fulling-mills, the cloth was "waulked" or shrunk by being tramped by men's feet in tubs; and when that method of conducting the operation was superseded, the attention of the Parliament of Edward IV. was seriously called to the fact, that "hats, bonnets, and caps, as well single as double, were wont to be faithfully made, wrought, fulled, and thicked by men's strength—that is to say, with hands and feet—and thereby the makers of the same have honestly before this time gained their living, and kept many apprentices, servants, and good houses, till now of late that, by subtle imagination to the destruction of labour and sustenance of many men, such articles have been fulled and thicked in fulling-mills, and in the said mills the said hats and caps be broken and deceitfully wrought, and in no wise by the means of any mill may be faithfully made."

After being milled, the cloth is "raised" by being passed over a cylinder covered with teasles—the seed-pods of the *Dipsacus fullonum*, a plant extensively cultivated for the purpose in the cloth-making districts of England. Numerous attempts have been made to supply the place of the teasles by cards or combs of wire; but nothing that has yet been tried can raise the fibres so nicely, and with so little injury to the cloth, as the teasle. The cloth is

stretched on "tenters" or rails to dry. Each rail has a row of hooks, and on these the cloth is fastened, a selvage of coarse wool being worked on the web for the purpose of accommodating the hooks without injury to the body of the fabric. In that way the cloth is evenly stretched; and when it dries, the threads lie straight and regular. A tentering and drying machine has recently been introduced, which enables the manufacturers to carry on their operations independently of the weather. The cloth, as it enters the machine, is caught by a series of tenter-hooks attached to a pair of endless chains. It is then passed over a range of heated pipes, which rapidly expel the moisture.

The next operation is "cropping," or cutting off the long fibres raised by the teasles. In an interesting paper on the "Wool Manufactures of Hawick," recently read to the Hawick Archaeological Society by Mr D. Watson, the following account is given of the manner in which raising and cropping were done in the early days of the woollen manufacture:—"The cloth, being stretched or hung over a frame in front of the workman, was brushed over with hand-cards, previous to the introduction of teasels, to raise the loose fibres of the wool to the surface, and lay them all in one direction. When the whole web had been gone over in this manner it was handed over to the 'clipper,' whose apparatus consisted of a long narrow stool or bench, the top of which was cushioned, and a pair of large and peculiarly shaped shears, about eighteen inches long in the blades, and curved to fit the top of the cushion. These shears, which had a spring like the common wool-shears to open the blades, smoothed a considerable portion of the surface at every clip, and could be used pretty rapidly by an expert workman. Owing to their large size and peculiar form, there was some difficulty in getting them properly ground, which was at length overcome by the erection, at Galashiels, by subscription, of a large grindstone, to which all the manufacturers in the district sent their shears once a-year to be ground, a professional cutler being brought from Sheffield to do the work, which occupied him from a month to six weeks." The cropping is now done by a machine of American invention. The raised fibres are neatly and evenly shorn by the cloth being passed under a small roller, on which a series of steel blades are arranged in a spiral form. By repeatedly raising and cropping the cloth a very fine surface may be given to it, but that can be done only at the expense of damaging the fabric, and taking real value out of it; and in making tweeds these operations are usually limited to the extent of merely giving the surface a slight dressing, so that the texture of

the cloth is left unimpaired. Some years ago, however, it was considered necessary that every thread in a pattern should be seen; and in order to produce that result the cloth had to be much raised, and cut very closely.

The cloth is finished by being pressed between warm mill-boards in a hydraulic press of great power, and, after a final careful examination, is measured and rolled up ready for the market.

A set of carding-engines, with the other necessary machinery, produces annually about 1000 pieces of cloth, or 50,000 yards; and the total production of the trade, including goods made from bought yarns, may be roughly estimated at about 17,000,000 yards.

There are about 3000 yards of thread—1500 each way, warp and weft—in a yard of cloth of average weight; so that a man in a complete suit of tweed, with tweed overcoat, carries about with him rather more than twenty miles of woollen yarn. The weight of a yard of the thinnest tweed made for summer wear is about seven ounces, while that for winter use ranges as high as eighteen, and even twenty ounces. A fair average weight of cloth for each season, summer and winter respectively, is about ten ounces and fifteen ounces a-yard.

There is no fixed scale of wages in the tweed trade, and the rates vary considerably, not only in the different centres, but in the factories of individual towns. In few if any other branches of industry are female workers paid so liberally—indeed, their wages are little below those of the men. According to one statement, the women employed in the weaving department earn on the average about 12s. a-week, but superior hands occasionally make from 16s. to 18s. Another statement places the average at 11s., and the highest at from 14s. to 15s. Male operatives receive from 16s. to 20s. a-week, according to the department in which they are employed. Men in charge of departments have a shilling or two more. It will thus be seen that a family in which the father, and, say, three sons or daughters are at work—and that is no uncommon case—enjoy an income equal to that of many persons who have to maintain a far higher social position.

A fact worthy of notice, and one that does not fail to strike observant persons visiting the tweed manufactories of Scotland, is their superiority in a sanitary point of view over almost any other works of the kind. The occupation itself is a peculiarly healthy one, particularly in the carding departments, where the equal temperature necessary for the work, and the amount of oil held in the atmosphere, are said to present peculiarly favourable conditions for

a certain class of invalids. The fact was first taken notice of by the late Dr M'Dougal, of Galashiels, and fully corroborated by the further investigations of Sir James Y. Simpson. It is by no means unusual in the tweed districts for persons suffering from or threatened with pulmonary disease to seek employment in the manufactories as a means of cure, or of protection against that malady.

In almost every establishment in the trade there is a sick society and a saving society. The sick society is merely a mutual insurance against loss in the event of being laid off work, each member contributing a small weekly sum, thereby earning a title to so much per week in case of sickness. The saving society is not intended for permanent savings, but only a temporary provision for setting aside small periodical sums against rent and other domestic contingencies. Both societies are dissolved yearly and started afresh. This enlightened regard for mutual interests sometimes goes much further. A slight misfortune befalling any of the class is certain to set a subscription afoot; and in some establishments it is customary to subscribe towards the marriage providing of a girl leaving her employment to undertake housekeeping.

Trade unionism, if not a thing unknown, has seldom or never exercised its power for evil in the trade; and it says a good deal for the general intelligence of those employed—and perhaps something, too, for the employers—that the trade has suffered less from strikes than almost any other in the country.

It is not known when hand-knitting was invented, but that it was practised in very early times is proved by certain passages in the works of the most ancient writers. For instance, in Homer's "Odyssey," Penelope is represented as weaving a web by day, which she unwove at night; and the process of unweaving is considered to be more applicable to a knitted fabric than to one constructed on the loom, since more time would be required to undo a piece of woven stuff than would suffice to make it. No direct historical mention is, however, made of knitting until the reign of Henry IV. About the middle of the fifteenth century the peasantry of England and Scotland began to wear knitted instead of woven woollen caps; and by an Act of Parliament passed in 1488, the price of a knitted woollen cap was fixed at 2s. 8d., or 8s. of our money. In several subsequent Acts, reference is made to woollen caps; and from "the statute of servants," passed in 1563, it would appear that a woollen cap was an enforced badge of poverty or of service. The statute enacted that "every person not being possessed

of twenty merks (L.13, 6s. 8d.) rental should wear on Sundays and holidays, when not on travel, a woollen knit cap, on pain of forfeiting 3s. 4d. (10s.) a-day." An Act of the Parliament of Edward VI. was passed in 1552, in which "knitte hose, knitte petticoats, knitte gloves, and knitte slieves," are mentioned, so that the art of knitting was not confined to the making of caps. The manufacture of woollen hose and caps by the knitting process is supposed to have been first practised in Scotland; at least it is certain that it was done in Scotland before it was in England.

When knitting became known in this country, it was readily adopted as a pleasant and profitable domestic employment. Upwards of three centuries ago the wives of Scotch peasants knitted all the stockings they and their families required, and used the bark of the alder to dye their yarn—a practice not yet obsolete. Until the introduction of tambouring, crochet, tatting, and other modern styles of working in thread, knitting was recognised as an accomplishment befitting every rank of life; and the young lady of the last century felt as much pride in being considered a good knitter of stockings as her modern sister can do in being pronounced a mistress of the more ornate but perhaps less useful occupations which have supplanted knitting.

The first considerable seat of the hosiery trade in Scotland was Aberdeenshire. In the beginning of last century many persons in that county were engaged in making stockings, which were chiefly exported to Holland, and thence dispersed throughout Germany. The spinning and knitting were done by hand in the homes of the people, and a number of merchants were established in the town of Aberdeen, who gave out the wool and received the stockings ready for the market. The extent of this branch of industry a hundred years ago may be judged of by the following passage in "Pennant's Tour of Scotland:"—"Aberdeen imports annually L.20,800 worth of wool, and L.16,000 worth of oil. Of this wool are made 69,333 dozen pairs of stockings, worth on the average L.1, 10s. per dozen. These are made by country people in almost all parts of the county, who are paid 4s. per dozen for spinning, and 14s. per dozen for knitting, so that L.62,400 is paid annually in the shape of wages. About L.2000 worth of stockings are made annually from wool grown in the county." Other manufactures sprang up in Aberdeen, and at present the hosiery business is comparatively insignificant. Hawick is the headquarters of the trade, and years ago had become famous for the excellence of its stockings. The manufacture of hosiery is also carried on to a considerable extent at Dumfries.

It would appear, that up till the year 1771, all the hosiery made in Scotland was knitted by hand on "wires;" for though the stocking-frame had been invented nearly two centuries before that time, there was such a strong prejudice against it that no one would venture to introduce it.

The story of the inventor of the stocking-frame forms one of the saddest chapters in industrial biography. A meagre version of it, in which the invention is assigned a romantic origin, is familiar to most people, but not so the authentic memoir. A "History of the Machine-wrought Hosiery and Lace Manufactures," written by Mr William Felkin, of Nottingham, and published in 1867, contains the most complete and reliable record of the life of the ingenious but unfortunate William Lee that has yet been produced. Setting aside the incident which is said to have induced Lee to think of devising a knitting-machine, the facts which are placed beyond doubt are briefly these:—William Lee having completed his University course and become curate of Calverton, in Nottinghamshire, his native village, devoted the leisure of three years to working out an idea which he entertained of the possibility of superseding the process of hand-knitting. In prosecuting his invention, he is said to have expended a large portion of his patrimonial means. He believed that if he succeeded in getting the machine to work, he would acquire a large fortune; and, buoyed up by that expectation, he persevered in his task. When he at length completed the mechanical knitter, or "knitting-frame," as he chose to call it, he resigned his position and duties as a clergyman, and in company with a brother began the business of hose-making. Though the machine in its first form enabled one person to do as much work as six of the most expert hand-knitters, there was a strong prejudice in the public mind against any contrivances which were designed to supersede or lessen the demand for hand labour. Lee was satisfied that his invention was not only practicable, but that it was destined to achieve great results; and he removed his machine to London, taking along with him those of his relatives who had acquired the knowledge of knitting on the frame. Great interest was awakened in London when Lee's arrival became known. He sought the patronage of royalty through Lord Hunsdon, and Queen Elizabeth graciously consented to inspect the knitting-frame. Having done so, Her Majesty expressed her sense of the ingenuity displayed by the invention, but, to Lee's mortification, showed marked disappointment that, instead of fine silk hose, as she expected, the machine was shown at work upon a coarse worsted stocking. Notwithstand-

