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Notices.

Correspondence and items of interest bearing upon the Textile Industries, Technical Education, or other questions treated in this Journal, are solicited. Market reports, or notes respecting the position and prospects of our Irish industries, will be specially acceptable. Correspondents should write briefly and on one side of the paper. Foreign readers are invited to send reports, and to point out any facilities which may exist for promoting the interests of Irish manufacturers.

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The *Home and Foreign Linen Trade Directory* is now in preparation.



Learning and Earning.

AN open letter which is at once refreshing and encouraging to read may be found in the current number of the *Century Magazine*. Briefly, it is an account of the work of Trade Schools as at present established in America, and the communication is inspired by the magnificent endowment of the New York institution with half-a-million dollars by Mr. J. Pierpont Morgan. The schools so greatly favoured have now, after eleven years' growth, nearly 600 students, learning what to do and what to avoid in turning out thoroughly satisfactory work, scientific and practical, in plumbing, plastering, stone-cutting, painting, bricklaying, carpentering, and tailoring. Incidentally we get an insight into the general conditions and trades-union regulation of employment in the United States, and we gather that things are not always what they seem in the land of liberty. Besides the barriers by law established at the ports to prevent the ingress of skilled labour, the industries within are regulated and controlled and engineered by foreigners, who rule the labour market in the interests of their own nationalities. Native Americans have no chance of learning any trade within its own limits, and a mighty slim prospect of occupation if they become proficient outside of it. "The first step towards the remedy," it is said, "is the multiplication of trade schools, and the second is the insistence upon the free exercise of every man's right to earn his own living in his own

way. It is surely not too much for the American people to say that their own sons shall not only be permitted to learn trades, but shall be permitted also to work at them after they have learned them." Part of this difficulty presses upon us too, and we are even now, in all probability, entering upon a contest for the right of freedom of contract, which may end in—who can tell what? But we have, at least, freedom of entry to occupations, and are not affected by birth qualifications or under alien dictation as regards supplies of labour. It is pleasing to learn that a start, even though on a small scale, has been made by our American cousins towards furnishing open means of becoming proficient in trades, and we may wish them good luck in their efforts to give free labour franchise to all their sons, lineal and adopted. But we would that some wealthy and public-spirited citizen would so nobly give Belfast an opportunity of equipping young men for filling responsible positions in the world of work. It appears that the New York Trade Schools are sought, and eagerly sought, not only by pupils engaged in workshops during the day, but no less by numbers of young fellows who have finished a school course and are glad to learn trades apart from "humiliating and unpleasant surroundings." There are plenty of such young men about, and too many of them lapse into loafers, or, in their desire to wear a black coat and appear genteel, are wasted as clerks. They are victims of what has been called the vulgar prejudice against work which is in itself vulgar. Instead of this, the Trade School makes of them earnest and capable mechanics, ready and competent to fill positions of trust and importance, perhaps able to lead the way in trade improvements—the very men who are often most eagerly sought for and generally hardest to find. Many lads of good parts and promise now leaving school are almost certain to become waste products of society. A Trade School might so develop their inclinations and abilities as to make them valuable and esteemed members of the trade commonwealth, and do a great deal towards giving check to that essentially vulgar idea that there is vulgarity in work.

The Cotton Yarn and Cloth Trade of Ulster.

DURING the past few years there has been a marked development in the consumption of cotton yarns and cotton fabrics in the North of Ireland. Formerly the bulk of the imports of cotton yarns was taken up in the bordering of linen and linen cambric handkerchiefs, but at present, in addition to this, large quantities are absorbed in the manufacture of union goods of all descriptions. A few years ago, when coarse tow yarns were higher in price than the manufactured article warranted, manufacturers turned their attention to cotton warps as a substitute, with the result that a clean slightly cloth was produced at a lower rate than was possible with both linen warp and weft. This new article grew rapidly in favour with the manufacturers of aprons and pinafores, as well as with exporters, and although some classes of pure linen goods can now be made and sold at the same price as the union goods, the latter article continues to hold its ground, and is taken in preference, owing to its regular and slightly appearance.

Nor is it alone in the coarser textiles that cotton yarns have come into increased consumption, as large quantities are used in the production of shirting fabrics up to twenty hundreds (linen count). Large lots of these goods were, and still are, manufactured and imported from Lancashire, but the Irish manufacturer has entered largely and successfully into competition, so that the production of this article also has become an established branch of our local industry. Besides piece goods, a considerable production of union handkerchiefs is carried on, but latterly the manufacture of this article has somewhat fallen off, owing to the changes of fashion and to the extreme cheapness and beauty of the designs of the printed cotton handkerchiefs made up here. As a rule, purely cotton goods are not manufactured in Ireland, with the exception of some fine mulls, as it is found that the woven fabric can be bought from the Lancashire manufacturer at a lower rate than it is possible to produce it on this side, nevertheless the returns published of the imports of cotton yarns into Ireland during the past few years present a fair idea of the importance of this branch of our industry. For example, the average imports of cotton yarns during the years 1886 to 1890 into Ireland amounted to 2,716 tons, while for 1891 the imports amounted to no less than 3,633 tons, or an increase of over 33 per cent., thus showing a very rapid development.

In addition to the imports of cotton yarns, vast quantities of unbleached cotton cambrics are being regularly brought into this port. These cambric goods are bleached, printed, and made into handkerchiefs on this side, affording employment to some thousands of hands. This branch is now an established portion of our industry, and to such perfection have our local houses attained, that neither in England nor Scotland can they compete with us in turning out this class of goods. The designs produced in these handkerchiefs are chaste, varied, and beautiful, and when hemmed or hemstitched and finished in the same manner as linen cambric goods the handkerchiefs are marvels of beauty and cheapness. Up till the beginning of this year these goods were shipped in enormous quantities to America, but since the imposition of the McKinley tariff the exports have fallen off in a marked degree, and the trade has been in a rather depressed condition. This is to some extent explained by the fact of the Americans having commenced supplying themselves, but whether they will be successful or not in the long run remains to be seen. It is remarkable, however, that neither the English nor the Scotch firms can give the linen finish to this class of goods, and they are obliged to send them to this side for that purpose. This of itself gives us hope that the Americans will not have it all their own way, and that our exports across the Atlantic will be shortly revived.

Besides the American market, which by the way is the chief outlet for this class of goods, a very large trade is done in them with the London and Manchester shipping houses, but the competition has been latterly so keen among our local firms that rates have suffered from cutting. In our next issue we shall enter more particularly into details.



Common-sense Underclothing: A Seasonable Subject.

III.

FOLLOWING up the remarks in last month's issue as regards the maintenance, or preservation, or non-conduction of heat, we may turn again to the researches of Count Rumford, for conclusions very different to those generally drawn from them. Let a common error be first corrected, and the idea that any clothing is warm or cold be at once dismissed. There is no actual heat in clothes. As a matter of absolute fact there is no such thing as cold. There is certainly no such thing as a cold textile material. The thermometer, when placed between linen sheets or pieces of oilcloth, between woollen blankets or eider-down quilts, will record the same degree of warmth. The reason why there is a difference to the touch is that some materials conduct better than others, and the same variation in apparent cold is found in metals, so that silver feels warmer than gold, and both than lead. Thus our clothes have no warmth, but merely serve the purpose of preventing the loss of bodily heat, or, in the correct phrase, they arrest the radiation of heat, in greater or less degree, as they are slow or quick to give it passage. Wool is a good non-conductor of heat, and thus affords the sensation of warmth which makes it acceptable to some people. Glass, resins, ivory, and the lighter woods are still better non-conductors; but, as somebody once remarked, with perfect truth, these would form very inconvenient substances to be employed as clothing or wearing apparel. But although it might be thought, from what is at times written about wool, that it had a complete monopoly of keeping mankind warm, all the principal articles of which clothing is manufactured are excellent non-conductors of heat, and there is not much to choose between them. Dr. Krieger filled a sheet-iron cylinder with hot water, and this he covered with different stuffs, noting their effect in impeding the cooling of the water. "In investing the cylinder successively with a covering of wool, buckskin, silk, cotton, flax (always taking note of the temperature), he only found an insignificant difference, not exceeding 1 or 2 in 100." The experiments of Rumford to determine the relative powers of resistance to the passage of heat in several materials resulted in the following table,

Heat lost	Air. Seconds.	Raw Silk. Seconds.	Sheep's wool. Seconds.	Cotton wool. Seconds.	Fine lint. Seconds.
60°	38	94	79	83	80
50°	46	110	95	95	93
40°	59	133	118	117	115
30°	80	185	162	152	150
20°	122	273	238	221	218
10°	231	489	426	378	376
Total times,	576	1284	1118	1046	1032

The difference between wool at 1118 and flax at 1032 does not seem much to make a fuss about, but when Rumford's investigations are followed a stage farther the results are still more remarkable.

Heat lost, or amount of Cooling.	Sheep's wool, loose. Seconds.	Woollen thread wound round bulb. Seconds.	Cotton wool, loose. Seconds.	Cotton thread wound round bulb. Seconds.	Lint, loose. Seconds.	Linen thread wound round bulb. Seconds.	Linen cloth wrapped round bulb. Seconds.
60°	79	46	83	45	80	46	42
50°	95	63	95	60	93	62	56
40°	118	89	117	83	115	83	74
30°	162	126	152	115	150	117	108
20°	233	200	221	179	218	180	168
10°	426	410	378	370	376	385	338
Total times,	1118	934	1046	852	1032	873	786

In this latter table may be found the reason why of modern wool wearing, and there is still seen, as before, only a slight difference between the respective substances; but closer observation will reveal a marked disparity between the protective power of loose and twisted fibres always in favour of the former. It might seem unnecessary to put in air for comparison, but this has been included in the table of seconds for purpose. Rumford came to the conclusion that "heat is incapable of passing through a mass of air, penetrating from one particle of it to another." There is no fault to be found with the inference that woollen are warm so far as we are enveloped with a layer of air. The doubling of materials, according to both Krieger and Rumford, gave little increase of heat detained. It is upon the innermost garments, and upon the air in suspension in them, that warmth mainly depends. A fabric to be warm must be open woven. There is a result here which must be taken into consideration, a lesson which must be taken to heart by Belfast manufacturers, as flax manufacturers elsewhere are changing their front. Linen for underwear, as has been argued in these columns before, must undergo as great an alteration in structure as that between flannel and the Jaeger fabrics, to regain its old-time popularity among all classes and conditions of men.