ing this untoward circumstance, Lord Hunsdon had faith in the importance of the invention, and pressed his conviction on his royal mistress, begging that a patent of monopoly might be issued to the inventor. Elizabeth's answer was in the following terms:—"My Lord, I have too much love for my poor people who obtain their bread by the employment of knitting, to give my money to forward an invention that will tend to their ruin by depriving them of employment, and thus make them beggars. Had Mr Lee made a machine that would have made *silk* stockings, I should, I think, have been somewhat justified in granting him a patent for that monopoly, which would have affected only a small number of my subjects; but to enjoy the exclusive privilege of making stockings for the whole of my subjects is too important to be granted to any individual." Lord Hunsdon marked his own appreciation of the invention by indenturing his son as an apprentice to Lee; and thus Sir William Carey, a knight, the son of a Peer, and of the royal blood, became one of the first stocking-maker's apprentices. Fully conscious of the importance—nay, the necessity—of securing the royal favour, Lee set about adapting his machine to the knitting of silk hose. In 1598 he succeeded in constructing a frame that would accomplish the desired object. There was no difference in principle between this machine and the first made; but, instead of having only eight needles to the inch, it had twenty. When the machine was completed, Lee worked a pair of fine silk hose, which he presented to Elizabeth, and was no doubt full of expectation that he would secure Her Majesty's favour now that he had fulfilled the requirements, the absence of which had prevented him from obtaining a patent for his first machine. The hose were accepted by the Queen, but the only reward the inventor received was a formal expression of satisfaction with the elasticity and beauty of the stockings. These repeated disappointments, added to the indifferent treatment which he received on almost all hands, caused Lee to fall into a deep melancholy. He then showed his machine publicly, and offered it to his countrymen, but they, instead of accepting his offer, despised him and discouraged his invention. Henry IV. came to hear of the stocking-frame, and invited the inventor to France, promising as an inducement certain privileges and honours. Lee accepted the invitation, and soon afterwards established himself at Rouen, where he set up nine frames, and met with a most encouraging reception. Good fortune appeared to be dawning on Lee, and he had begun to forget the ingratitude of his countrymen; but when the way to prosperity seemed to lie open before him, he was again



bitterly disappointed. Before he had secured the promised privileges his royal patron was assassinated, and the protection of the court was withdrawn from him. Finding himself unprotected in a foreign country, and left to bear the pangs of a wounded spirit alone, he wrote from Paris asking his brother, who had taken charge of the factory at Rouen, to come to him. It was too late, however, for, before the arrival of his brother, the inventor of the stocking-loom, almost an outcast from his native land, and an alien in France, had died of a broken heart in Paris, and was already buried there.

James Lee returned to Nottingham soon after his brother's death, and, in company with a man named Aston, who made improvements on the knitting-frame, established a manufactory of the machines. The value of the invention now began to be appreciated, and numbers of frames were set up in London, Godalming, and elsewhere. In the course of the seventeenth century the framework-knitters formed themselves into a union, for the purpose of regulating prices, and opposing the employment of persons who had not served a regular apprenticeship. The society was incorporated by a charter granted by Oliver Cromwell. There were only 650 frames in England at that time, three-fifths of which were employed on silk work, stockings, waistcoat pieces in colours, and trouser pieces. During the succeeding twenty years the number of frames greatly increased, and many were exported. In accordance with a clause in the framework-knitters' second charter, granted in 1663, such exportation was illegal, and various measures were resorted to in order to stop it. The society enjoyed a considerable income, and spent large sums in expensive pomp and pageantries. A carriage was provided for the master, and gold lace liveries for beadles and attendants, and among other accessories of the society were a gilded barge, a large band of musicians, flags emblazoned with the arms of the trade, and a splendid hall in which they held their feasts. They overdid the thing, however, got into debt, and made such heavy levies of money to support the extravagant style which had been adopted, that many of the members went to the midland counties to prosecute their calling. In 1727 there were 2500 frames in London, and 5500 in the provinces. Frequent disputes occurred in the trade, as the masters would not submit to certain of the bye-laws of the incorporation. In 1753 a Select Committee of the House of Commons was appointed to investigate and report upon the action of the society. The committee reported, among other things, that, in their opinion, "the bye-laws of the Company of Framework-Knitters were injurious and vexatious to the manufacturers, and tended to the discouragement of industry,

and to the decay of the said manufacture." From that time the company ceased to exercise any influence on the trade at large, and existed merely as one of the incorporated trades of London.

Though the manner of forming the loops invented by Lee remains the same as in his original machine, many improvements have been made in the other portions of the frame, and it has been adapted to a great variety of purposes, the most important, with the exception of hosiery, being the making of lace. In Nottingham, which is the chief seat of the framework-knitting trade, about 200,000 persons are employed in making hosiery and lace, and the annual value of the goods produced is over L.8,000,000. A return, made in 1866, showed that the number of persons employed in making hosiery in Britain was 150,000, and that the value of the machine-made lace and hosiery was L.13,000,000 annually. A large proportion of the frames are now driven by steam, which was first applied in the trade about the year 1838.

The stocking-frame was introduced into Scotland about the year 1771. The only distinct mention of the fact occurs in the "Annals of Hawick," where it is recorded that the working of stockings by frame-knitting was begun in that town by Bailie John Hardie in 1771. Arnot, in enumerating the manufactures carried on in Edinburgh and its neighbourhood in 1777, mentions stocking-making on frames; but not until thirty years after that date could the trade be said to be fairly established as a branch of the woollen manufactures of Scotland. Bailie Hardie began operations with four frames, on which only linen and worsted stockings were produced up till 1785, when lamb's-wool yarn was employed; and for about fifteen years after that date, all the yarn used was spun by hand. In 1791 the hosiery trade of Hawick employed fourteen men and fifty-one women, and the frames were twelve in number. The goods produced in that year were 3505 pairs lamb's-wool and 594 pairs cotton and worsted hose. When carding-machinery was introduced at Galashiels, the Hawick hosiery makers sent their wool thither to be spun, the means of transit being a pony with panniers. By 1812 the hosiery trade of Scotland had increased to such an extent that the number of frames employed was 1449, dispersed over thirty-eight different towns and villages. A general census of the trade was taken in 1844, from which it appeared that there were in Scotland 2605 frames, distributed as follows:—Hawick and vicinity, 1200; Dumfries and vicinity, 500; Edinburgh and vicinity, 150; Glasgow and Kilmarnock, 280; Sel-

kirk and vicinity, 128; Perth, 108; Langholm, 92; Denholm and vicinity, 87; Jedburgh and vicinity, 60. Of these, 620 were not at work. It does not appear that at any time the number of frames in Scotland was greater than in 1844. The number at present in use does not exceed 1600, of which 900 are in Hawick, and about 400 in Dumfries. In both towns power-frames are at work; and though the aggregate number of frames may be smaller than five and twenty years ago, the productive power is greater, as many of the frames are of the broad kind, and work six pieces at a time.

Messrs William Elliot & Sons, Hawick, are the leading firm in the Scotch hosiery trade. Their chief productions are Cheviot wool stockings, drawers, and undershirts, and they employ 617 men, women, and children; of whom 66 are employed in the manufacture of yarn, 70 are winders, 285 stockingmakers, 95 seamers, and the remainder are employed in the finishing department. The spinning and knitting are conducted in separate factories. On the floors of the knitting-factory, the frames, which are worked by hand, are ranged on either side, each being opposite a window, as a good light is indispensable to the workmen. Though to the uninitiated the knitting-frame appears mysterious and complicated in its working, it is simple in construction, and the process of knitting by it is easily learned. The workman sits on a high stool with his feet resting on a series of treadles, which produce certain of the eleven movements necessary to form each row or "course" of loops. With his hands he places the yarn over the "needles," and works a pair of levers, which complete the operation. The ribbed tops of stockings, bottoms of drawers, and wristbands of shirts, are worked on a frame specially devised for the purpose, and the men who make them earn the highest wages in the trade. A system of dividing labour prevails to some extent—a stocking, for instance, goes through the hands of three persons before the knitting is completed. The occupation of the machine knitter is little different from that of the hand-loom weaver, and the amount of muscular exertion required is about the same. It is considered a healthy trade, as the air in the workrooms is kept at an equal temperature, and no deleterious substance is used in any of the operations. From the knitters and seamers the work passes to the scourers and finishers, and is by them made ready for the market.

The only "fashioned" hosiery factory worked by steam-power in Hawick is that of Mr John Laing. The goods produced are of the finest class, being chiefly underclothing made from merino yarn and spun silk—a branch of the trade which has extended considerably

during the last few years, and was never in a more prosperous condition than at present. The merino yarn used is got from Pleasley and Nottingham. The knitting-frames are of the finest construction, and so large that six shirt pieces may be knitted at one time. By the application of steam-power the operatives' labour is reduced to a mere act of supervision, and some of the frames are in charge of women. Mr Laing is exceptional in paying his hands at a weekly rate. Men receive from 14s. to 20s., and boys and girls from 4s. to 10s. Messrs Dicksons & Laings, Hawick, also employ a large number of frames worked by power; but the goods they produce are chiefly of a coarser kind.

The relations between the employers and employed in the hosiery trade have not in general been of a satisfactory kind. During the period from 1810 to 1840 the trade in England was in a critical condition. Too many persons had rushed into it, the markets were overstocked, prices fell, and great destitution prevailed. Matters were complicated and feeling embittered by the action of the Luddites, who thwarted the efforts of those who, by introducing improved machinery, endeavoured to set the trade on a new and better footing. A reliable authority says:—"We do not hesitate to affirm that the actual sufferings and privation experienced during the Lancashire famine of 1863-66 were far less than the distress in the midland hosiery district during the period between 1810 and 1845, when it became a widely spread practice to still the cravings of hunger in the adult by opium taken in a solid form, and in children by Godfrey's cordial." No trade ever endured such a severe and prolonged state of depression; and in groping about for remedies, some most injudicious things were done. The guardians of the poor in certain districts actually induced men to take work at whatever they could get for it, and their wages were made up out of the rates. The full earnings of those who got work ranged from 5s. to 7s. 9d. a-week of sixty, and in some cases of seventy-two hours. As the peculiar circumstances which brought about the crisis in England did not exist in Scotland, the trade north of the Tweed was not seriously interfered with. When better days dawned on the English hosiery makers, and improved machinery was introduced with the most satisfactory results, the Scotch manufacturers wished to maintain their place in the market by adopting the improved frames. In that desire they were strenuously opposed by the workmen, and no attempt was made to bring in the machines until 1855, and even then it was found impossible to get men to work them. The new frames were more costly than the old, and the masters claimed a return on their

capital in the shape of a reduction on the price charged by the men for making stockings, &c., which they considered the workmen could well afford to allow, since the rate of production would be so much increased that a man might, even at the reduced price, make something like ten or twelve per cent. more wages than he could earn at the old frame. The men would have the new frames if the old rates were retained, but not otherwise, and no definite arrangement has been come to.

It has been customary in the trade from its earliest days to charge a certain sum weekly in the shape of "frame rent," and this has long been regarded as a grievance, the men considering that they should be put on the footing of workmen in other trades, whose employers provide machinery free of charge. The usual rent of a narrow frame is one shilling a-week, which is deducted from the wages, together with a small charge for oil and gas. There is something antiquated in this system of charges, as well as in other matters connected with the trade; and whether the present generation of masters and workmen be conscious of it or not, they are maintaining a position disadvantageous to both. If they would sink their mutual animosities, and modernise their system of working, they would certainly improve their positions. A Board of Arbitration and Conciliation was formed in Hawick in 1867, on the model of similar bodies in Nottingham and Leicestershire. The Board consists of nine employers and nine workmen, and a neutral gentleman officiates as referee. So far, the only result that has followed the deliberations of the Board has been the abolition of the "Hawick Hosiery Trade Society" for all purposes save those of a charitable nature. This is a step towards an improved relation between parties, and more good is likely to follow.

The Hawick stocking-makers are better paid than their brethren in the midland counties of England, or other Scotch towns where the manufacture is carried on. There are so many different qualities and classes of work, that it is not easy to quote an average of wages; but it may be struck at 18s. a-week for the broad frames, on which underclothing is made, and 13s. to 14s. a-week for the narrow frames. Men employed on the "rib frames," on which the tops of stockings, and wristbands of shirts, as well as ribbed underclothing, are made, can earn from 30s. to 35s. a-week. The average value of work turned out by each worker on the broad frame is L.6 weekly, and on the narrow frame L.3 weekly.