It may be thought that this would bring both fabrics into line and leave no substantial separation between them. But, besides the superiority of flaxen fabrics from the hygroscopic point of view, there are other considerations to be taken to avizandum—as the curious old phrase for deferred judgment stands in Scotch law—when choice of being made of the most suitable material for underclothing. The slight superiority of wool in point of warmth becomes a detriment as far as health is concerned. What benefit is there in being so warm? The sensation is pleasant at first, but is soon lost as the skin becomes accustomed to it. Wool bases its case upon warmth, and makes, by further indulgence, fussy and fidgetty faddists of its adherents. Dr. Combe, although he upholds flannel, lays down a rule which would be far better obeyed by the use of linen. "The rule is, therefore, not to dress in an invariable way in all cases, but to put on clothing of a kind and quantity sufficient in the individual case to protect the body effectually from an abiding sensation of cold, however slight." The gulf between this sensible stipulation and the garments made to fit close at the wrist and ankles, so that no breath of fresh air should play upon the confirmed woollenite, is a very wide one. "The worst possible error," declares Pfarrer Kneipp, "is to mistake Warmth for Health, and to imagine you can protect the body from taking cold by keeping it warm! Warmth is by no means always synonymous with Health. On the contrary, over-heated rooms are just as completely unhealthy and weakening to the body as clothing that is inordinately warm. But woollen clothing is the worst possible thing for the skin; it makes the wearer in the highest degree sensitive and lessens his power to resist atmospheric influences—does this so-called Safeguard Clothing."

It is here that the important difference in structure between woollen and flaxen fibres comes in, and here that we part from experiments upon glass bulbs and metal cylinders. Unfortunately, except for Rubner's researches, science has nothing yet to show of the exact effect of underwear upon the human body, but the undisputed fact

wool is a natural admonition which deserves to be respected. But we do know that wool excites the skin, stimulates it, and, as woollenites maintain, promotes perspiration, although perspiration is a vital process which should be, and is, in perfect health, carried on without encouragement. It is in this respect that wool is warmer in wear than any trial with heat and metals will disclose, and through this that morbid susceptibility and enervation of the skin ensue. Dr. Mortimer Granville has entered his protest against taking the responsibility of heat regulation of the body too much out of the hands of nature; but wool-wearers must be, and must keep warm. On the contrary, flax is cooler in wear than any bulb and thermometer would show. It may be cold at first touch, but so is a cold bath. Its round, smooth, and glossy filaments are most refreshing and salutary in wear, a skin tonic which assists but in no sense interferes with the action of the skin, and so tends to the enjoyment of brisk and vigorous health.

For one other consequence of wool-wearing it must be insisted that it causes the decay of cleanliness. The fear of shrinking undoubtedly defers washing-day, and the natural colour of the clothes certainly encourages delay in cleansing. Directions for the "deodorisation" of bedding, and intimations that garments may be considered clean so long as they are free from "apparent" dirt, lead to the same end. It is claimed for wool that it removes, by virtue of a natural affinity, the waste products of the body; that the removal of the sebaceous secretions of the body "is better performed by the contact of woollen fibres than by those of linen or cotton;" and this is held to be presumably proved by "the experience of manufacturers of woollen fabrics, who find that soapy and greasy matters adhere so firmly to the fibres of wool." Upon Pfarrer Kneipp's authority we have an extract from a work by F. O. Grunfeld, entitled *Das Leinen in der Kulturgeschichte und in Haushalt*, to the effect that the hair of wool is "nothing else than a horny tissue which, like horn, bristles, feathers, whalebone, tortoise-shell, claws, hoofs, nails, horns, and scales, covers the exterior of the skin. The most recent investigations have discovered in this tissue a peculiar kind of grease called Lanoline, i.e., wool-fat, which possesses the wonderful characteristic of mixing as well with water as with pure fat. During the process of exhalation, secretions both of the sebaceous glands and of watery vapour collect in these horny tissues in increasing quantities. We see this in an especially prominent degree in the fleece of the sheep, which is composed of all these secreted matters, and is in an uncleanly condition, so offensive to the smell that it is in this respect surpassed by few other substances." If these functions are continued upon the person of the wool-wearer, it is at his peril, unless his clothes and his body are not occasionally but continually cleansed. That eminent physiologist Dr. Combe says that—

When the perspiration is brought to the surface of the skin, and confined there either by injudicious clothing or by want of cleanliness, there is much reason to suppose that its residual parts are again absorbed, and act on the system as a poison of greater or less power, according to its quantity and degree of concentration, thereby producing fever, inflammation, and even death itself; for it is established by observation that concentrated animal effluvia form a very energetic poison. The fatal consequences which have repeatedly followed the use of a waterproof dress by sportsmen and others, and the heat and uneasy restlessness which speedily ensue where proper ventilation is thus prevented, seem explicable on some such principle.

There is, besides, to be taken into account the well-founded belief that wool-wearers are more liable to contagion than other people, as well as the patent fact that wool becomes offensive to the smell after being long worn. It may easily be believed that Dr. Jaeger's absurd assertions about the attraction of noxious odours by vegetable fibres was nothing more than empty bluff and bluster to distract attention from the far greater affinity of wool for noisome exhalations. That is one of several issues which might be easily and authoritatively tested; another being the allegation by Dr. Hobein, military physician at Berlin, that micro-organisms are more frequently found in woollen than in any other cast-off clothing. In all respects, specially in regard to the serious danger indicated by Dr. Combe, the inevitable felting of wool through washing, when it is washed, makes it doubly unsafe as a next-to-the-skin fibre.

What is the conclusion of the whole matter? Unquestionably this. That, for body clothing, flax is, in some important respects, equal to wool and inferior to none, while it is, in other relations of the utmost consequence, far preferable. Scientific conclusions and centuries of personal experience are on the side of linen. Closer and more exhaustive inquiry into the relative properties of textile fibres would, we have no doubt, establish still more emphatically the superiority of flax for next-to-the-skin wearing, and fair trial by the people would soon leave flaxen underclothing without a rival.



A Strong Supporter.



It would hardly be right to speak of Archbishop Walsh as a recruit in the ranks of the supporters of technical, manual, and industrial training as part and parcel of our National System of Education. Dr. Walsh has expressed his views before now, but his definite pronouncement on the subject when addressing the annual meeting of the Society of St. Vincent de Paul will, we hope, attract that marked attention which is its due. His Grace is as high an authority on National Education as anyone in the country. He knows the wants and needs of the Irish people as well as, if not better than, most men. He is the spiritual head of the religion to which the vast majority of the Irish people belongs, and, as such, exercises, no doubt, a greater influence than any layman. The subject of National Education is distinctly within the Archbishop's province, and we gladly welcome him as a supporter of, and as a champion in, the cause of a really useful system of education. Dr. Walsh, in his speech to the Society of St. Vincent de Paul, did not mince matters or weigh his words in a delicate balance. He declared that, on the occasion of his first visit to the Orphanage some years ago, he had taken the liberty of suggesting that the time had come when it should no longer suffer itself to be "drawn along by that insidious current which, in so many respects, has proved mischievous, I must say indeed so disastrous, in its influence upon our system of education in this country. These are precisely the sentiments we have from time to time expressed; using them, however, not as a warning to one educational institution only, but as a general warning to all. Referring to the "lavish outpouring of public money" which maintains the present system, Dr. Walsh says that this lavishly endowed plan was from top to bottom a "gigantic and ruinous misconception." It omitted a provision for the introduction of a useful system of manual instruction—instruction which would teach the youth of the country to use practically their eyes, their ears, and their hands. No one in Europe or America, at the present day, who is in any way authorised by his knowledge of the subject to give his opinion, would for one moment recognise as truly National any system of education which was based on a purely literary basis. And this to all intents and purposes our present system is. We have before now given every credit to the efforts which the Commissioners have made, and are making, to introduce manual teaching; we by no means intend to retract what we have said on former occasions; but it must be recognised that what the Commissioners have done is but a drop in the ocean of what has to be done. What is required is not personal effort such as Dr. Joyce's, nor profound sympathy such as Sir Patrick Keenan's, but an entire revision of the system, the rules, and the regulations which govern the National Education of Ireland. The fundamental ideas and theories upon which the present system is based must be replaced by others of a more practical character, and these again must be put into practice in a useful and intelligent manner. Dr. Walsh seems to think that some "not very friendly critics" will denounce him in chorus for having spoken as he did speak, and will take up the defence of education in Ireland against "what they will call the undisguised retrograde policy of Archbishop Walsh." We certainly trust that there are no such unmitigated cranks in the country. There are a great many things in Dr. Walsh's educational programme to which we should hesitate to give in our adhesion; and there are many on which, no doubt, the "not very friendly critics" disagree with him; but surely there is no one who will attack him for supporting and advocating the revision of the system under which the enormous funds granted from the Imperial Exchequer for education in Ireland are being spent. Dr. Walsh does not, any more than we do, deny the absolute necessity of a National literary education, but he asks for a concurrent and equally widely distributed and accessible system of industrial education. He recognises, as do all advocates of technical instruction, that in the community there are many to whom, by their talents, a literary education is absolutely more valuable than would any manual, technical, and industrial training be. For the National system should provide encouragement and facility for

advancement. No matter how poor or lowly, a student of pronounced and marked ability should have the means of entering upon those higher branches of education which are now closed to him. If, then, Dr. Walsh has entered upon a retrograde movement with regard to National Education, we have been moving backwards for years, and we will claim to have been doing so in very good company. We know of no country, claiming to be civilised, in which National Education, State-endowed or voluntary, is in such a backward and misguided condition as it is in Ireland; and that, too, in the face of the fact that poor old Ireland needs a perfect system far more than do most of her neighbours, far or near. We are glad to note that the Archbishop made a strong point in defining what manual training in schools really means. Much of the opposition which its introduction has met with has been caused by a foolish or wilful misconception of its meaning. It does not mean the teaching of trades. It simply means the teaching of children to be handy—that is, to be able to use their hands at various simple kinds of work. The teaching of trades is a thing quite apart from a system of primary education. It can be taken up with advantage by the State, by corporate bodies, by trade societies, or by individuals, but it is supplemental to and comes after primary education. What we claim is that the teaching of trades and industries will be immensely facilitated by the manual training of children in primary schools; and we claim, further, that even those children who do not, in later youth and early manhood, learn a trade, will be benefited by such training, and will feel its advantages through life.

INDUSTRIAL EDUCATION.

GENERAL BOOTH, in *Darkest England and the Way Out*, thus writes in regard to the industrial training of children:—
“I propose at the earliest opportunity to give the subject of the industrial training of boys a fair trial, and, if successful, follow it on with a similar one for girls.

“I am nearly satisfied in my own mind that the children of the streets, taken say at eight years of age, and kept till say twenty-one, would, by judicious management and the utilisation of their strength and capacity, amply supply all their own wants, and would, I think, be likely to turn out thoroughly good and capable members of the community.

“Apart from the mere benevolent aspect of the question, the present system of teaching is, to my mind, unnatural, and shamefully wasteful of the energies of the children. Fully one-half the time that boys and girls are compelled to sit in school is spent to little or no purpose—nay, it is worse than wasted. The minds of the children are only capable of useful application for so many consecutive minutes, and hence the rational method must be to apportion the time of the children; say, half the morning's work to be given to their books, and the other half to some industrial employment; the garden would be most natural and healthy in fair weather, while the workshop should be fallen back upon when unfavourable.


“By this method health would be promoted, school would be loved, the cost of education would be cheapened, and the natural bent of the child's capacities would be discovered and could be cultivated. Instead of coming out of school, or going away from apprenticeship, with the most precious part of life for ever gone so far as learning is concerned, chained to some pursuit for which there is no predilection, and which promises nothing higher than mediocrity, if not failure—the work for which the mind was peculiarly adapted, and for which, therefore, it would have a natural capacity, would not only have been discovered, but the bent of the inclination cultivated, and the life's work chosen accordingly.”

Practical Notes on Textiles: Linen Bleaching.

II.

(Specially written for this Journal.)

Historical.



DURING the middle of the last century a great amount of interest and attention was directed to Egyptian relics; considerable discussion arose among learned antiquarians in connection with the nature of the fibres from which the mummy cloths were manufactured. It was questioned whether the “fine linen” for which the Egyptians possessed a historic reputation was not really a manufactured fabric from the *Gossypium herbaceum*, or cotton fibre, rather than the *Linum usitatissimum*. Up to the year 1750 it was asserted and maintained by almost all our pundits that the fine linen samples, or mummy cloths, were made from cotton; and such was the influence that writers upon the

subject had in forming public opinion, that the question was regarded as settled once and for all time, and this opinion was retained, despite all proof to the contrary, for more than half-a-century. In the early portion of the present century, Mr. Thomson, F.R.S., a calico printer, of Clitheroe, Lancashire, obtained specimens of the cloths from various sources, which he found in every case to be produced from the flax fibre, because the threads were round and smooth, whereas the threads of a cotton fabric he found to be angular and sharp; this was confirmed by numerous experiments, chemical and microscopic. Thus was set at rest for ever the vexed question of the essential origin of the “fine linen” of Egypt. In Baine's *History of the Cotton Manufacture* there are some beautiful drawings, copied from the originals, made by Mr. Bauer, of flax and cotton fibres under the microscope. These illustrations show the flax fibre a perfect round tube, smooth and jointed; the joints occur with almost perfect regularity at the rate of from 400 to 800 per inch, the finest fibres containing the greatest number. Of course it is necessary, in following out these experiments, to make use of a microscope with a power of 400 as a magnifier. Now, it would appear that the flax plant has been cultivated and converted into fabrics for the use of mankind from a time beyond historic record—probably, for anything we know to the contrary, before the building of the Tower of Babel or the Pyramids.

Hygienic Estimate of Linen by Ancient Egypt.

Considering the myriads of human beings who have passed away in the land of Egypt alone, taking no account of other countries which more or less made use of underlinen, it would be monstrous, if not imbecility on our part, to say they were mistaken in wearing such apparel because of its unhealthy, insanitary action; yet this is actually what in substance is preached by latter-day zealots (in a new sanatorial gospel crusade) who have just come on the scene, after thousands of years have passed, to prove that it was all wrong. As a matter of necessity, convenience, luxury, and health, linen will be worn by those who know its value as underwear just as it was in Ancient Egypt. It has been repeatedly asserted that pure manufactured linen is, under ordinary circumstances, indestructible; the proof is given in the mummy cloths; and further, in testing under every conceivable operation incidental to wear and tear, no fibre can be found so suitable for the production of bank notes as that derived from flax. This may be considered the proof *und voce*.

The Bleaching of Linen.

There are some removable causes militating against a proper expansion of the linen industry. Perhaps it is not too much to say that the general consumer is mainly to blame for an inferior article. The demand for a *snow-white bleach* is one cause which, no doubt, is facilitated by merchants and retailers encouraging this very much mistaken notion that a snow-white bleach must be the perfection of a linen fabric. There is no thought or reason brought to bear upon the fact that a bleach of this nature cannot be obtained except at the expense of weakening the fabric. The same thing, for example, will be found in other articles; ginger loses its strength in bleaching, and the snowy whiteness of sugar is obtained by the loss of its saccharine qualities. The pure *snow-white* of a grass bleach is beyond our reach except by artificial means, which are risky in their action; and we have known linen manufacturers refuse orders where the conditions demanded a snowy whiteness; they have declared it would imperil the character of their productions. Yet these men have survived the loss, and have regular repeat orders both from home and abroad, and their goods will sell in the United States even if 200 per cent. of a tariff duty was imposed. The fact is, the linen trade has suffered immensely by yielding to the cry for snow-white cloth to satisfy fastidious custom; while, at the same time, housekeepers constantly speak of the durability of linen as much inferior to that made in the days of their grandparents.

Laundering of Linen.

Again, perhaps worse than all is the usage which linen textures of every description receive in many laundries, the worst treatment being meted out to table napkins and table-cloths, showing years of wear, although only a few months, or in some cases weeks, from the manufacturers, who are of course blamed on all sides for the weakness of their goods. An examination of some napery which had been tortured in the wash showed heavy incrustations of a substance subsequently found to be carbonate of lime; the fabric gave about 8 per cent. ashes, mostly composed of calcium carbonate. This shows that the actual deposit of such a large quantity of an inorganic substance, spread between and over the fibres, must exercise a very pernicious

effect on the strength and durability of a fabric; the presence of this mineral substance acts as a grinding material, wearing out the warp and weft fibres in the handling as well as in the washing. It is, we are sorry to say, quite a common practice in large hotels, restaurants, etc., to damp linens with lime water, and to put the cloths through squeezers, in place of re-washing; slightly used table-cloths and napkins are thus restored to a clean appearance without further labour. But this results in both injury and loss. The crystals formed between the fibres expand, owing to the lime water becoming transformed into caustic lime in the fabric; the hydrate of lime, through its contact with atmospheric air, becomes a carbonate, so augmenting its volume, which again works detrimentally on the fibre by tearing it asunder, the carbonate of calcium thus formed acting like the teeth of a saw. In fact, quite independent of the corroding action of lime water, there is the added evil of a direct mechanical action that no amount of strength in the fabric can withstand. This vicious practice ought to be stamped out if people care to preserve the durable properties of their choice linens. But if the treatment linen receives at home laundries is bad, the French system is worse, Parisian blanchisseuses having a bad reputation in this respect. As for India, Irish linen suffers tremendously from this cause, the native washerman utterly ruining the fabric in the course of two or three experiments. This is a grievous drawback to the consumption of linen, especially for underwear and bed use, in a country where it is such a luxury.

Yarn Boiling and Bleaching.

No doubt our linen manufacturers are only too willing to make thoroughly sound and serviceable goods if supported by the public, but with the continued call for an absolute white it is extremely difficult to deal with the question. One of the greatest drawbacks to bleaching is to be found in the yarn boiling. When the ordinary caustic soda ash, rendered caustic by the addition of lime, is used, it is in its action a potent cause of injuring and depriving the yarn of its nature; the remaining vegetable matter becomes a fixed quantity which the after process of bleaching cannot eliminate; thus the fibre becomes weakened, and the further evil of extra sizing, to restore the strength for weaving purposes, intensifies the mischief when produced as a fabric. The use of carbonated soda, on the contrary, preserves the best value in the yarns—better for weaving, as well as for the bleacher, who is enabled to produce a superior white bleach with a sounder fabric. It is well known that the bleach from caustic soda is a sulphurous white, not really what it seems; it no doubt may look well for present uses, but the good looks are obtained at the expense of one of the most valuable properties of the fibre, its lubricating power. The yarn is put into water, worked sharp in extra strength of caustic soda, without any motion; it is only a mere steeping, or as it is called "sweetening," and the real point for success is often grossly neglected, and that is, a thorough good washing. With only a very little care there need be no broken yarn, or, at the most, a very small percentage compared to many operations. Let the carbonate of soda, along with the addition of barilla, settle well in the pans, and it will be found that the product is a good, round, smooth, strong thread that cannot be converted into hairy linen cloth. Chemical agents employed act differently at various strengths and temperatures. The successive processes of immersion in a solution of chlorine may be easily overdone at one or both stages in a process to the injury of the goods. When the present method of bleaching was first introduced, it was said it "rotted the goods and killed the workmen;" for these chemical agents are, like fire and water, good servants when properly applied with knowledge, but most destructive if not controlled. It may be taken as a general rule that, as the strength of a solution is increased, the yarns and fabrics immersed in such solutions become in inverse ratio diminished in power of resistance or strength.