The quantity of wool manufactured into hosiery in Hawick annually is upwards of 1,000,000 lb., and the value of the goods produce

about L.130,000. A considerable quantity of hosiery yarn is spun in Hawick, which is not woven there. It is sold to manufacturers elsewhere, and a large proportion finds its way to Leicester, where an imitation of "real Hawick hosiery" is produced. The stocking-makers are generally an intelligent class of men, and take much interest in public questions. Many of them are keen politicians, and when occasion serves, can give sensible expression to their views. Some, however, take too great advantage of the liberty which working by piece instead of by fixed wages confers, and idle away all their time except what it is absolutely necessary they should devote to labour, if they would keep the wolf from the door. The records of the local courts show that others prefer game-trapping, salmon poaching, and the excitement of the public-house, to the "whirr" of the frame. These, it is pleasing to add, are the exceptions, and it may be said of the greater number of those engaged in the trade that no class of workmen live more honourably and respectably, or bring up their families more comfortably and creditably.

The use of tapestry and embroidered cloths as a covering for furniture and the floors of rooms is of great antiquity. The Babylonians, Parthians, and Gauls, were famous for embroidering carpets in different colours, and several cities early acquired a celebrity for the manufacture. The carpets were usually made with a woolly nap on one side, but occasionally the nap was raised on both sides, and the design enriched by the insertion of threads of gold and silk. The names of distinguished makers of carpets have been handed down along with those of the cities in which they plied their vocation. Pathymas, an Egyptian, with Acesas and Helicon, of Cyprus, were among those who obtained eminence in the art, and it is conjectured that the two latter worked under the direction of Phidias, the famous sculptor. Plato mentions that it was customary in Greece to cover couches with carpets, and place others on the floor. The wealthy patricians of Rome used purple carpets, for which they paid fabulous prices. Babylonian covers for couches were sold in the days of Metullus Scipio for L.4600 each, and that price was quintupled in the time of the Emperor Nero. Carpets figured conspicuously in the pageantries of the ancient nations in the East. They were used to deck horses and elephants in triumphal processions, and respect for the dead was marked by placing carpets on tombs and cenotaphs. In Turkey carpets were used many centuries ago in the same manner as at present. The skill of the natives of India in working textile fabrics is universally admitted; but, perhaps, in none of their produc-

tions have they displayed so much ingenuity and taste as in embroidering carpets. The finest work of the kind is executed by the natives of Seinde, but though much in demand among the princes and chiefs of India, those carpets are too gorgeous and expensive for European tastes. In the most costly the design is tamboured in cloth and canvas with threads of gold, silver, and silk. The only Indian carpets used in Britain are a thick soft kind made in Masulipatam.

Carpets were introduced into this country from the East some time during the twelfth century, but as they were very costly they were brought into use only on extraordinary occasions. The Norman practice of spreading rushes on the floors continued to be followed up till the close of the sixteenth century. About that time the working of tapestry had grown to be a fashionable occupation among ladies of the upper ranks, and walls of houses came to be decorated by elaborately worked devices. Clay floors gave place to wood planking, and mats and rugs of home manufacture were spread out on convenient spots. As time wore on the growing taste for soft coverings to the floors of the more important rooms in the houses of the wealthy led to the introduction of the manufacture of carpets.

The merit of originating the manufacture in England is claimed for one of the Earls of Pembroke, who, observing the tendency of public taste, and being desirous to improve the condition of the weavers in Wilton, induced a skilful French carpet-weaver to be smuggled over from France in a sugar cask, in order that he might teach the weavers. It was not until towards the middle of last century that the manufacture was fairly established in this country. The manufacturers of Kidderminster, who had previously become famous for the excellence of their broadcloths, turned their attention to making carpets, and by the year 1735 had succeeded to such an extent that they gave promise of attaining as great celebrity for carpets as for broadcloths. The kind chiefly made at first was that known as "Brussels" carpet, but subsequently a cheaper fabric was invented, which, under the name of "Kidderminster carpet," became very popular, and is yet much in request.

The date at which carpet-weaving was begun in Scotland cannot be stated exactly, but it is certain that the trade was of limited extent until an enterprising firm in Kilmarnock took it up in 1777, and laid the foundation of the celebrity which that town has since enjoyed for its carpets. Kilmarnock was not long in rivalling Kidderminster, and forty years ago had nearly a thousand looms employed in weaving Brussels, Venetian, and Scotch carpets. The average annual value of the carpets made in Kilmarnock during the past forty or fifty years

has been over L.100,000. Though Kilmarnock has occupied the foremost place in the trade, a considerable quantity of carpeting is manufactured in other Scotch towns—chiefly Glasgow, Paisley, Bannockburn, Aberdeen, and Ayr. The manufacture had been introduced and had flourished for a time in a number of towns in which it is now unknown. Edinburgh, for instance, early possessed a carpet factory, and one firm in the city is identified with an important improvement in the manufacture. Now, with the exception of a small factory at Canonmills, the trade is extinct in the city itself, having been transplanted to the neighbouring village of Lasswade about thirty years ago.

In 1825 it was estimated that there were between 1000 and 1200 carpet weavers in Scotland, and of these about 800 were in Kilmarnock. Each weaver produced about six yards of carpet a-day, and was paid at the rate of  $3\frac{1}{2}$ d. to  $4\frac{3}{4}$ d. a-yard. The selling prices of the goods ranged from 2s. 9d. to 3s. 9d. a-yard. A considerable quantity was exported to the United States, and the other markets beyond Scotland were London and Dublin. In 1840, 900 looms were employed in the carpet trade, and the wages of the weavers were from 11s. to 18s. a-week.

The Society of Arts did much to encourage the extension and improvement of carpet manufacture in England, and it was under their auspices that carpets in imitation of those of Persia and Turkey were first made by a manufacturer of Axminster. Though this kind of carpet retains the name of Axminster, that town ceased its active connection with the trade many years ago, and Wilton is now the chief seat of the manufacture. In Scotland, the Board of Trustees for the Encouragement of Manufactures granted premiums to carpet makers, which resulted in the introduction of new branches of the trade. Mr Thomas Morton, of Kilmarnock, was one of the principal pioneers of improvement in the manufacture. He devised a number of appliances which tended to better the quality of the goods produced; but his most important invention was the triple carpet fabric which now bears the name of "three-ply Scotch carpeting." The Kidderminster carpet—also called Scotch—consists, so to speak, of two layers or webs, the design being produced on both sides, but with the colours reversed. This carpet is light and cheap; and Mr Morton sought, by increasing its substance, to make it approximate more closely to the Brussels fabric. He accordingly added a layer, making the carpet at once thicker and softer, and admitting of a third colour being introduced in the design. An honestly made carpet of this kind is almost as durable as one of



Brussels make, and has the advantage of a double presentment. Usually one side is brought out darker than the other, and it is customary to have the light side uppermost in summer and the dark side in winter. Before the Jacquard apparatus was applied to carpet weaving in this country, the "heddles" were moved by a "draw-boy," who could not always be relied upon for accuracy of work. Mr Morton superseded the office of the draw-boy by applying to the heddles a revolving drum studded with pins, a contrivance which answered its purpose admirably, until it was superseded by the Jacquard machine.

The Board of Manufactures having got the making of Brussels carpets established as a branch of industry in Scotland, next devoted attention to the introduction of the art of producing carpets similar to those made in Turkey. In 1830 the Board offered two prizes, of L.150 and L.50 respectively, as inducements to the introduction of the manufacture of carpets of the kinds referred to. At the same time, other prizes to the amount of L.115 were offered for improvements or excellence in carpets of the varieties then made in the country. In 1832 the committee of the Board reported that great and unexpected success had attended the offering of premiums for Turkey carpets. The winner of the highest premium—whose name does not appear in the committee's report—had made a splendid start, and had written to say that he was grateful to the Board for having originated a new branch of trade, and stating that he had orders for as many carpets as he could make in nine months. Premiums were next offered for Persian and French tapestry carpets, and those fabrics were soon afterwards introduced. The Scoto-Persian carpets made by Messrs Richard Whytock & Co., of Edinburgh, and Messrs Gregory, Thomson, & Co., Kilmarnock, were considered equal in quality to any produced elsewhere, and became popular among the wealthier classes of society.

The Brussels carpet possesses peculiar beauty. A large number of colours may be introduced, and considerable scope is thus given to the designer; but the special attractions of the fabric are its softness, elasticity, durability, and the richness of appearance imparted to it by the cord-like arrangement of the texture. Brussels carpet may be said to consist of two webs woven simultaneously the one over the other, but both firmly united. The lower web consists of a strong groundwork of linen and worsted, and the upper of the solid woollen "pile." The best carpets of this kind are composed of six layers of worsted warp, each containing 260 threads. Only one-sixth part of the warp appears on the surface, so that five-sixths

of the substance of the web as well as the linen weft are unseen ; but portions of all the worsted threads are thrown up at intervals, as the colour they bear is required in the design. As all the surface of the carpet is composed of warp—that is, threads running continuously from one end of the web to the other—it will be seen that each colour, no matter how small a part it may play in the figuring, requires a series of threads of the full length of the web. The layers of warp are arranged in “frames,” and thus Brussels carpets are spoken of as being “six-frame,” “five-frame,” or “four-frame,” according to the number of layers of yarn, the kind in which most material is used being, of course, the most valuable. It may be useful for purchasers to know that large quantities of “three-frame” and even “two-frame” Brussels carpets are now being made ; and that, consequently, there is quite as great a difference in the quality as in the price of the highest and lowest makes. The cord-like loops of the carpet are formed by wires, which are inserted and withdrawn at the proper time by an ingenious and beautiful piece of mechanism attached to the loom. The Jacquard apparatus is now generally used in producing the design. Large quantities of Brussels and Wilton carpet are made for home use and exportation at Glasgow and Kilmarnock. The difference between the Brussels and Wilton carpets is that, while in the former the raised loops of worsted are left entire, in the latter they are cut, so that the surface has a velvety appearance. The only difference in the manufacturing process is that the wire which holds up the loop while the weft is being thrown in has a knife blade attached to one end, and as the wire is drawn out the blade cuts the loop.

The high price of Brussels carpet of good quality has operated against its obtaining such an extensive demand as its beauty and elasticity would otherwise have secured for it ; and at various times, in different places, attempts have been made to produce a kind of carpet which, while it should require less material for its fabrication, should retain the appearance and softness of “Brussels.” None of those attempts were successful until Mr Richard Whytock, of Edinburgh, took up the problem, and invented his patent tapestry and velvet-pile carpet, which more than realised the objects sought. The tapestry carpet, while consisting of only one layer of worsted warp, may be made to show any number of colours and shades ; and its corded surface gives it the richness of texture presented by the best Brussels fabric. Mr Whytock worked out his invention in his factory at Lasswade ; and so highly were his labours appreciated, that his patent was extended for five years beyond its original period.

He granted licenses to Messrs Crossley & Sons, of Halifax, and Messrs Pardoe, of Kidderminster, and thus the manufacture was introduced into England. The firms named found a ready demand for the new carpet, which yet retains great popularity. Considering its price, it is perhaps the most beautiful and durable carpet made. Mr Whytock retired from the carpet manufacture a number of years ago, and his invention, having become common property, is now practised in various parts of England and on the Continent.

Instead of working out the pattern by a limited series of coloured threads extending from end to end of the web, Mr Whytock divided each thread into a number of longitudinal sections, corresponding with the number of loops to be formed in the length of the carpet. He then imparted to each section a colour suitable to the part it would occupy in the design. Thus, if a thread be drawn out of a tapestry carpet, it will be found to possess many hues, and the space occupied by the respective colours will be seen to differ considerably. At one part there is a bit of green to contribute to the formation of a leaf, next a bit of white for the full-blown flower, and again a small spot of crimson to form the tip of the opening bud—longer or shorter sections of the ground colour coming in between. It is almost impossible to estimate fully the amount of patient thought, minute calculation, and mechanical skill which must have been exercised in bringing this invention to perfection.

Mr Hugh Miller took much interest in Mr Whytock's labours; and in an account of a visit which he paid to the factory at Lasswade, says:—"Every carpet consists of repetitions of certain sets of patterns, and so there must be a recurrence of the same sort of threads. But no two threads barred in exactly the same fashion go together. There is a continual variation, on whose nice adjustment the integrity of the pattern depends—and hence the necessity of much care and correctness in the calculations. In the thread, too, the bars of colour have to be broader in a certain proportion than it is intended they should seem in the cloth, as allowance has to be made for the amount of thread lost in the loop or pile which forms the surface; and so the pattern in the warp has to be made quite a different sort of thing from the proposed pattern in the web. Hence another set of difficulties. But this plan appears to have succeeded in overcoming them all, and in producing in the Brussels tissue patterns of even greater beauty than in the many-ply carpets woven in the common style. We were much interested in this establishment at Lasswade to see how simple were the operations performed by each set of the mechanics in the different departments,

and yet how regularly the complicated whole grew under their hands. One set of workmen were employed in carefully barring across with colour layers of threads spread on huge cylinders—another set were engaged in fixing the dyes—a third set, in setting up the threads after a given manner for the warp of the projected web—a fourth, in weaving. All of them seemed to be workers in the dark, so far as the pattern was concerned; they merely measured off certain bars of colours after certain given proportions, or stretched in a particular given fashion a certain number of threads across a frame; or, when stretched and arranged, weaved them into a web; and yet the pattern sprung up before them complete in every sprig, leaf, and petal, as if it had been as much a thing of spontaneous growth as the mosses and wild flowers of our woods and moors.” By cutting the loops, as in the case of the Wilton carpets already referred to, the tapestry may be converted into a velvet pile carpet. Twelve years ago, 600 power-looms, producing 10,000 yards a-day, were employed in making Mr Whytock’s carpet, and since that time the demand has largely increased.

Messrs James Templeton & Co., of Glasgow, are among the most extensive carpet manufacturers in Scotland; and, like Mr Whytock, Mr Templeton has won distinction by his inventive genius. Turkish carpets used to be made by knotting the worsted to the warp by hand, a clumsy and tedious process, involving much labour and expense. Mr Templeton considered that carpets equally good, and presenting the chief characteristics of the Persian or Turkish fabrics, might be made by machinery at a considerably reduced cost, and resolved to put his idea to a practical test. He succeeded beyond expectation; and how he accomplished his task will be made plain in the course of a brief account of what came under notice during a visit to the extensive factory of the firm at Greenhead, Glasgow, in which upwards of 500 operatives are employed. The carpets, which are principally made to order, are woven in one piece. When purchasers go to the expense of a carpet of this kind, they like to have something unique, so that often only one carpet is made of a particular design. In many cases the heraldic emblems of a family are worked in, and in others the ownership is marked by cunningly-devised monograms. Then it is necessary, in most instances, to impart to the carpet some special feature in order to bring it into harmony with the architecture of the room and the style of furniture. It will thus be seen that the designing department is one of the most important. Upwards of forty men and boys are employed in it, and the artistic taste and skill displayed by the superiors of the depart-

ment are highly creditable. The designs are drawn in colours on strong paper, marked off into squares each of which represents a stitch or dot in the carpet. It often happens that the carpets have to be made to fit irregularly shaped rooms, and in such cases great nicety of measurement and calculation have to be followed. Sheets of paper bearing the design are cut up into stripes of two rows of dots each, care first being taken to have them all numbered. These stripes of paper are sent to the yarn room, where a number of girls seek out a certain number of pirns of yarn of the required colours. The yarn is to form the weft of the carpet; but it has to undergo a preliminary weaving process, which converts it into "chenille," or furred cord. Yarn sufficient for twenty or thirty cords is woven in one web, which is afterwards divided longitudinally by a peculiar cutting machine. This preliminary weaving is done on hand-loom, and as a section of the pattern of the carpet has to appear on each cord, the chenille weaver has to work his web in bars of different colours and of various widths, being guided by the stripes of paper which accompany the yarn when delivered to him. In the variety of its colouring, the chenille cord somewhat resembles a thread of Mr Whytock's tapestry carpet. When the web is cut up a number is affixed to each cord, and after being wound into hanks, the cords are ready for the carpet weavers. The carpet looms are of gigantic dimensions—one of them having a width within the frame of thirty-four feet—and from four to six men are employed at each. A copy of the design, with the rows bearing the same numbers as those attached to the chenille cords, is supplied to the weavers, who, after mounting the loom with a strong linen warp, weave in the chenille which is used as weft. Between the rows of chenille a "shot" of stout worsted is put in as a backing. Working those big looms is a tardy process, the shuttle moving slowly from hand to hand of the workmen, and a pause being made to adjust with a wooden comb the "fur" of each row of chenille, so that the dots of colour may assume their proper place in the design. When the carpet leaves the loom it is carefully examined, and defects are made good. It is then shorn by a machine similar to that used in shearing cloth; and when thus reduced to an even velvet-like surface, all its beauty becomes apparent, and not till then can the result of the operations described be fully appreciated. Mats and rugs are made in the same way on smaller looms, and the designs of some of these are remarkable for their chaste elegance.

Messrs Templeton & Co. were successful exhibitors at Paris last year, having obtained one of the two gold medals awarded to carpet

manufacturers in Britain. About one-fifth of the workpeople employed by the firm are females, who earn, on an average, about 10s. a-week. The weavers and other male operatives receive from 15s. to 30s. No special provision is made for giving an art training to the boys in the designing department; but those who show special aptitude for the work are encouraged to attend the School of Arts.

An offshoot of this firm is that of Messrs J. & J. S. Templeton, Milend, Glasgow. About 200 operatives are employed, and there is considerable variety in the goods produced. These are chiefly Brussels and Wilton carpets and rugs, silk and rep window hangings, and a variety of chenille carpeting patented by Mr John S. Templeton, in which the warp is formed of chenille cord, and the weft of linen, being the reverse of the mode followed in the parent establishment. A set of damask chair-covers of exquisite beauty were recently made by Messrs J. & J. S. Templeton for Windsor Castle. Upwards of 3000 persons are employed in the manufacture of carpets in Scotland, and the value of the goods of this kind produced in Glasgow alone amounts to L.150,000 a-year.

The manufacture of woollen goods is a prominent feature in the history of several important towns and villages in Scotland, and in order to make the record of that branch of industry as complete as possible, brief historical sketches of the principal seats of the trade are appended :—

**GALASHIELS.**—The earliest indication of the manufacture of wool in this town occurs in a charter, dated 1622, conveying the barony of Galashiels to the Crown. Among the pertinents of the barony the charter mentions a corn-mill and “waulkmills,” rights to hold fairs and markets, and other privileges of a burghal nature. These “waulk” or “fulling” mills, as they are now called, were probably entirely used for blankets and “kerseys” (coarse woollen cloth), made for consumption within the district. The site of the mills was probably on the haugh, where the present town is situated. At the date mentioned the population numbered about 400, and the bulk of the people were “mailin’ men,” holding “acres” from the baron of Galashiels by a feudal tenure of military service, and probably enough conjoined to their labour on their “crofts” the arts of dyeing and weaving the produce of the cottagers’ spinning-wheels. “The Forest” was as famous for its sheep-walks as for its deer-coverts, and abundance of wool would naturally lead in such inland situations to increase of spinning. In 1774 the whole wool used in Galashiels

was 792 stones, of 24 lb each. It was obtained in the district, and worked into blankets and "Galashiels greys," a coarse and inferior imitation of "Yorkshire medleys." There were 30 looms, 3 waulk mills, and 600 of a population at that date in Galashiels. Eighteen years afterwards—in 1792—the quantity of wool used was 2916 stones, which Dr Douglas, the minister of the parish at that time, calls "manufacturing to a great extent." Operations were then conducted to some extent on the factory system. The wool, after being roughly scribbled on the "dick"—a carding-machine driven by the foot—was carded into rolls and spun by women, who were paid at the rate of 6d. per "slip"—poor pay, indeed, when the spinning of a slip was a fair day's work. 100 slips can now be spun on the mule for 1s. 6d. In 1790 about 300 women were employed in spinning for the Galashiels trade. Ten years before, a "willy" for teazing the wool had been purchased as a joint-stock speculation by some tradesmen. It was driven by hand, and teazed wool for the whole town. The three waulk-mills which were in the town in 1774 were driven directly from the axles of water-wheels, and were either in the open air or under a boarded roof, so that when frost set in milling was suspended. One of the mills was on the site of the Waulk-millhead Mill, another on the site of Messrs J. & W. Cochrane's works, and the third where the works of the late Mr George Bathgate are. The united rental of the three was only L.15 a-year.

Without further allusion to the social condition of the community, it may be mentioned that at the time referred to, and for a number of years afterwards, apprentice dyers took their meals at their employers' tables, and the masters' daughters worked as hard as the other persons employed; while the heads of establishments either busied themselves at the works, with their coats off, or travelled to Edinburgh on foot to sell their goods. The trade owes much of its prosperity and importance to the indomitable perseverance and prudence of those respected pioneers.

The year 1790 saw the beginning of a new order of things. Carding-machines had been started in Leeds, and Mr John Mercer, of Galashiels, went to examine them. The result was that a scribbler was soon in operation in the town, and it was the first carding-machine started in Scotland. Wilderhaugh Mill was built for the machine, and was the first woollen factory, in the modern sense of the word, in Scotland. The venerable house was removed so recently as 1866 by Messrs Brown & Shaw, the proprietors of large works which now occupy the site. During 1791 the firm with which Mr Mercer was connected got from England a carder, a "billy" with

twenty-four spindles, and a spinning-jenny with thirty-six spindles. Mr James Roberts introduced a spinning-jenny with twenty-four spindles. Thus were the old, tedious, imperfect, and expensive hand processes superseded by a "set of machines" which, in all but one particular—perfect equality of yarn—made almost as good work as modern carding-machines. About that time feus were taken on the haugh, the site of the present town, and a cloth hall was started on a principle which enabled the depositor of goods to draw two-thirds of their value, leaving the remaining third to be lifted when the goods were sold. The parish minister, Dr Douglas, advanced L.1000 to aid the scheme; and though it was ultimately found to be impracticable, the memory of the good clergyman is much revered on account of the interest he took in the trade of the town; and his portrait, paid for by subscription, has been hung in the public hall. The new spinning-machines were in most cases erected in the garrets of dwelling-houses, and were driven by hand. They cheapened spinning, and made it possible to give any quantity of yarn the same amount of twine—a material thing in cloth to be much felted.

For many years afterwards the only notable events in the manufacturing history of Galashiels were the erection of factories on new feus on the haughs, and of dwelling-houses for the increasing population. A set of machines was a heavy speculation in those days of limited capital, and several firms were usually associated in one mill. In 1792 Mid-Mill (the nucleus of Messrs J. & W. Cochrane's works) was built; in 1798 Botany Mill was put up; in 1802, the Waulkmillhead; in 1803, Rosebank Mill; in 1804, Nether Mill; in 1818, Huddersfield Mill; in 1819, Galabank Mill; and in 1826, Wakefield Mill; and during those years some great improvements in machinery were also introduced. In 1810 Mr William Johnstone invented the "twiner"—an adaptation of the spinning-jenny—by which two or three threads could be twisted into one. In 1814 spinning "mules" were introduced by Messrs W. & D. Thomson, at what is now called Rosebank Mill, and these cheapened yarns considerably. Spinning "jennies" had previously been lengthened to 144 spindles, and were turned by water power; but the mule enabled one man to work 500 spindles, and earn much larger wages at rates per slip sixty per cent. less than were formerly paid. The "shearing" of the cloth had always been a difficult and expensive operation, being done by hand with a peculiar apparatus, requiring a good deal of dexterity to work it properly. In 1819 Mr James Paterson brought the "Yankee" from America, which at once simplified and perfected the shearing process. The principal trade up



till 1829 was the making of cloths of the kinds already mentioned from home-grown wool, but knitting-yarns and flannels were also produced.