Technical Knowledge.

The real truth is, head, hand, and heart must all combine in the production of articles used in everyday life. This fact is becoming gradually realised; foreign competition, with hostile tariffs, is increasing, and the necessity of altering our conditions of manufacturing is as clear as noon-day. The old twaddle of giving away trade secrets is exploded, and there is only one possible way to contend with foreign rivals, and that is by the aid of technical institutions to improve our industrial skill. No other course is open, and every endeavour towards this object ought to receive unstinted encouragement. Such institutions, in the midst of industrial centres, foster the latent and inventive powers of our operatives; in short, are the *alma mater* of a manufacturing district.



The Lancashire and Scotch Cotton Industry.



IN the report of the Inspector of Factories, just published, Mr Henderson, Superintending Inspector for Scotland and the North of England, thus writes as regards the condition of the cotton manufacture in Lancashire, and supplies some interesting notes respecting the cost of production in both places. Speaking of the private firms he says:—"For a long period there has been a growing tendency on the part of private capitalists to withdraw from the business. I referred to this last year in some remarks I made with respect to the Blackburn district, and they are applicable to a much wider area. It is distressing to witness the havoc which has been made in some of the picturesque valleys of Lancashire by the pressure of modern emulation and competition. Factories and cottages closed and untenanted, many of them unroofed and in ruins, meet the visitor almost at every turn, and they give some indication of the great sacrifice of capital which must have been made before the present hopeless condition of things has been reached. The cotton spinner and manufacturer who owns his mills and machinery himself promises soon to become extinct, and we shall then be reduced to the position which obtains in the manufacturing districts of America. The only employers of labour will be the limited companies or corporations. That this revolution is likely to prove beneficial to the operatives I think is open to question, and they would do well to weigh the point carefully. The cotton industry has been prosecuted in this country during the last 30 years with great success; it has expanded during that time more rapidly than the most sanguine ever anticipated. The tendency at the same time has been to send the smaller capitalists to the wall and to crush out the individual employer, who finds it more and more difficult to compete with large companies owning enormous factories equipped with the most modern machinery and appliances. Another influence which has operated much in the same direction is the increasing demands upon manufacturers by the Legislature, and the growing difficulties of dealing with the workpeople and their representatives. There can be no question about the fact that of late many employers have withdrawn from the cotton industry at a serious sacrifice, rather than face the increasing worries and annoyances which they find themselves compelled to face. Upon the paid official of a public company these fall lightly comparatively speaking, and the companies, or 'co-ops.' as they are locally termed, promise to have the trade very much to themselves by-and-by. At the present time, of the many new cotton factories being built or projected in my district I cannot recall one of any importance which is owned by a private employer.

Lancashire Weavers work Four Looms.

"An interesting fact has recently come to my knowledge which bears upon what I said in my last report to you about the competition between Lancashire and Scotland in the cotton manufacture. Between the time the remarks I made were written and your report was published, the Glasgow Trades' Council was approached by a deputation from the weavers of one of the cotton weaving factories in Glasgow, and it was represented that they were being most unreasonably dealt with, being paid low wages, and also called upon to work three power-looms each instead of two. The assistance of the Trades Council was claimed, as a strike was contemplated. Before taking action the Council determined on making some inquiry, and a representative was sent to Lancashire, who discovered that there were numbers of the weavers, both men and women, worked four looms at the same class of work without difficulty; nay more, it also came out, as a result of this inquiry, that the Scotch manufacturer actually paid more for his weaving than his Lancashire competitor, and yet his weavers could not make half the wages of those in that county. We need go no further than this for an explanation of the reason why the Scotch manufacturer fails to resist Lancashire competition. He pays a high rate for weaving his cloth, and his machinery produces less, because his workpeople will not alter their accustomed habit of working only two looms.

American Tariff and a new Linen Loom.

"Much interest has been felt among both manufacturers and their workpeople during the past year as to the probable effect upon British trade of the new American tariff. My impression is that it is still too soon to form a conclusive opinion upon the point, but so far I have not found that manufacturers on this side apprehend that it will do them serious injury. It has in some cases done a good deal of mischief by deranging trade, and by causing producers to spend more money in adapting their machinery to the new conditions. In this respect it has operated as a stimulus to invention. A few weeks ago I saw an elaborate loom being constructed in a machine shop near Manchester, which is intended to weave fine linen damasks in a manner which will bring them outside the pale of the new tariff; this may possibly lead to the introduction of what is practically a new fabric not only into the market of the United States, but into the markets of the whole world. Such of our manufacturers, both of cottons and woollens, with whom I have conversed of

The Belfast Linen Trade Report.

DRAWN UP BY THE LINEN TRADE BOARD, APPOINTED UNDER THE SANCTION OF THE BELFAST CHAMBER OF COMMERCE.

It can scarcely be said that there is any change for the better in trade, which is still very quiet in the home department as well as with the Continent. It is, however, satisfactory to find that the falling off in the general shipping trade is more than counterbalanced by the volume of business done with the United States and Canadian markets, as appears by the Board of Trade returns for the past month.

FLAX.

Continued firmness in price marks the course of the raw material, and both home and foreign supplies are held for full rates, the tendency being still in favour of holders. Pending the opening of new season, sales have been small of late.

The following reports regarding the Irish crop were received from our correspondents within the past few days:—

BALLIBAY—Flax pulling has commenced in this district, but the crop will not be an average one. **BALLYMENA**—Pulling has also commenced here, and will be general in about a week. Crop appears to be short and light. **COLERAINE**—In a few days pulling will be general in this locality. Weather for some time past has been most favourable for ripening the crop, so that strength and quality of fibre may be expected if harvesting is completed under favourable circumstances. The straw is reported to be looking better than was anticipated. **COOTEHILL**—Owing to the late dry weather flax has improved very much; pulling has commenced, and it is expected there will be a fair average crop. **COMBER**—Flax crop looking fairly well; pulling just started. **LIMAVADY**—Pulling also going on in this district; crop is thin, and will be much smaller than last season's. **MONAGHAN**—Pulling general, and a considerable quantity in the water already. Flax very variable; some fields good, but a large proportion under the average bulk.

YARNS.

A very fair and steady demand has been kept up for both line and tow yarns since last report, and spinners are still to some extent under contract, so that they are careless about larger commitments, in the face of a probably higher level of prices for flax.

The export demand has been considerable of late, the shipments for July for the United Kingdom being upwards of 30 per cent. more than the same month last year. Foreign spinners are reported to be well supplied with orders, and prices generally well maintained. In our market the quotations of last month have been firmly adhered to in regard to all yarns, with the exception of a few numbers of tow wefts, which are fractionally cheaper, as noted below.

BROWN POWER AND HAND-LOOM LINENS.

Though a fair amount of business is doing in light power-loom bleaching cloth, the prices obtained are very poor and unremunerative. Medium and heavy grades, of which there is a much smaller production, are in moderate demand, but without any improvement in prices. Ballymena linens are rather dull, but the present production is about taken off, though prices are not any better. Rather more doing in County Downs at firm prices, and supplies on the market are very small. Cloth for dyeing is quiet, and rates without change. In dress linens only a trifling business doing, the season being over so far as home demand is concerned. Roughs of best quality move off pretty

well, but for common grades demand is slow, and stocks somewhat larger. Drills are also very quiet, but glass-cloth, crash, canvas, and some other makes of coarse linens are in tolerably good demand, chiefly for shipping account. The handkerchief trade can scarcely be said to be any better; both linen and cambric, whether power or hand-loom, are still slowly moving, and prices are bad. For power-loom diapers and damasks there is a fairly good demand, but hand-loom goods are not at all brisk.

BLEACHED AND FINISHED LINENS.

Home Trade.—The past month has been an extremely quiet one, so far as relates to this branch of trade, the business doing being of a merely sorting-up nature. The continued depression in other textile industries—cotton, wool and silk—is also felt in the linen centres, though probably not to the same extent.

Continental.—With the exception of a trifling increase from Germany, amounting to 3 per cent. as disclosed by the Board of Trade returns for July, all other countries show a considerable falling off; the previous extra large shipments to Spain having given place to a great reduction for the past month.

United States.—As a set-off against the decline in the shipping trade with other countries, the quantity of goods exported to the States appears to be still on the increase, the aggregate of piece linens being upwards of 26 per cent. more than for July, 1891.

Other Markets.—British North America figures as a much larger customer than in same month last year, the increase being over 40 per cent. A proportion would doubtless be to replace stocks destroyed in the great fire at St. John's. West Indian, South American, and all other markets show a diminished consumption for the month.

For the seven months ended July 31, the total quantity of linen piece goods exported from the United Kingdom shows only a fractional increase of less than 1 per cent., which contrasts unfavourably with the position to the end of June.

EXPORTS OF BRITISH AND IRISH PRODUCE AND MANUFACTURES.