The commercial disasters of 1829 fell upon the trade of Galashiels with peculiar force, and manufacturers were completely prostrated when they saw that their cloths—greys, drabs, and blues—were not likely to be again required in the home markets. Many experiments were made in that year to develop new branches of trade. Soft tartans—first made in the district by Mr Thomas Roberts, the gentleman who afterwards sent the “condenser” from America, as already related—and trouserings made from twists and mixed colourings, or tweeds, were the only new varieties of goods that were successfully produced. The soft tartan made by Mr Roberts was extensively used by the nobility and gentry for cloaks, dresses, and shawls. Three-fourths of the machines in Galashiels were kept going on tartan for six out of the twelve months for many years, and the goods paid better than tweeds have ever done. The tartans were principally made from foreign wool of different qualities—from the strong fleeces of Van Diemen’s Land to the finest Saxony lamb’s-wool. While some firms were chiefly devoted to this branch, others prosecuted the manufacture of mixed coloured trouserings; and in a few years the demand for both classes of goods was far beyond the productive power of the town. In 1828 the number of looms employed was 175, and in 1838 it was 265. The population in 1831 was 2100, and by that time a considerable portion of the modern town was built; banks, churches, and schools were founded; and since 1838 the trade has been continually increasing, while many mills elsewhere have been raised by gentlemen going from Galashiels. Hand labour has given place to machines in almost every department of the trade. The population is now close on 10,000, yet factory hands are always scarce, except in periods of temporary depression. The small carding-machines of 1780 have been put out of the way for the best and largest carding-engines that can be got anywhere; steam-engines are at every factory, some of them individually powerful enough to turn all the machinery that was in the valley in 1810; and the productive power of the town is represented by 76 sets of carding-engines, 58 of which are condensers; 25,508 spindles of self-acting mules, 36,982 spindles of common hand-mules, and 4336 spindles of throstles—in all, nearly 70,000 spindles. Assuming that the annual produce of one set of carding-engines is about L.7500, the annual production of the 76 sets will be L.570,000. Little or no home grown wool is used.

It is impossible to calculate the number of hands employed in the

factories ; but with the exception of the building trades, which are partly supported by work in other places, almost the entire population is maintained directly and indirectly by the staple manufacture of the town.

The general social condition seems superior in several respects to what prevails in some larger towns. Such a thing as squalid poverty is totally unknown. The rents paid for dwelling-houses by the operatives are from L.5, 10s. to L.7, 10s., and the scale of dietary is more costly than that of Scotch operatives generally. Building societies, co-operative provision stores, and annual sick and benefit societies, have long existed among the workpeople.

HAWICK.—The burgh records of Hawick bear evidence that manufacturing was conducted there so far back as 1640—how much earlier it is impossible to say, as there are no records prior to that date. But, as the earliest references to the “wobstairs” lead to the impression that they were, in proportion to the population, a numerous class, and show that more than two hundred years ago they were an incorporated body, it may be assumed that the shuttle was plied at the confluence of the Teviot and Slitrig by a peaceable population at the time the mosstroopers of the neighbouring peels occupied themselves in plundering brother-marauders south of the Border, and in trying to hold their own when the compliment was returned by the freebooters of Cumberland and Northumberland. If, however, the Scotts, the Elliots, and the Armstrongs, who followed their chiefs to the foray, recognised no authority but that of the doughty men who led them to plunder and to battle, the Town Council of Hawick appears from its records to have enacted and administered laws for the protection of the property of, and even the recovery of debts due to, the “wobstairs ;” while, on the other hand, care was taken that the weavers should do justly to the public.

Linen was the principal material woven in the middle of the seventeenth century, but woollen plaidings were also made. Many years after 1640, the weavers worked only on their own account to the orders of private customers, manufacturers owning looms and paying men to work them being then unknown. The yarns were prepared by hand cards and spun on the domestic wheel. There is, however, early reference to a fulling-mill ; but it was not till about the middle of the eighteenth century that a regular weaving shop was established. It was the property of a company, and linen

checks were made in it. At the same period wool was spun and sold for manufacture in other towns. A carpet manufactory was commenced in 1752. Weaving of linen tapes was begun by a company a few years afterwards, and the factory, now a stocking weaving shop, is still known as the Ince House, while the Under Common Haugh, where the tapes were bleached, is still termed "the bleachfield" by the older residents in its neighbourhood. Neither carpets nor tapes have been made for more than half a century.

As already stated, the manufacture of hosiery was commenced in 1771, and continues to be an important branch of trade, though the number of frames is not so large as it was some years ago. Originally the work was all of the "custom" kind. The first hosier who made goods for the general market was Mr John Nixon. That was in 1780. Mr Nixon did his own spinning as well as stocking-making; and as carding-machines were introduced to Galashiels before they were worked in Hawick, the wool was sent thither to be carded, and returned to be spun and woven. In 1804 Mr Nixon built Lynnwood Mill, where carding and spinning were carried on. The firm which he founded ceased to exist only four years ago by the retirement from business of his sole surviving son and partner, Mr William Nixon. Twenty-six years ago the younger Mr Nixon, having been left the only member of his firm, restricted his business to the preparation of yarns at Lynnwood Mill, and, though he remained owner of the premises, the hosiery department passed into the hands of Messrs Nixon and M'Kie—a house now represented by the junior partner, and conducting a large and high-class business. The premises were sold in 1868 to another firm in the hosiery trade—Messrs Robert Pringle & Sons.

Mr William Elliot, late head of the firm now represented by two of his sons, and of whose establishment, as occupying the leading place in the Scotch hosiery trade, some particulars have already been given, began business, as most of the hosiers did, on a limited scale, about the year 1820. He subsequently entered into partnership with the late Mr Thomas Wilson, and continued in that relation for seven years. The separation took place in 1830; and, after resuming on his own account, Mr Elliot gradually extended his business till, many years before his death in 1864, it was the most important in the country. It was a common saying that, keen politicians as the stockingmakers of Hawick always were, they looked forward with more interest to Mr Elliot's comments on the trade prospects for the spring, given at his annual factory festival, than to the speech

from the Throne at the opening of Parliament. At first he bought his yarns, and manufactured them, then he went into the wool market and secured the Cheviot clips best suited to his trade, got them spun elsewhere, and made into hosiery in his own works. In 1850 he acquired Stonefield Mill and the Waulk Mill. The latter, understood to be the oldest building of the kind in the place, he pulled down, and placed a large spinning mill on its site; and since that time all the processes in converting the raw material into hosiery have been conducted by the firm. Like other mill-owners in town, he began the manufacture of piece goods; but the hosiery department always received most attention from him. He preferred it to the other, he used to say, because, "though it was not so profitable, it gave most employment in proportion to the capital invested"—a reason which certainly did honour to his heart.

The first proprietor of carding-engines in the town was Mr William Wilson, father of the late Chancellor of India, of the Ex-Provost of the burgh, and of two other sons who are now at the head of extensive manufacturing firms. Mr Wilson commenced business as a hosier in 1788, and nine years afterwards acquired a lease of part of the Ince Company's property, where he conducted carding and spinning. In 1806 Mr Wilson entered into partnership with Mr William Watson, and the firm considerably extended their mill property. The partnership was dissolved in 1819 and the property divided. Mr Wilson assumed his sons as partners, and the new firm, William Wilson & Sons, was dissolved in 1851, the three sons of the original head continuing in business on their own account. The eldest, Mr Walter Wilson, built a large mill, in which he conducts both the hosiery and tweed trades. The second, Mr John Wilson, who obtained part of the property of the firm, and has since built extensive additions, also conducts both branches. Provost Wilson, the youngest son, who obtained the remainder of the firm's property, is with his partner, Mr Armstrong, engaged in the tweed trade only. The original mill property belonging to Messrs Wilson & Armstrong has been greatly enlarged of late years. Messrs William Wilson & Sons were the first to employ steam-power at their works. Mr Watson also assumed his sons as partners at his separation from Mr Wilson, and the firm of William Watson & Sons is now represented by his grandsons, who lately relinquished the hosiery branch, and devote their entire attention to tweeds. Their property has been largely added to.

The original partners of the firm of Dicksons & Laings, whose works at Wilton Mills are well known to all acquainted with the

Hawick trade, were also among the pioneers of the manufacturing prosperity of the burgh. The Brothers Laing carried on business as hosiers, spinning their yarns on the hand-jenny, before becoming mill proprietors. They entered into partnership with Messrs Dickson, and the first part of Wilton Mills was built in 1809-10. On two occasions the factory was enlarged. The parent building was burned down in December 1867, being then the centre of an extensive range of erections which the increasing business of the firm had called into existence. On the site of the old mill new buildings have been erected. It was at the Wilton Mills that the first spinning-jennies in Hawick driven by water-power were worked, and at the same place that the power-loom made a first appearance in 1830. There are other two thriving businesses, offshoots of the Wilton Mills establishment—that of Mr John Laing, hosiery manufacturer, whose works are particularly mentioned in the account of that trade; and that of Messrs Laing & Irvine, manufacturers and merchants, whose head-quarters are in Hawick, and their mill property at Peebles.

The youngest, but by no means the least important, of the leading Hawick manufactories, is that of Messrs William Laidlaw & Sons. The late founder of this firm conducted a small but thriving hosiery trade for a number of years before he built his mill in 1834, and as the tweed trade assumed importance, he, like the majority of his brother-manufacturers, combined that branch with the making of stockings. Both branches were successfully carried on by himself and his sons, until a few years ago one of the latter, now sole partner of the firm, discontinued the hosiery department, and made great improvements and additions to his premises, which were thenceforth exclusively devoted to the tweed manufacture. Mr Laidlaw subsequently purchased Lynnwood Spinning Mill from Messrs John Nixon & Sons, where hosiery yarns are still made, so that he is again indirectly connected with the original trade of his firm. His mill property at Teviot Crescent and Lynnwood is among the largest in the woollen trade in Scotland, and certainly the most extensive owned and managed by a single proprietor.

The first kind of woollen cloth made for the market in Hawick was a coarse blue, which was sent to Leeds to be finished. Duffle for petticoats, plaidings, blankets, and flannels were also manufactured during the first three decades of the century; and in 1826 Messrs William Wilson & Sons first used foreign wool in the manufacture of fine flannels.

The number of sets of machines in Hawick is 68. The carding-

engines are almost all 60 inches wide. There are 52,864 spinning-spindles, of which 12,564 are self-acting, including spinning-frames; 5894 twining-spindles, half of which are self-acting. There are 270 power and from 100 to 150 hand looms. The weight of wool carded in the sixty-eight sets of machines is 1,801,796 lb annually, assuming that the mills work only during the day; but as in busy times the majority of the factories run all night, the quantity is in such seasons much greater. The extent of the hosiery trade has already been stated.

SELKIRK.—The number of manufacturing establishments in Selkirk is seven—two spinning, and five tweed. The tweed firms are Messrs J. & H. Brown & Co., Ettrick Mills; Messrs Waddel & Turnbull, Dunsdale Mill; Messrs George Roberts & Co., Forest Mill; Messrs Dobie and Richardson, Bridgehaugh Mill; and Messrs James Bathgate & Sons—the latter, however, having no carding and spinning machinery. Philiphaugh and Yarrow Mills are carding and spinning establishments only, the former containing four sets of carding machines. Yarrow Mill, which belongs to Messrs Brydone and Brown, was started about the beginning of 1868, with four sets of condensers, self-acting mules, and scouring, burring, teasing, and drying machinery of the newest construction. The three first-mentioned firms have seen the beginning of the tweed trade, properly so called, and have all done much towards bringing it up to the important position it now occupies as a branch of national industry. Messrs Waddel & Turnbull, who had previously rented their premises, became proprietors in 1863, and have since greatly enlarged and improved them. The firm have, in addition to their reputation as general tweed-makers, a well-established name as first-rate producers of heavily milled tartans. Messrs Roberts have the reputation of using superior wools, which of course gives a character to their goods. Messrs J. & H. Brown & Co. turn out, perhaps, more Scotch tweeds than any other firm in the trade. They were the first in Selkirk to introduce, about four years since, the new and improved condensers, a step in which they were closely followed by other firms, till now there are only one “piecing-machine” and two “roving cards,” or “perpetuals,” in the place. Messrs Roberts were the first to introduce the self-acting mule, an example also largely imitated. A great many other machines for saving labour, or improving processes, have been introduced lately, and large additions made to premises. To a water power of sixty horse, Messrs J. & H. Brown & Co. have recently, by the introduction of a pair of 40-horse power condensing

engines, provided a motive force which, in case of necessity, can be raised to 400 horse power. These alterations and additions have also necessitated, on the part of Messrs Roberts and Messrs Waddell & Turnbull, the application of steam power, both having erected powerful engines within the last two years, their water supply having become quite inadequate to the demands made upon it. Except in the case of Philiphaugh Mill, which is driven by water alone, the motive power of the more recently started mills is wholly steam. The following statistics of machines and persons employed in Selkirk have been drawn up with care, and may be relied upon:—Carding-machines, 32 sets; spindles in self-acting mules, 15,612; do. in hand-mules, 12,260; do. in throstles for twisting, 1726; number of power-looms, 181; do. hand-looms, 97; persons employed, 1032. The number of workers appears large compared with the number of machines, but that is explained by the fact, that Messrs Roberts & Co. have a mill at Innerleithen for spinning yarn which is worked up into tweeds at Selkirk; and that Messrs J. & H. Brown & Co. buy all the yarn required for one class of goods, which forms about one-third of their entire production. The weight of wool used will be something like 860,000 or 870,000 lb per annum, costing, at present rates, about L.86,000 or L.87,000; and wages paid, between L.28,000 and L.29,000 per annum. The total overturn may be set down at L.220,000.

INNERLEITHEN.—The manufacture of woollen cloth was introduced into Innerleithen in 1790, when a mill was built, at an expense of L.3000, by Mr Alexander Brodie, who was a native of the neighbouring parish of Traquair, and who, having made a fortune as a smith in London, wished to benefit his native district by increasing the field for labour. The project did not succeed to the wishes and expectations of the philanthropic originator, and for many years little progress was made. It was not till between 1830 and 1840 that the woollen manufacture began to take root. The rate of advance may perhaps be best shown by giving the increase in the population of the parish, the whole of which increase is due to manufacturing—the rural part, if it has not decreased, remaining stationary. In 1801 the population of the parish was 609; in 1841, 937; in 1851, 1236; in 1861, 1823; and at present it is computed at between 2400 and 2500. Brodie's Mill, which is now in the possession of Messrs Walker, Gill, & Co., has been much extended; and including two at Walkerburn, which is about one and a half mile distant from Innerleithen, six other mills have been added

within the last twenty-five years. At first water was the only motive power; but from the extent to which hill drainage has been carried on, the supply of water in summer is now very precarious, and to all the factories except two, steam-power has been added. All the mills—except that of Messrs Wilson, who manufacture blankets and plaiding only, and those of Messrs J. & A. Dobson, and Dobson Brothers, who produce a quantity of woollen shirting—are solely engaged in making tweeds. The following statistics relate to the seven factories of the Innerleithen district:—Sets of machines, 29; number of hand and power looms, 264; spindles, 18,708; workpeople, 700; quantity of wool used, 959,604 lb per annum; value of goods produced L.210,900 per annum; wages paid L.24,200 per annum. The rise of the manufacturing village of Walkerburn has been very remarkable. Fifteen years ago it had no existence, and now it has a population of upwards of 700, and contains the largest factory on the banks of the Tweed, viz., that of Messrs H. Ballantyne & Sons, the first part of which was erected in 1855. This mill now contains 10 sets of carding-machines, 80 power and hand looms, 7260 spindles, employs 270 workers, and the quantity of wool annually used in it is 450,000 lb. In the same village there is another large factory, which belongs to Messrs James Dalziel & Co. As it was erected within the last three years in place of another, which was burned down, the machinery is all of the newest and most approved kind. It gives employment to about 130 persons.

JEDBURGH.—So early as the year 1728 a woollen factory existed in Jedburgh, and it is believed to have been the first in that district. It was erected by the magistrates under the patronage of the Trustees for the Improvement of Manufactures and Fisheries. The mill soon passed into the hands of a joint-stock company, which received a charter from the magistrates, giving them powers—“1st, To import and export the several subjects of their manufactories without trouble or molestation. 2d, Forasmuch as, by His Majesty’s letters patent, it is appointed that L.700 sterling should be annually employed in carrying on woollen manufactures within the several shires which produced tarred wool, whereof the shire of Roxburgh was one, and that the trustees named in the said patent had selected Jedburgh as one of the stations, they enacted and agreed that the company should have full liberty and allowance to apply to the trustees who had the distribution of the said L.700, to the end that they might receive such a share thereof as might be by them allotted for carry-



ing on the woollen manufactory at Jedburgh. 3d, Power to make bye-laws consistent with the public law of the realm and Acts of Council." This company did not succeed. In 1745 a merchant in the burgh named Robert Boswell, took a lease of the mill, at an annual rent of L.7; and so anxious were the magistrates to encourage him, that no dyed or waulked cloth was allowed to be hung on the Canongate Bridge, unless it was waulked or scoured by Boswell. The first manufacturers who were successful in carrying on anything like an extensive trade were Messrs J. Hilson & Sons, into whose hands the mill passed in 1786. Strong woollen cloth, blankets, and plaiding were manufactured to a considerable extent, and afterwards a large quantity of tartan cloth was made by the same firm, who also began the manufacture of carpets, a branch which was given up many years ago. Although Jedburgh was one of the first towns in Scotland in which the woollen manufacture was carried on, it has long since been eclipsed by the neighbouring towns of Hawick and Galashiels. Within the last two years considerable additions have been made to its manufacturing power. There are five factories, having in all eleven sets of machines. Rather more than 200 persons are employed, and the value of the annual produce may be set down at something like L.66,000. Tweeds are the principal goods produced.

DUMFRIES.—The hosiery trade of Dumfries is believed to have originated about eighty years ago, but up till about 1810 it was carried on upon a small scale. Messrs Haining, Hogg, & Dickson are believed to have introduced the business. In 1810 the late Mr Robert Scott (who may be called the founder of the woollen trade of Dumfries) entered into partnership with Mr W. Dinwiddie, and to the first-mentioned gentleman is due the credit of having concentrated the hosiery trade in the town, taking it out of the hands of the smaller makers, and opening up an extensive and profitable connection with the London and other English markets. From that time the trade took a great start, and in making hosiery Dumfries soon rivalled, if it did not surpass, Hawick. About forty years ago the stocking-making of Dumfries gradually developed into the manufacture of woollen underclothing of all kinds. In 1832 so many as 300 persons were known to be employed in Dumfries and the neighbouring villages in that branch of business; and 400 dozen stockings, socks, drawers, and shirts were made weekly. From that time till now the trade in all its branches has been prosecuted with, on the whole, remarkable success. The leading firms in Dumfries

are Messrs R. Scott & Sons; Messrs Milligan & Co.; Messrs James Dinwiddie & Company, Greenbrae; Mr William Halliday, Maxwelltown; Mr Robert Macgeorge, Maxwelltown. Mr Paterson carried on the hosiery business on a considerable scale at Lochfoot, and there are one or two independent makers in a small way in some of the neighbouring villages. There are fully 500 frames or stocking-looms in Dumfries and the district, of which at present about 300 will be in full work, giving employment to at least 500 persons, including weavers, winders, seamers, trimmers, finishers, and warehousemen. The consumption of hosiery yarns by the whole trade of the district is estimated at 120,000 lb per annum, in addition to a large quantity of tweed yarns. The yarns are obtained chiefly from Hawick, Peebles, Alloa, and Kinross. The capital invested in the trade is about L.40,000, and the annual turnover is, as nearly as possible, represented by the capital. Nearly all the work is paid for by the piece or dozen, a different scale applying to every gauge. Hence, it is difficult to estimate the average weekly earnings; but on the narrow frames they will range from 10s. to 13s.; on the broad frames, from 15s. to 18s.; and on the improved frames, from 20s. to 25s. Altogether, the wages paid in connection with the hosiery trade in Dumfries and district exceed L.11,000 a-year. In addition to plain hosiery, there is a considerable manufacture of what are known as fancy goods, including tweed hose, knickerbocker hose, shooting socks, &c., besides a variety of articles in which bright colours tastefully arranged are employed. Messrs Milligan & Co. are the only firm in Dumfries who employ power-looms for the manufacture of the hosiery fabric. Steam-power is used in nearly all the mills for the finishing processes.

The tweed trade of Dumfries dates from the year 1846. Two years previously Messrs Robert Scott & Sons purchased premises at Kingholm, about a mile below Dumfries, for the purpose of spinning hosiery yarns, and afterwards turned their attention to the manufacture of tweeds, which they were soon engaged in making in considerable quantities for the London and Glasgow markets. In 1853 the trade greatly improved, and a much larger quantity of goods was manufactured. Prior to that date the senior partner of the firm (the late Mr Robert Scott already referred to) had retired from the business, which was carried on till 1856 by his sons, Messrs Robert and J. L. Scott. In that year the partnership was dissolved, and Mr J. L. Scott carried on the business at Kingholm, while Mr Robert Scott, who had entered into partnership with his brother, Mr Walter Scott, of Manchester, commenced the manufacture of

tweeds in a large and handsome mill erected on ground overlooking the Dumfries Dock Park, and called the Nithsdale Mills. In 1866 the partnership between Messrs Robert and Walter Scott terminated, the Nithsdale Mills becoming the property of the former, who let them on lease to his nephew, Mr Robert Scott, jun., and his partner, Mr Nixon, of London. In 1866 Mr Walter Scott erected an extensive factory on the Stewartry side of the Nith, which is known as the Troqueer Mill. Upwards of 300 hands are employed in it. In 1865 the Kingholm Mills were purchased by a limited liability company, under the designation of J. Lindsay Scott & Co., with a capital of L.80,000. A new factory was recently completed for the manufacture of tweeds by Mr J. M'Ewen Henderson, and is known as St Michael's Mill. There are also tweed factories at Newabbey (Mr Robert Laing); at Cample, near Thornhill (Messrs Arrol & Peace); and at Sandbed, near Lockerbie. Mr Thomas Shortridge, Dumfries, does a large business in finishing for country makers.

The number of sets of carding-machines employed by the three principal firms in or near Dumfries is about thirty. The quantity of wool spun by them is about 800,000 lb per annum, and a large quantity of yarns is brought from other towns. The capital invested in the whole tweed trade of the town and district is about L.260,000, which may also represent the annual turnover. About 200 power-looms and 100 hand-looms are in use. The number of persons employed in the tweed manufactures of Dumfries and neighbourhood is upwards of 1000. To the ingenuity and shrewdness of a pattern designer at Kingholm Mills—Mr John M'Keachie—a great deal of the early success of the trade is due. Mr M'Keachie was originally a damask weaver, and secured an engagement at Kingholm when the tweed trade was begun there.