SEVEN MONTHS ENDED 31st JULY.		1891.	1892.
Animals, living	...	£337,592	£354,491
Articles of food and drink	...	5,669,794	5,398,658
Raw Materials	...	12,508,355	10,763,080
Articles manufactured and partly manufactured, viz. :—			
A. Yarns and Textile Fabrics,	...	62,017,816	58,419,453
B. Metals and Articles Manufactured therefrom (except Machinery),	...	24,685,843	19,326,064
C. Machinery and Mill Work,	...	9,423,097	8,930,947
D. Apparel and Articles of Personal Use,	...	6,389,512	6,133,309
E. Chemicals, and Chemical and Medicinal Preparations,	...	5,284,859	4,891,356
F. All other Articles, either Manufactured or partly Manufactured,	...	19,094,019	16,549,369
G. Parcel Post	...	600,477	557,872
Total value,		£146,011,364	£131,324,599

Prices Current for ordinary Line and Tow Wefts. August 13th, 1892.

LEA NOS.	14	16	18	20	22	25	28	30	35	40	45	50	55	60	65	70	75	80	85	90	100	110	120	130	140	150	160
Line Wefts	—	—	—	7/6	6/9	5/9	5/3	5/-	4/7½	4/3	4/1½	4/-	3/10½	3/9	3/7½	3/7½	3/7½	3/7½	3/9	3/9	4/-	4/1½	4/4½	4/7½	4/9	5/-	5/3
Tow Wefts	5/9-	5/1½	4/10½	4/9	4/7½	4/6	4/4½	4/3	4/1½	4/-	3/10½	3/9	These prices are per bundle of 60,000 yards of grey Yarn, subject to the usual discount for cash.										120 threads 2½ yds.—1 lea 12 leas=1 hank 16 hanks 8 cuts=1 bundle				

the subject of the American tariff, say that its influence so far has been chiefly to compel them to go in for the production of a finer and more expensive class of goods. They treat the prognostications of the American press about the destruction of their American trade lightly, as they are satisfied that with this class of writers the wish is father to the thought. In this country we possess an important advantage as manufacturers of

textile fabrics in our climate, and, although we are ever ready to abuse it, it is a lucky thing for us that no foreign tariff can deprive us of that. An Oldham millowner could live comfortably on the extra waste made in Fall River spinning mill, and the finer the quality of the material, the greater the difficulties which have to be encountered in its production on the other side of the Atlantic."

Exports of Linen Yarns and Linens from the United Kingdom for the Month ended 31st July, 1892; and in the Seven Months ended 31st July, 1892, compared with the corresponding periods of the Years 1890 and 1891.

COUNTRIES.	MONTH ENDED 31st JULY.						SEVEN MONTHS ENDED 31st JULY.					
	Quantities.			Declared Value.			Quantities.			Declared Value.		
	1890	1891	1892	1890	1891	1892	1890	1891	1892	1890	1891	1892
LINEN YARN.	Lbs.	Lbs.	Lbs.	£	£	£	Lbs.	Lbs.	Lbs.	£	£	£
To Germany,	264,900	224,800	241,100	20,467	17,868	19,681	1,721,300	1,958,100	1,650,800	140,481	160,012	137,408
Holland,	207,300	216,100	101,000	7,107	7,776	3,770	1,262,500	1,339,000	1,045,100	45,129	46,741	33,463
Belgium,	170,200	111,500	124,700	11,409	9,602	9,494	997,000	990,700	811,700	76,988	83,163	63,450
France,	111,800	115,100	78,100	12,122	12,626	8,946	824,000	815,100	768,400	88,172	90,182	86,586
Spain and Canaries, ...	362,000	335,700	714,700	13,317	12,449	24,995	2,307,600	2,304,000	4,012,700	32,966	83,131	141,506
Italy,	32,900	20,700	10,600	1,625	1,018	470	319,000	225,300	253,600	15,379	10,986	11,721
United States,	56,200	26,100	55,400	1,383	826	1,979	707,600	224,700	300,400	17,944	8,518	10,096
Other Countries,	105,600	120,600	206,800	4,742	5,009	8,969	943,300	959,200	1,114,100	42,206	43,270	48,417
Total,	1,310,400	1,170,600	1,532,400	72,172	67,174	78,304	9,082,300	8,816,100	9,961,800	509,265	526,008	537,647
LINEN MANUFACTURES.	Yards.	Yards.	Yards.	£	£	£	Yards.	Yards.	Yards.	£	£	£
To Germany,	251,000	284,700	275,700	11,951	13,471	13,124	2,013,900	2,192,300	2,196,200	96,775	105,780	106,617
France,	308,900	210,800	134,100	14,669	9,772	6,469	1,674,000	1,215,800	1,161,600	75,235	54,725	52,266
Spain and Canaries, ...	130,800	135,900	71,300	5,122	5,523	2,453	831,800	1,015,500	1,244,600	30,411	36,423	50,769
Italy,	66,500	65,300	48,400	3,042	3,052	2,079	548,100	543,900	635,200	22,942	23,368	27,806
United States,	11,022,200	7,816,800	9,916,900	229,206	159,713	202,723	67,201,100	48,957,200	56,827,700	1,333,060	1,020,792	1,165,643
Foreign West Indies, ...	2,369,300	1,747,700	542,700	47,313	31,233	10,288	14,155,300	9,711,100	11,488,000	271,196	191,675	220,015
Mexico,	188,600	158,300	93,300	5,129	3,646	2,479	1,310,500	1,023,500	798,000	31,820	25,040	19,961
United States of Colombia,	463,800	402,200	344,000	7,104	7,323	5,518	2,151,600	2,069,500	2,345,200	35,067	36,426	38,721
Brazil,	235,900	283,800	235,800	8,333	9,326	6,936	1,671,700	2,180,500	1,425,800	56,978	71,463	40,618
Argentine Republic, ...	154,700	101,900	174,400	3,572	2,001	5,204	675,600	407,600	472,700	19,652	9,116	14,111
Philippine Islands, ...	233,800	45,200	10,500	4,184	909	401	533,500	686,100	221,300	9,950	12,352	4,197
British North America	606,700	755,800	1,061,000	13,298	12,532	21,363	3,938,600	4,693,600	5,310,300	82,196	90,134	102,218
British West India Islands & Guiana } Do. East Indies, ...	184,100	173,800	83,900	3,898	3,964	1,548	1,216,700	1,137,100	953,900	25,032	22,726	19,811
Australasia,	1,270,300	1,672,200	1,238,000	6,791	6,428	6,731	2,097,600	1,796,100	1,756,400	58,381	50,899	49,135
Other Countries,	1,451,100	1,392,300	1,202,100	35,709	46,418	31,503	7,733,800	7,517,500	7,017,300	223,117	214,771	187,280
Total Plain, Un- bleached, or Bleached }	17,060,100	14,086,900	14,312,200	383,907	311,035	308,401	10,630,540	85,279,400	94,370,000	2,349,805	1,918,499	2,060,059
Total Checked, Printed, or Dyed, and Damasks or Diapers,	1,832,600	1,216,200	1,113,400	38,019	29,851	31,255	9,734,300	7,491,900	6,743,200	218,659	190,329	170,326
Sail Cloth and Sails, ...	277,600	208,500	234,100	11,796	9,461	10,395	2,193,000	1,878,300	1,695,600	96,067	84,980	78,303
Total of Piece Goods, ..	19,170,300	15,511,600	15,659,700	433,722	350,347	350,051	11,823,270	94,649,600	102,808,800	2,664,531	2,193,808	2,309,331
Thread for Sewing, ...	Lbs.	Lbs.	Lbs.	£	£	£	Lbs.	Lbs.	Lbs.	£	£	£
	286,900	214,400	190,600	33,263	27,059	24,279	1,777,300	1,466,100	1,426,300	213,250	182,064	178,180
Other Articles,	119,438	107,036	91,092	644,311	570,588	530,808
Total Value of Linen Manufactures,	586,423	484,442	465,422	3,522,092	2,946,460	3,018,319

Importations of Flax—Dressed, Undressed, and Tow or Codilla of:

COUNTRIES.	MONTH ENDED 31st JULY.						SEVEN MONTHS ENDED 31st JULY.					
	Quantities.			Value of Imports.			Quantities.			Value of Imports.		
	1890	1891	1892	1890	1891	1892	1890	1891	1892	1890	1891	1892
From Russia,	Cwts.	Cwts.	Cwts.	£	£	£	Cwts.	Cwts.	Cwts.	£	£	£
	127,050	132,808	117,020	161,571	177,030	157,481	974,326	827,222	927,792	1,253,683	1,089,442	1,208,469
„ Germany,	2,162	4,276	836	2,433	4,750	1,281	18,541	35,373	39,344	30,667	47,499	43,424
„ Holland,	1,945	5,711	5,170	3,075	14,056	6,765	80,193	62,968	74,873	218,734	165,074	167,327
„ Belgium,	15,806	16,963	13,654	27,646	45,881	34,698	185,408	200,626	191,719	495,635	562,530	504,131
„ Other Countries, ...	3,644	2,109	3,983	4,928	2,818	6,251	29,732	69,077	27,021	39,061	82,712	31,619
Total	150,607	161,867	140,723	199,653	244,535	206,476	1,288,205	1,195,266	1,260,749	2,037,780	1,947,307	1,954,970

Monthly Reports.

(From our own Correspondents.)

Whilst we endeavour to obtain the most reliable reports from the best sources of information, it will be understood that we do not hold ourselves responsible for the views of our correspondents.

Irish.

DUBLIN.—In the woollen centres trade shows some slight improvement, the general tone being somewhat steadier than hitherto. Both native and colonial wools are pretty firm in regard to price, but yarns show no sign of any material change. In prices business is fairly steady, worsted coatings and linings being in demand. The market for linen shows no apparent change, the inquiry being still moderate at previous prices, which are being maintained. The latest Dublin quotations for wools are:—Supplies moderate; demand cautious; hoggets, 8½d. to 9d.; ewe and wether, 8d. to 8½d.; seaside, 7d. to 7½d.; mountain, 6d. to 6½d. Silks and poplins unchanged; but of them I shall have more to say anon.