LANGHOLM.—Previous to 1832 the manufacturers of Langholm were extensively employed in the cotton trade. The work was supplied by firms in Glasgow and Carlisle, who had agents in Langholm. Mr David Reid (the father of Mr Reid of Messrs Reid & Taylor) and Mr Andrew Byers (the father of the present partners of Messrs Andrew Byers & Son) were the originators of the woollen trade of Langholm. They began the trade by making shepherds' plaids or "mauds," and "shepherd check" trousers, which they disposed of in the towns within a circuit of thirty or forty miles. They always made their journeys on foot. This branch of trade was limited at the commencement—one or two hand-loom weavers being sufficient to supply the demand. Lang-

holm is now justly celebrated for the beauty and finish of its "shepherd checks." Messrs T. & A. Renwick had the Langholm Mills for many years, and supplied yarns for the tweed manufacturers. Mr Alexander Renwick, the last surviving member of the firm, was an enterprising and active man of business, and gave a great stimulus to the trade of the town. He had Whitshiels as well as Langholm Mills. At his death in 1851 the latter passed into the hands of Messrs Reid & Taylor, who were the first to begin the tweed trade on a large scale in Langholm. From comparatively small premises, they have now, by almost yearly extensions, one of the most extensive and perfect tweed manufactories in the trade. Messrs James Bowman & Son began tweed manufacturing a little later than Mr Reid and Mr Byers, and by like energetic spirit and good taste, they also have converted a comparatively small business into an extensive one. Mr Byers, senior, built the mill in Buccleuch Square. His sons succeeded him, and added to their business the spinning of yarn, by acquiring Whitshiels Mill. The trade of Langholm cannot be correctly estimated by the number of machines for spinning yarn, as the manufacturers purchase at least as much from other towns as is spun in Langholm. There are seventeen sets of carding-machines, and the yarn procured from other towns for the trade will employ at least other seventeen sets. The quantity of wool used is about 530,000 lb annually, and the yarn bought from other towns will represent a similar quantity of wool. The amount of money turned over annually in the tweed trade in Langholm is estimated at over L.200,000. The capital employed is about L.130,000.

AYR.—The principal woollen manufactory in Ayrshire is that of Mr James Templeton, situated in Fort Street, Ayr. This mill, from a very small beginning, has grown to be one of the largest in Scotland of its kind. About the beginning of the present century it was a small cotton-mill carried on by a company. A few years afterwards it fell into the hands of the late Dr Charles (who was for some time Provost of Ayr), who turned it into a woollen mill. It was managed by the late Mr James Templeton, and the principal work carried on in it then was the carding and spinning of wool for the country people of the district. About the year 1821 Mr Templeton bought the premises, which he afterwards greatly extended; and in 1832 began the manufacture of carpets. At that time, in addition to the numerous persons engaged in the different processes of preparing the wool, about sixty carpet weavers were

employed. At Mr Templeton's death in 1844, his nephew, Mr James Templeton, the present proprietor, came into possession of the mill, and since that time the works have been gradually extending, till they are now more than twice as large as they were then. The buildings cover a large space of ground, and the machinery, which is of the newest and best construction that could be obtained, is also very extensive. Only two kinds of carpets are produced at the works—superfine and three-ply Scotch. Of these immense quantities are annually turned out, which are readily disposed of in the home market. Besides producing all the yarns for his own manufacture, Mr Templeton does a large trade in carding and spinning yarns for the manufacture of Brussels carpets, which he disposes of to the manufacturers of Kidderminster, Glasgow, and other places. He employs nearly 500 persons. Of these 150 are carpet-weavers, whose average earnings will be about 20s. a-week. This is the only public work in the burgh of Ayr in which a large number of hands are employed. In Mr Reid's manufactory, situated in Russel Street, built seven or eight years ago, from thirty to forty persons are employed in weaving winceys and flannels for Glasgow houses. There are a few other woollen manufactories in Ayr, but on a smaller scale. Messrs Jamieson, whose factory is in Lymond's Wynd, do a considerable trade in making blankets, flannels, plaidings, and various kinds of woollen wearing apparel. A few miles from Ayr, in the parish of Dalrymple, there is also a woollen mill of considerable extent—viz., Skeldon Mill, in the possession of Mr Hammond. About sixty persons are employed there in the manufacture of blankets, plaidings, &c.

KILMARNOCK.—Carpet-weaving is the principal and oldest manufacture in Kilmarnock. The first firm engaged in it began in 1777; and the value of the manufacture in 1791 was estimated at L.21,000. After that date the trade took rapid strides; and between 1820 and 1827, a dozen firms were engaged in it. The value of the carpets manufactured in 1837 was L.150,000. Previous to 1848 the number of firms had dwindled down to five (the present number), and the annual value of the produce has since been about L.100,000. Steam-power was first introduced into the works of Messrs Gregory, Thompson, & Co., for the manufacture of Brussels carpets in 1857. This firm are the most extensive manufacturers of Brussels carpets in Scotland. The other firms confine themselves to Scotch carpets. The average wages of the men engaged in the carpet factories range from 15s. to 18s. a-week.

Bonnet-making is next in importance of the woollen manufactures of Kilmarnock. There are six firms engaged in that trade, and the annual value of the goods made is estimated at L.55,000. One firm—that of Messrs Douglas, Reyburn, & Co.—sent out goods in 1867 to the value of L.37,000. By the various firms there are employed 1100 women and girls as knitters, 300 as liners, and 90 men and boys as finishers. In Kilmaurs, two miles off, there are employed 100 knitters, 50 liners, and 20 finishers, and the annual value of the goods made is L.1500. In Stewarton, five miles off, there are employed 1800 knitters, 500 liners, and 200 finishers, and the annual value of goods made is L.90,000. In the three places about L.48,000 is annually paid in wages.

The five carpet firms have spinning-mills of their own (three of them in Kilmarnock, and two in neighbouring villages), and spin entirely for their own looms. Besides, there are in town two other small mills—one for supplying the carpet works chiefly, and the other for the supply of tweed manufacturers. In the latter there are twenty-two men employed, and five sets of carding-machines. In each of the other works there are four sets of carding-machines. A more extensive spinning-mill is situated at Crookedholm, two miles off. Crookedholm Mill employs about sixty men, women, and girls, whose wages are about L.1200 a-year. Their labour produces 187,200 lb of worsted annually, the value of which is about L.15,000. The machinery is driven by steam.

Tweeds and blankets are manufactured in Kilmarnock to a small extent only. There is no large factory devoted to these branches; only two or three dozens of weavers scattered and unconnected. One or two of the calico-printing firms, on account of the depression of their own trade, have begun in a small way to manufacture blankets and tweeds.

Plaids and shawls, tartans, and other woollen goods, are manufactured to some extent by one firm, whose principal trade, however, is in fine winceys. At present thirty-two looms are in operation, and the value of the annual production is between L.6000 and L.10,000. There is, besides, an extensive wincey manufactory, which sends out goods annually to the value of not less than L.100,000. 500 looms are in operation in the factory, and about L.9000 a-year is paid in wages.

There is a large wool-combing and spinning factory at Dalry, Ayrshire. It belongs to Messrs Thomas Biggart and Co., and contains 36 carding-engines, which employ from 300 to 400 persons. About 2,000,000 lb of wool are used annually.

PAISLEY.—The manufacture of woollen goods was introduced into Paisley about thirty years ago. The trade consisted of clan and fancy checks made into long and square shawls, and piece goods for dresses. It has continued to increase steadily. Scarfs and shirting cloth have also come to form an important part of the woollen manufactures of the town. The Crimean war gave a great impetus to the shirting manufacture, and since then it has been an important branch of local trade. Almost all the harness-shawl houses in Paisley are now engaged in the manufacture of woollen fabrics. Since the falling off in the harness trade, manufacturers have gone more and more into the making of woollen goods. Attempts have been made by one or two Paisley houses to introduce the manufacture of tweeds, but without success. The woollen trade is confined to the branches above enumerated, with the exception of winceys and some other kinds of mixed fabrics. The woollen manufacture is chiefly conducted by hand-loom. It is computed that from 800 to 1000 hand-loom weavers are employed on woollen fabrics in Paisley. The various houses also employ weavers in other districts. Kilbarchan contains about 800 hand-loom weavers, who are entirely employed on woollen fabrics for Paisley manufacturers. About 100 weavers more are similarly employed in adjacent villages—making a total of nearly 2000 employed by Paisley houses in the weaving of woollen fabrics during the busy seasons. The wages of the operatives are low, and have somewhat declined of late years. They average from 8s. to 9s. a-week.

STIRLING AND NEIGHBOURHOOD.—In Stirling two woollen manufactures are in operation. The most extensive is Forthvale Mill, belonging to Messrs John Todd & Sons. The principal branch of the woollen trade for which these works are used is spinning yarns for the manufacture of tweeds, shawls, and fancy stuffs. There are six sets of carding-machines and 6284 spindles employed in the spinning department. The machinery is propelled by an engine of fifty horse power. The quantity of wool (all foreign) used annually is 376,000 lb, and the value of the annual production is L.30,000. There are sixty-five persons employed.

The Parkvale and Hayford Mills, situated near the village of Cambusbarron, about two miles from Stirling, belong to Messrs Robert Smith & Son, and comprise dyeing, spinning, and weaving by power. The goods manufactured are a superior quality of winceys and other materials for ladies' dresses. Wincey has been

brought to the greatest perfection by Messrs Smith. The warps are composed of cotton yarn, which is chiefly spun in Lancashire; the wefts are of wool, the produce of the spinning department of the works. In the weaving factory there are 530 power-looms, and in the spinning department 13 sets of carding-engines. The whole machinery is driven by six steam-engines of 300 horse power in the aggregate. The wools manufactured are English, German, and colonial, and the quantity used annually is 610,000 lb. The goods made amount in value to from L.170,000 to L.200,000 per annum, according to the price of raw material. There are in all 950 persons employed. The wages paid annually amount to L.19,000.

At Bannockburn there are two extensive works—one owned by Messrs Wm. Wilson & Sons, the other by Messrs J. & W. Wilson. That of Wm. Wilson & Sons embraces spinning, dyeing, and the weaving of carpets, tweeds, and tartans. Fourteen carding-machines are employed. The quantity of wool used annually, including 50,000 lb purchased from other spinners, is 680,000 lb. The value of the annual production is L.80,000; and the number of persons employed is from 500 to 600. Messrs J. & W. Wilson manufacture carpets only. The wool used annually is 500,000 lb, and the value of their annual production is about L.25,000. They employ 180 hands, including weavers, dyers, and wool-sorters. There are, besides, two small manufactories, in which about 50 persons are employed in weaving tartans and kiltings. The value of their annual production is about L.45,000.

ALLOA.—At Alloa there are four wool-spinning factories, and an extensive business is carried on. At Kilncraigs Manufactory, which belongs to Messrs John Paton, Son, & Co., seventeen sets of carding-engines are in use, and 300 persons are employed. The work done comprises the spinning of knitting, hosiery, and tweed yarns. The yarns known throughout Scotland as "Alloa yarns" are also manufactured at this establishment. At Springfield Mill, belonging to Messrs Thomson Brothers, the work is of a finer description than that done at Kilncraigs, the yarns produced being for making fine shawls, winceys, and tweeds; and there are about 220 persons employed. At Gaberston Mill, belonging to Messrs F. Lambert & Co., both spinning and weaving are carried on. There are five sets of carding-engines, and about 300 persons are employed. The articles manufactured are woollen shawls and shirtings. There are two other spinning-mills in Alloa—the Keiler's Brae New



Mill, belonging to Messrs John Paton, Son, & Co., and Lambert & Co., at which a good business is done in making hosiery and shawl yarns. Seven sets of carding-engines, and nearly sixty persons, are employed. Keiler's Brae Old Mill is occupied by Mr Henderson, and contains two sets of carding-engines. The quantity of wool used in the spinning-mills is about 3,458,000 lb, and the value of the produce is nearly L.230,000 annually.

TILlicOUNTRY.—In 1755 the population of Tillicoultry was 787; in 1793, it was 909. During that period the woollen trade was in an almost lifeless state; but a reaction soon followed, and in the succeeding thirty-eight years the population was increased by 563. In twenty years more the census showed an addition of 3210; and in 1861 the population was 5054—giving a total increase of 4145 over that of the year 1793. In point of antiquity, the Tillicoultry woollen trade ranks among the first, if it was not the first, in Scotland. Mention is made of its woollen goods in the Cartularies of Cambuskenneth so early as the reign of Mary Queen of Scots. At that period, and for about two centuries afterwards, Tillicoultry was famous for weaving a coarse woollen cloth called “serge,” which is described as a species of shalloon, having a worsted warp and woollen weft. It sold at about 1s. a-yard, and was long known in the Lawnmarket of Edinburgh as “Tillicoultry serge”—indeed, that name appears ultimately to have been applied to all serges made in the district. Towards the end of the eighteenth century the current of manufacturing enterprise in Tillicoultry seems to have become stagnant, and the making of serges was transferred to Alva; though it would appear from the old “Statistical Account” that a market for Alva goods was not easily obtained, it being a common saying that “a serge web from Alva would not sell in the market while one from Tillicoultry remained unsold.” Notwithstanding such preference, Alva ultimately carried the trade in that class of goods. In 1792–5 the woollen trade of Tillicoultry appears to have been at its lowest ebb. There were then but twenty-one weavers in the parish; and the stamp-master (who kept no note of the goods) supposed that 7000 ells of serge, and an equal quantity of plaiding, would cover the produce that passed through his hands annually from Tillicoultry. The manufacture of muslins was introduced about that time, but apparently met with small success. In 1798 or 1800 John Christie, “an ingenious and energetic native of the village,” erected the first woollen factory in Tillicoultry. At a later period he introduced

carding-machines with improvements of his own. In 1817 the present firm of Messrs R. Archibald & Sons began business, and soon other woollen factories were erected. The trade at the time was almost solely confined to the production of blankets and plaidings. It is worthy of note that the first "self-acting mule-jenny" and "slubbing billy" made in the kingdom were purchased from the inventor and maker, Mr Smith, of Deanston, by Messrs R. Archibald & Sons, in 1839. The machines are still in the possession of the firm, and in operation.

In these days, when strikes and intimidation are common, it may be interesting to narrate an incident which happened in Tillicoultry in the transition period of its manufactures. When spinning machinery was first introduced to do the work which the wives of the village had formerly done with their "muckle wheels," Mr William Archibald (who possessed the mill now occupied by Messrs Wm. Gibson & Co.) endeavoured to introduce water as a driving power; and for that purpose erected a dam on the Mill Glen Burn to divert the water to his mill. The wives considered that such a scheme was neither more nor less than "a new way of playing off an old-fashioned trick—taking the bread out of their mouths by taking the work out of their hands;" and a council of matrons was convened. What transpired at the meeting is not reported; but the result was that they mustered in a body, and, armed with spades, hoes, pick-axes, pokers, and tongs, proceeded, "without let or hindrance," to the mill-dam, which they speedily demolished.

About 1824 the manufacture of tartans was introduced into Tillicoultry, and such were the enterprise, energy, and taste brought to bear upon it, and the success by which it was attended, that general prosperity prevailed, and that to such an extent as to add in twenty years over 3000 to the population. The tartan trade has undergone a considerable change since then—"clan" patterns, which for many years were paramount, being now almost entirely discarded for "fancy" patterns. Messrs Paton, of Tillicoultry, have long held a high place in the market for these goods; and their manufactures in tartan have decorated the person of Her Majesty the Queen, and serve as hangings in the Royal Palace at Balmoral. The woollen productions of Messrs Paton are of a varied description, and consist of shawls, tartans for dress, and cloakings of various kinds. The firm employ from 900 to 1000 operatives, and pay annually in wages about L.20,000. They have sixteen sets of carding-engines in opera-

tion, each of which puts through wool to the value of about L.2600—the goods when finished representing about three times that amount. Both water and steam are used to drive the machinery—the former of twenty-five, and the latter of seventy-five nominal horse power.

Messrs R. Archibald & Sons carry on an extensive business in shirtings, shawl goods, tartans, and thin tweeds; and Messrs J. & R. Archibald, Devondale, have long been famous for the excellence of their Scotch tweeds.

In the parish there are twelve woollen factories, containing forty-six sets of carding-machines, and employing upwards of 2000 persons. Besides these, there are nine establishments where hand-loom weaving is carried on, containing in all about 180 looms, and employing nearly an equal number of weavers, whose chief productions are shawls and napkins. In connection with the factories there are 340 hand-looms, and about 230 power-looms. Australian and Cape wools are those principally used in Tillicoultry; neither that grown on the Ochils nor on the Cheviots being suitable for the class of goods manufactured.

The sanitary condition of the factory operatives is highly satisfactory; and the healthy character of the woollen trade is now generally admitted by the Factory Inspectors, as well as by the medical profession. Dr Thomson, late of Tillicoultry, and now of the General Prison, Perth, was the first to write upon the subject, in 1840; and concurrent testimony seems to have emanated from Hawick, Galashiels, and elsewhere, from professional observers, and led Sir James (then Dr) Simpson to institute an investigation. A number of valuable experiments were made by Sir James through Dr Thomson and others, which resulted in demonstrating that the vocation of the operatives in woollen manufactories is a healthy one.

ALVA.—The inhabitants of Alva are almost entirely dependent on the woollen manufactures. The population was 1150 in 1821; 2216 in 1841; and 3282 in 1861; and the trade of the place has increased at a like rate. Blankets and serges were the only goods produced up till 1829, when the manufacture of shawls was introduced. There are nine spinning-mills in the village, employed on yarns for making shawls, tartan dress goods, tweeds, &c. The mills contain thirty-seven sets of carding-engines, driven by steam and water power. The number of persons employed is about 220. The amount of raw material put through in the course of a year is valued at about L.123,000. Some of the yarn is used in the place, but the greater part of it goes to agents in Glasgow.

The weaving of shawls, handkerchiefs, plaids, and shirtings is the staple trade of the village, and gives employment to about 693 journeymen and 99 apprentices in the busy season, besides from 500 to 600 women who do the winding, twisting, and finishing. A number of young boys are also employed as drawers and twisters. Since shawls and tartans ceased to be fashionable articles of female attire, and since the closing of the ports of the United States to our manufactured goods, trade has been limited to a few months of the year; and that circumstance presses hard on those employed in the weaving business, who generally seek work during the winter months in Hawick, Selkirk, Galashiels, &c.

The value of the manufactured goods runs from about L.200,000 to L.250,000 annually. The chief market is Glasgow, but a considerable quantity also goes to Manchester, London, and some of the principal Irish towns.

At Menstrie—a small village two miles distant from Alva—there is a large factory known as Elmbank Mill, owned by Messrs Drummond & Johnstone. It contains eight sets of carding-engines, driven by a steam-engine of ninety horse-power. The machinery is of the most recent construction. The raw material used annually is valued at about L.33,000, and the goods manufactured at double that amount.

KINROSS.—This town has changed its staple trade several times. The manufacture of linen attained some importance in the middle of last century, and in 1790 employed nearly 200 looms, while the value of the produce was about L.5000 annually. Sixty years ago, cotton weaving was introduced and flourished for a time, until machinery driven by steam or water power was set up and superseded the labour of the hand-loom weaver. Previous to the introduction of these manufactures, Kinross was famous for its cutlery; but that trade is now extinct. It is upwards of thirty years since the manufacture of woollen goods was begun in the locality. From about the year 1836 up till 1845, weaving was plentifully supplied from Tillicoultry and by local manufacturers. In 1846 a wool-spinning mill was erected at the south end of the town for spinning yarn for the manufacture of shawls, &c.; and, by dint of good management, it has been kept in active operation. Another mill, at Bellfield, had been started several years previously, and is still at work. About that time, too, the greatest activity prevailed in the manufacture of shawls and plaids, which branch was carried on till 1848, when it received a material check. A

gradual decline then set in, and now all the factories, as such, have ceased to exist, the largest having been recently converted into a printing-office. As a consequence of these changes, woollen weavers have had very irregular employment; and most of the original manufacturers, from various causes, do comparatively little in the manufacture of woollen goods. In the spinning of woollen yarns, again, the case is different, for not only have the two mills referred to been regularly employed, but another large mill (under the Limited Liability Act) has been recently erected opposite the old one on the South Queich; and a fourth, superior to all the others in size, was erected in Milnathort the other year.

ABERDEEN.—Machinery was first introduced into the woollen manufactures in Aberdeen about 1789 by Mr Charles Baird, silk dyer, who brought from England two carding-engines and four spinning-jennies. He erected a mill at Stoneywood, a few miles from Aberdeen. Previous to that time the carding and spinning of wool were performed by hand. During the eighteenth century an extensive trade was done in the manufacture of stockings for the home and foreign markets—that being, in fact, the staple trade of the city. In 1703 a company was formed for the purpose of carrying on the trade on an enlarged scale, and during the greater part of the century stocking-making was prosecuted most successfully—most of those engaged in it retiring upon competent fortunes. Perhaps the best known, because the oldest, house in the woollen trade in Aberdeen is that of Messrs Alexander Hadden & Sons, Green. Established about the year 1748, this firm have long held a foremost place in the trade. Their works are situated in the centre of the city, and are of considerable extent. The mills at Garlogie and Don also belong to them. They consume about 2,000,000 lb of wool annually, and give employment to upwards of 1400 hands. The tweed trade is principally in the hands of Messrs J. & J. Crombie, Grandholm Mills, and Messrs Hadden. The manufacture of tweeds is now carried on extensively. Messrs Crombie have long been engaged in the tweed business, and their works at Grandholm are well known. They give employment to nearly 600 persons. The value of the tweeds manufactured in and around Aberdeen is upwards of L.120,000 annually. Messrs Hadden are the largest manufacturers of carpets in Aberdeen. The trade has been a growing one, and now the annual value of the productions is about L.50,000. The manufacture of wincey, for which the city is widely known, is in the hands of seven or eight firms, some of

which do a large business in the home and foreign markets. The annual value of the wincey goods produced is at least L.250,000. The hosiery trade is rather on the decline in Aberdeenshire, and has been so for some years. The value of the hosiery made annually is over L.20,000. The manufacture of shawls is but in its infancy in Aberdeen, and does not call for more particular notice. There are at least 230 power and 600 hand looms at work in the woollen trade. It is estimated that upwards of 3000 persons find employment by this industry, and that upwards of 3,000,000 yards of tweeds, winceys, &c., are produced annually.

INVERNESS AND NEIGHBOURHOOD.—There are three woollen manufactories near Inverness. They are situated at Holm, Avoch (in Ross-shire), and Culcabock. The first-named—carried on by Messrs Nicol & Co.—has been in existence for seventy years, and is the oldest in the north. The goods produced are tweeds, mauds, plaiding, and blanketing, the greater part of which is made from wools grown in the northern counties. A considerable quantity of colonial wool is also used in the manufacture of tweeds. The number of operatives employed at Holm Mills is 100; at Avoch, from 50 to 60; and at Culcabock (formerly a meal mill, and recently converted into a woollen factory), 15. At Holm both water and steam power are used. There are three sets of carding-engines, and spinning and twisting machines. At Avoch two sets of carding-engines are in operation. At Culcabock there is only one set of carding-machines, and the weaving is done with hand-looms. The quantity of both home and foreign wool used yearly at the three factories is about 212,000 lb.

The woollen manufactures indigenous to the Highlands are home-made cloths and tweeds, and hand-knitted hosiery and shawls. For these there is always a ready market. The shawls are valued on account of their lightness and warmth, and the home-spun tweeds are prized for their peculiarly comfortable and durable qualities, which render them more suitable than any other fabric for the use of sportsmen and tourists. To appearance these tweeds are somewhat coarse, but in reality they are softer and in some cases of finer texture than machine-made goods. Messrs Macdougall & Co., of the Royal Tartan Warehouses, Inverness and London, have for many years given special attention to the improvement and development of these tweeds and tartans, and have brought them into notice with the higher classes of society, thus obtaining for them their present celebrity.