Ireland and Chicago.

Mr. Peter White, who has just returned from America, gives some interesting information about the preparations at Chicago for the Exhibition. As regards Ireland, the "Irish Village" will be the chief centre of industry, more especially as I understand that permission has been obtained to make sales in that portion of the buildings. As regards the formation of the village, many friends have come forward to assist Lady Aberdeen, and amongst others Archbishop Fahan has given her an order for a complete suit of vestments, as have also Archbishop Ryan and Cardinal Gibbons. The cardinal's order is for a complete suit of vestments in which to celebrate High Mass. The vestments are to be made of Irish poplin, and hand embroidered; and from this it would appear as though there were an opening in America for this industry. These vestments will be shown in the Women's Department at the Exhibition, and not only will they be labelled with a full description of the source of their origin, but orders will be booked for similar articles. So far this is entirely satisfactory, but I want to call attention to what Cardinal Gibbons is reported to have said on the subject. His Eminence stated that "if vestments can be produced in Ireland at all equal to those made in Germany, very large orders are likely to come to Ireland from the American clergy." This is directly confirming the position I have all along taken up. Provided the goods are equal to and as cheap as others, Ireland will get orders; in other words, she must be able to compete without fear or favour if she is to obtain a market for her goods. The American clergy are quite willing to obtain their vestments from Ireland, provided they cost no more and are as durable and good as those they have hitherto got from Germany. Ireland and Germany stand on the same footing as regards tariff charges, and that there should be no difficulty in the way of securing this outlet for some of our manufactures.

Technical Education.

Lord Meath has been moving in the matter of technical education for the people of Bray and the neighbourhood of that township. A provisional committee has been nominated for this purpose, with power to add to their number, and with instructions to communicate with the local authorities and individuals, and to take steps for forming a permanent committee, representative of all creeds and classes, for the purpose of carrying out the idea. A programme has been promulgated for the establishment of classes for—1, cooking (cottage, plain, and high class); 2, laundry work; 3, scientific dress cutting and making; 4, modelling; 5, drawing; 6, manual instruction; 7, horticulture. It is also in contemplation to hold classes for the better preparation of teachers in some of these subjects. Further, the initiators of the movement resolved to "invite persons interested in the subject in Enniskerry, Dalkey, Killiney, Greystones, and Kingstown to assist in carrying the above programme into operation during the ensuing winter, and to issue a circular asking the people of Bray to subscribe, so as to carry out the proposed programme." This is the second of the townships round Dublin which has moved in this matter. In the Pembroke township Lord Pembroke's munificent gift forced, so to speak, the hands of the authorities and compelled them to action. Bray has had to move of its own accord, and has done so to some purpose.

Irish Lace.

I have not much to say on this subject. Next month I hope to be in a position to report favourably on the advance in work and design of Irish laces during the past year. By that time the annual exhibition of these fabrics will have taken place at the Horse Show. We shall have had the opinions of the official judges, and we shall know the prize-winners. From what I hear, all the old schools will well maintain their reputation, and some new competitors for favour will be in the field. Meanwhile, amongst her other labours Lady Aberdeen has been endeavouring to open up a wider American market for these delicate fabrics. She has made arrangements by which a number of houses in America in the large cities have consented to act as depôts for the sale of Irish lace, and this, no

doubt, will open up what has hitherto been the best market for them. The Irish Industries Association, too, is putting through, I understand, larger quantities, so that work is ample for all at present engaged in the production of lace, with lots of room for many more capable and busy hands.

The Industrial League.

I had an interesting interview with Mr. Thomas Elliott, of Weavers' Square, the other day. Our conversation was mainly about the Industrial League, but naturally turned a good deal on silks and poplins, which are Mr. Elliott's special manufactures. As to the League, Mr. Elliott is firmly convinced that the calling upon Dublin traders by deputations is doing good. He holds, and he ought to be able to form a fair judgment, that many Dublin shops have long since become mere distributing agencies for foreign goods. They have, from one cause or another, drifted into this position, and without some special effort they will not get out of it. Mr. Elliott is prepared with examples to prove his case, and without mentioning any names he told me of one instance where, though he had been declined an order for certain goods, a London traveller was immediately favoured with an order for exactly the same article. He is also, by the way, a firm advocate for demanding Irish goods from the shopkeepers. Mr. Elliott is far too shrewd a business man to expect the public either to take what they do not want or what they do not like because it happens to be Irish; but he holds that they should make an effort to obtain what they want of Irish manufacture, and not take the first article offered without endeavouring to find as good value in home products. With this view none can quarrel, the only doubt being, will the public take the trouble to ask for Irish articles? As to silks and poplins, Mr. Elliott deplored the loss of the American market, which, he says, is practically shut to these manufactures. He also had a good deal to say about the treatment of Irish silk weavers over the decoration of the Mansion House Ballroom. But this latter is ancient history now, and there can be no use in reopening the matter. Irish silks and poplins are not made in any low grades, therefore they cannot, and do not try to, compete with low-priced and low-classed goods from elsewhere. There are two sides to every question, and to the question of buying and using Irish goods of this description our side is—Can the purchaser afford to buy them? A first-class article is in the end cheaper than a "cheap" second-class one; but where the purchaser is not in a position to pay the price of a first-class thing, the purchase is out of the question. A man with only £1 in his pocket cannot buy a £4 4s. suit of Irish tweeds. He wants a suit of clothes, and has to do the best he can with the money at his disposal. This fact must be recognised; but where the money difficulty does not come in, or where Irish articles are obtainable at prices to suit the purchaser, I hope that some effort will be made by the general public to patronise them.

LURGAN.—The linen cambric handkerchief trade is still very dull; the past month, however, is always about one of the dullest in the year. It is confidently expected that September will bring increased business and life into all departments. A good deal of cambric for hemstitching has been made lately, but the production of hand-loom goods all round is down to the lowest point yet reached. Hand-loom linen handkerchiefs (of boiled yarns) are about as slow as can be. Power-loom manufacturers keep still busy, but new business is scarce, and some of the factories which were engaged making nothing but linen cambric are turning unto linen goods. The output from hand-loom is now extremely small, owing to hay harvest and scarcity of employment. Bird-eye diapers, damasks, and cambrics are in increased demand, and some cambric workers are starting to the former. Machine hemstitchers are not quite as busy as they would wish to be.

English.

BARNSELEY.—The linen trade of this district has during the past month been fairly steady, with the exception of the various kinds of drills, makers of which have not their looms fully employed. In table linens there has been a much better feeling recently, the demand having improved slightly. New designs which are being put upon the markets are meeting with more favour than for some time past, and for the home trade the demand seems likely to be fairly good. In carpet, stair, and such-like coverings the demand has ruled equal to production, and for export account more than an average business is taking place. In plain, fancy, and bordered towels a good number of orders have been booked, and especially in the finer qualities of goods has this been the case. Roller towellings have had numerous inquiries, with a steady demand. Domestic cloths generally keep selling as they are produced, without much stock remaining on hand. Taken as a whole, the prices of various classes of goods are fair, although complaints from manufacturers are freely expressed that competition, both amongst themselves and from abroad, is very keen, and that there seems but slight hope of much improvement in this respect in the early future.

LEEDS.—Business generally in this district has been fairly active, and, with slight exceptions, manufacturers of the various classes of goods keep fully employed, whilst in the Guiseley and Yeadon districts many mills are working overtime—a few day and night—producing the cheaper kinds of mantlings and such-like goods adapted for ladies' wear. The higher classes of worsteds are still meeting with favour, whilst in other descriptions a moderate business has been done. Serges are having a

good demand, and are being produced in large quantities in both plain and fancy styles, the latter meeting with most favour. Tweeds, chevots, and such-like cloths have sold fairly well in the lower and medium classes, and for the finer kinds in good design and colouring the demand has improved. Goods specially made for the ready-made clothing trade have sold rather better recently, but the general quietness in other trades has had a great effect upon this branch of the woollen trade; still, hopes are entertained that a better demand will arise shortly, as the inquiries for new contracts have recently been rather numerous, and already much stock has been cleared off.

BRADFORD.—In wools, as regards both demand and prices, there is little change to note. The consumption of the raw material does not keep staplers busy, as it is only of a hand-to-mouth character; and as two large firms have during the month had meetings of their creditors, a rather uneasy feeling was prevalent for a few days, but this did not affect prices in a quotable degree, as these have, on the whole, kept fairly firm during the month. In the country, farmers generally demand full rates for any wools they have to sell, and this fact makes the stapler in turn hold his wool firmly. In regard to the yarn trade, a rather quieter feeling has prevailed, and where merchants have offered orders, they have generally tried to get some concession in prices, but, as a rule, without much effect, as spinners could get little out of the prices offered, and unless in want of work, orders of this class have been refused. In the Botany branches, business has been slightly better than for some time past, but the orders are generally small and at low rates. The piece trade has a quieter aspect in nearly all branches, and orders are with difficulty secured, even at lower rates.

MANCHESTER.—Since my last report was published, the home trade has not been marked by any features which can be regarded as indicative of substantial improvement. The large dividend (8 per cent.) paid by Messrs. Rylands & Sons, Limited, points to the existence of a prosperity which has not, from all accounts, been general during the past half-year. As far as agents for Belfast houses are concerned, there is certainly a good deal of complaining to be heard, and, after allowing for the usual amount of exaggeration of which some people are guilty in relating their woes, it may be taken for granted that there is some truth in it all. I believe that agents have had to work a good deal harder of late to please themselves and their principals. The ordinary requirements, of course, have had to be met, and a fairly steady demand has prevailed even where grumblers have grumbled their loudest. But there has not been anything like robust activity in the market, and it is this, coupled with adverse reports concerning other trades, that has depressed the linen men.

The Cotton Trade Crisis.

The contemplated action of the United Cotton Spinners' Association has also had an injurious effect. The final decision of the masters may possibly be known by the time these lines are in print. At the time of writing, however, the Association is endeavouring to test more thoroughly the feeling of the trade as to the proposed ten per cent. reduction of wages and running of short time. Many firms who do not belong to the spinners' organisation would be willing to co-operate with it. It would be difficult here to enter fully into the reasons which actuated the majority of Lancashire and Cheshire employers in raising the important question now before the trade. Briefly, however, it may be stated that, while competition has been increasing, consequent upon the erection of new mills at home and the partial closing of the great Eastern market, and while profits have been declining, expenses have not been reduced in proportion. The cotton operatives have had to make no sacrifices, although their employers have for years found the struggle for commercial existence increasingly difficult. To-day the former rank as the most highly paid class of textile workers in Europe. Women and girls in a Lancashire cotton mill earn more money than men weavers in the silk trade, where the average wages (I am speaking of Macclesfield) have not for some time exceeded 10s. to 11s. per week. I know cases where young women of 20 or 21 in a silk mill do not make 7s. a-week, while in the sewing cotton trade women earn twice as much. A bobbin polisher, who is a lad, can in Lancashire make as much money as a Macclesfield silk weaver who has been at the trade all his life. The earnings of some families in such towns as Burnley, Nelson, or Oldham exceed those of many a professional man; and it is a very common thing in some parts of Lancashire for cotton operatives to own the houses they live in, and occasionally others besides. I have a case in mind where a mill hand is the possessor of a whole street of houses. In addition to the advantages thus enjoyed, the textile workers of the country have the benefit of food which is much cheaper than that which their fathers had to buy in the old days of lower wages. Their organisations are the strongest of the kind in the world; their leaders are men of ability, with as much knowledge of the trade as the employers; and their press organs are numerous and influential. The masters now think that it is time their operatives made a small sacrifice for the good of the trade; and I venture to prophesy that the question raised during the past few weeks will not be allowed to drop without a result of some kind. If the men, confident in their own strength and the sagacity of their leaders, insist on striking rather than accept the proposals of the masters, the outcome will in any case be a reduction of the union funds—possibly an entire shrinking away of them. But it is not yet certain what course the masters will take, although there is a growing feeling in the

trade that wages are too high, in view of the unremunerative character of the industry. Had it not been for the adoption of the limited liability principle in Oldham, the spinning trade would not be able to maintain the position it occupies to-day.

The silk trade is passing through a crisis of a serious character. It many years since Macclesfield was so depressed, and hundreds of weavers are walking the streets. Leek is a little better off, owing to the special character of the trade there.

The plush trade is in a deplorable condition, of which the "passing of Lester's dividend is one of the results. There is a slight improvement in some branches of the Yorkshire trade, but the general condition of affairs is not satisfactory. All this adversely affects warehouse travellers, and accounts for the want of elasticity in the home demand for line referred to above.

LONDON.—We are just now passing through the usual quiet season which may be said to commence about the middle of July and runs on to the middle of September. We are, however, this year exceptionally quiet, so far as city and suburban business is concerned; but a great briskness is shown throughout the provincial centres than was anticipated. Travellers report hopefully; the country is in a good state in most of the agricultural districts, but would be improved by a few days' soft rain. The seaside trade of July is behind previous years, and I understand this is in measure accounted for by the intervening election, which kept thousands of the July visitors at home. The local retailers at the many English holiday resorts are therefore complaining, and it is feared that many who bought in anticipation of a good season's trade will have heavy stocks left on their hands, unless August and September are exceptionally good. In the city business is extremely dull, and the number of houses in the fancy trades which are unfortunately financially embarrassed, is evidence of how far the events of the earlier part of the present year affected the smaller wholesale houses, who exist in a great measure upon credit. Continental manufacturers have suffered intensely. Every list of creditors which one takes up discloses that the indebtedness is to a great extent abroad, and before the present year terminates, it is to be feared that we shall have a greater number of stoppages than was expected. In the midst of so much of the depressing commercial element it is refreshing to take up the report of the great firm of Rylands & Sons, Ltd., which shows a surplus of £82,259 4s. 1d. for the half-year ending 30th June 1892, and out of this it is proposed to declare a dividend at the rate of 8 per cent. per annum, free of income tax. This will leave £22,259 4s. 1d. to be carried to the credit of the reserve fund, which will then stand £457,964 8s. 6d., figures rapidly approaching a reserve of half-a-million. The surplus of £82,259 4s. 1d. already referred to is not beaten by any dry goods company in the world, though the H. B. Claffin Co. of New York comes perhaps next. Taking all the concerns of the Messrs. Rylands together, we find that the company gives direct employment upwards of 11,000 persons, which, perhaps, with a few exceptions outside of the dry goods trade, is the largest number of hands employed by any company in this country. Messrs. John Howell & Co., Ltd., have declared a dividend at the rate of 10 per cent. per annum, free of income tax, a dividend which I believe the company has regularly declared since its incorporation in 1871. In the export trade business still remains about as quiet as it can be. An advice which reached London a few days ago from Melbourne, states that the banks, owing to the insecurity which followed the recent financial disaster, were closely restricting advances, rumours of failures were frequent, and the position had become painfully strained. The depression is described as being very severe, and trade had been growing worse throughout June. In the drapery trade, particular goods were being sold without reference to cost, by many firms, in a way which was significant of a necessity to realise at all hazards. Wages were being reduced, and short time introduced all round. The news, however, that a loan of £2,000,000 was being negotiated for the London market for the Australian colonies has somewhat brightened the commercial horizon; still, the outlook for the Australian export trade is gloomy. From Queensland a much similar report has reached London. The great fire at St. John's has already done something to stimulate the export trade, and a few good lines have been placed. We had a fair number of retail Canadian buyers in the market since the beginning of the present month, but their purchases have been made very carefully. When writing in your last month's issue, my reference to the land-boom speculation in Australia was made to read, through no doubt, a printer's error, "hand-loom speculation." Turning to Milk Street: business still remains quiet, and not much improvement is expected till the close of the present month, when the hard-worked agents in the linen trade will have completed their usual leave of absence. What is being done now is of a small character, as the replenishment of the warehouse stocks is in a measure over. The total sales of any one in Milk Street during this part of the season would not be a large figure, but it is not for want of pushing. I have often said before that there are no agents in London who keep so incessantly plodding along as the Ulster men in Milk Street Plantation. One of these gentlemen, representing the linen agencies of importance, tells me that he has met with a great temporary in the linen trade who could say that returns for the half-year are what he expected they would be; still the general feeling is that the second half of the year upon which we have entered will not wind up so badly. It may interest your readers to know

that the Middlesex County Council has decided to spend this year a large sum of money upon technical education; £7,000 has already been allotted for the purpose, and will go towards the foundation of scholarships and the payment of lecturers. It is the intention of the Council to largely increase the grant year by year.

Continental.

BIELEFELD, 9th August.—*Yarns*—A good business has been done during the past month both in lines and tows, taking into consideration the time of year. Spinners are well supplied with contracts, prices are very firm, and tendency is to take an upward movement at a change. Stocks are in small compass. *Linens*—The amount of business has been, as a rule, of a limited extent during July, but notwithstanding, satisfactory for this time of the year. Stocks are small, especially in the finer goods used for fronting and shirting linens, cuffs and collars, and manufacturers expect a good business, the more so as the prospect of a good harvest will have a beneficial influence in the development of trade. Prices are very firm, with an upward tendency for the finer sets of cloths; power-looms are in full activity.

LANDESHUT, 9th August.—The Yarn Exchange on the 4th inst. was attended only by few members. Most of the spinners are under contract for such a long time that they stay away from the Exchange. Prices for tow yarns maintain a steady hold, and for line yarns still higher prices are demanded, which spinners ultimately will get, owing to the raw material keeping at a very high price. Some large contracts for later delivery were entered. *Linens*—Power-looms are still fairly occupied, and manufacturers have orders on hand. As usual about this time of the year, the production of hand-looms is small. Next Exchange will be on 7th September.

BRUSSELS, 9th August.—*Flax*—The 1892 crop in Belgium, France, and Holland is likely to turn out the smallest we have had for many years, the short sowing and dry season having both contributed to this result. However, it is generally recognised that the straw, with the exception of that from a few districts, is the best we have had for many years, and, considering the season, has been exceptionally good for steeping purposes. It is expected that a considerable quantity of this year's crop will come on the market, as Courtraï flax, from November till next spring, thus conferring a boon on many spinners who are badly in want of fine material; at the same time, it is more than probable we may hear of very long prices for this fine material, as the straw has been sold at prices that have not been heard of for many years past—£32 per acre for green flax on foot. *Yarns*—Since the heavy shipments made to Italy and Spain before the end of June, demand has been much quieter, and, if anything, prices have been a shade easier for common lines 20/100. *Linens*—Up to the present, 1892 has not proved a golden year for manufacturers; but should the present harvest, which, as a rule, is exceptionally good, be properly saved, we should see better trade during the next few months than we have seen for many months past.

to power; and these in turn will assert that *their* success alone can repair the mischief already occasioned, and avert the greater mischiefs ready to follow. One side will maintain that the M'Kinley tariff has been a blight upon the industry of the country, while the other will as strenuously insist that its repeal will have the same evil effect. Happily the silver question is settled; and the defeat of "free silver" was a relief to the mercantile community. As not one man in ten thousand, even here in our own land, knows what is meant by "free silver," I submit a broad definition:—Free silver means that owners of silver bullion shall have the right to take it in unlimited quantities to the Mint and have it coined into dollars free of charge. Government at present buys silver at the market price, and coins it on its own account into dollars worth, *as bullion*, seventy cents or thereabouts, *but as coins*, one hundred cents. Under free coinage the coined silver dollar would drop to its bullion value, and the prices of merchandise would rise proportionately. This is out of the calculation now. And matters commercial seem to be in flourishing condition: one thousand failures less during the first six months of '92 than during same period of '91, and forty millions of dollars less of liabilities. New industrial enterprises for manufacturing iron, cotton, and woollen fabrics are going on in various sections; and, while the margin of profit is small, business is on a solid foundation, money is abundant, crops look promising, and collections are easy.

Ulster received a good turn at our hands last week. The Pullman Car Company—railway carriages, sleepers, dining cars, etc.—placed their contract with Marshall Field & Co., of Chicago, for bedding linen and wash-room supplies. This will be executed by the Gribbons, and the value thereof is £60,000. Germany got a small piece of the plum, £20,000. Not so small, either. Contract for table napery not yet placed. All this is for 1893, the Chicago Fair year. Marshall Field is a director in the Pullman Co. *Propos* of napery, a new house here in table damasks is stirring matters up for the old, conservative houses. It is selling cloths, napkins, and piece damasks at 25 per cent., and more, less than standard figures—which goes towards showing what a mint there must be in Jacquard "effects."

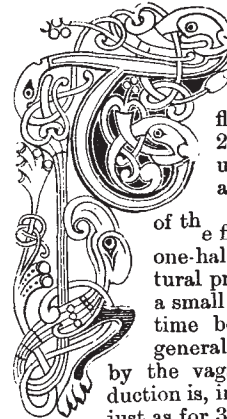
Franklin Street is enjoying a siesta to-day. Thermometer shows 96° in the shade, and business is practically suspended. This is the fifth of a series of "roasters," and the strongest men feel the effects of the heat. Out-of-town buyers retreated to the seaside when the heat began to manifest itself; and as home buyers are on their vacations, or not wandering about in search of goods, the week has been one of enforced idleness.

$\frac{3}{4}$ Linens remain as at last writing. Some new contracts were placed last week for delivery between now and January 1st. Prices are firm, and stocks only in fair supply. Unions are receiving considerable attention; they are sold in collars and cuffs as linen. Belfast wouldn't do *that*. Linen cambric handkerchiefs are not on the improving side—not for ladies' wear, at any rate. Cotton is giving linen a severe tussle.

Glass & O'Flaherty have transferred their handkerchief account from Shuler-Shultz & Co. to Barker, Ash & Waters.

Flax Production in the United States.

EXTRACT FROM REPORT BY JOHN HYDE, SPECIAL AGENT, AGRICULTURAL DEPARTMENT, U.S.A.



THE total area of land devoted to the cultivation of flax in the United States in 1889 was 1,318,698 acres, or 2,060.47 square miles, the production of flaxseed 10,250,410 bushels, the production of fibre 241,389 pounds, the amount of flax straw sold or so utilised as to have a determinable value 207,757 tons, and the total value of all flax products \$10,436,228.

Although there has been no period when the value of the flax products of the United States has amounted to one-half of one per cent. of the total value of the agricultural products of the country, there has never been wanting a small cluster of states in which flax culture was for the time being a matter of considerable importance, while general interest in such culture has always been kept alive by the vagaries of its geographical distribution. Flax production is, in fact, one of the curiosities of American agriculture, just as for 3,400 years of authentic history it has been one of the most interesting features of the agriculture of the old world.

The census of 1860 dealt with a flaxseed production slightly in excess of that reported at the preceding census, but the production of fibre showed a falling off of 38.78 per cent. Three of the greatest flax-growing states of to-day, Minnesota, Kansas, and Nebraska, appear in the list for the first time, with a total of 131 bushels of flaxseed and 3,118 pounds of fibre. Of the total fibre production of the country, 50.86 per cent. was credited to New York and Ohio, while Ohio and Indiana produced 63.83 per cent. of the total amount of seed. Kentucky had fallen to the third place in the production of fibre, but the amount produced in that state was more than three times the present production of the entire country, although it formed but one-seventh of that of the period under consideration.

The close of the next decade witnessed the high-water mark of fibre production in the United States, the production of 1869 being to that of

United States Market.

(From our Special Correspondent.)

NEW YORK, July 29th, 1892.



THAT the general linen business is insufferably dull and disappointing is admitted on all sides. And yet linen importations to the United States are showing increased volume, and the consumption of linen goods goes on as ever. But we of the New York market are prone to imagine it to be the only supply station for distributing the Irish textile through the length and breadth of the land. The fact is that an enormous number of linen packages go direct from steamers discharging cargo at this port to Chicago, and from thence are distributed to customers who formerly purchased from New York travellers or came East to do their buying. That is why the linen importers of Franklin Street tell us that demand from the West is only fair,—and that section of our country never so prosperous as it is to-day. The South is again a poor customer. The low price of cotton and the disastrous floods have told heavily upon her merchants throughout many portions, and, while they are compelled to buy cotton manufactures of all kinds, they touch linen goods lightly or not at all.

So it would seem to the New York mind that Irish linens are not in the rush of demand that permeates nearly every branch of merchandise handled by importer and jobber, for we have experienced an unusually good year's trading thus far in both exports and imports. But New York does not enjoy the monopoly of linen goods interests she once did. Chicago is hitting her as hard in that field as she did fifteen years ago, and over, in the jobbing dry-goods field. And the results are strongly apparent.

Presidential year has come round again, but its old bug-a-boo quality as a disturber of business interests seems to have departed. The disturbance will be chiefly on paper. Partisans of the administration will contend that ruin and disaster will follow the advent of their opponents

1889 as 112 to 1. While this country has never yet been able to compete with foreign nations in the production on a commercial scale of the finer grades of flax, such as the Courtraï and best Dutch, and no less an authority than Mr. Charles Richards Dodge seems to doubt whether it ever will, at least so long as the preparation of the fibre requires such an expenditure of labour, care, and patience as the peasantry of Europe now bestow upon it, it enjoyed for some considerable time a fibre industry of no small importance. The manufacture of flax bagging, suddenly put an end to by the abolition of the import duty on jute butts, had doubled the acreage in flax within 3 years. During that period, 1866 to 1869, the proportion of the cotton crop baled with flax bagging increased from three-sixteenths to three-fourths, and the baling of the crop of 1870-1871, consisting of 4,347,006 bales, taxed to its utmost the capacity of every bagging mill in the country. Of the 27,133,034 pounds of fibre reported at the census of 1870 as the production of the previous year, no less than 17,880,624 pounds, or 65.90 per cent., was produced in Ohio. New York and Illinois ranked second and third, respectively, with a combined fibre production of not quite 6,000,000 pounds. In seed production Indiana again held the second place, Ohio leading, and Illinois standing third, the aggregate production of the three states being 75.93 per cent. of the entire crop, contributed to by 33 states and territories. At this census California is found in the list of flax-growing states for the first time.

While the work of the census enumerators has been carefully verified in all cases of doubt, it has not been found practicable so far to extend the investigation as to elicit any expression of opinion from western flax-growers in general as to the causes that have operated to change so completely the location of the principal flax-producing region. There is, however, no lack of testimony that, notwithstanding the results of chemical tests and the experience of European flax-growers, the farmers of Illinois and Indiana still cling to the idea that flax is necessarily an exhaustive crop, and the past decade having brought under cultivation what little raw land remained to be subdued in those states, flax culture has accordingly given way to other crops.

Concurrently with a greatly reduced acreage in these and other of the older states there has come an increased demand for flaxseed, which has commanded a price that has rendered it not unfrequently a more profitable crop than either corn or wheat, especially when raised upon the strong soils of the newer states west of the Mississippi river. Although flax is undoubtedly a favourite sod crop with the farmers of the north-west, that its cultivation has been resorted to to any great extent merely for the purpose of taming the soil is exceedingly unlikely, not only because soils similar to those on which flax is now raised produced magnificent crops of wheat and other cereals long before the cultivation of flax in those regions was ever thought of, but for the still more important reason that it is in the older counties, both of Minnesota and South Dakota, that the most remarkable development of flax culture has been witnessed.

Although the agricultural investigations of the eleventh census have been, as a whole, nearly two and one-half times as comprehensive statistically as those of any preceding census, such are the magnitude and diversity of the agricultural interests of the country that not a few branches of investigation have still had to be confined within comparatively narrow limits. Accordingly, no attempt has been made to ascertain the separate values of flaxseed, straw, and fibre, and the collective values will be found to vary not only with the variation in the prices of the individual products, but also according to the proportion borne by each of the three to the entire amount sold. In states where but little is realised from the sale of straw or fibre, there is a close correspondence between the production of flaxseed in bushels and the amount received by the producer in dollars, the average value of the seed being evidently a trifle under \$1 per bushel. It must not, however, be supposed that there was any decided approach toward uniformity in the price received for flaxseed. On the contrary, there appears to have been considerable variation, although there would scarcely be warrant for inferring its precise limits so long as it is impossible to determine the exact value of the straw which is included with the flaxseed in the report. Throughout the greater portion of the principal flax-producing region, however, flax straw is practically of no value, not being utilised even for tow or for paper making. Much of it is got rid of by burning, the small percentage that is turned to good account being used either for thatching purposes or as bedding for stock, although in some instances it is used for feed, a practice greatly to be deprecated.

In any comparison, however, either of the fibre production of different states or of that of the entire country at different periods, it is important to remember that but little of the so-called "fibre" produced in the United States within recent years has been fit for spinning, or has really been entitled to the designation that for convenience has been given to it in census and other statistical reports. While flaxseed is a well-defined product, subject only to the same quantitative and qualitative variations as agricultural products in general, flax fibre as known to the American farmer and manufacturer has not always had a like uniformity of meaning. Indeed, the utilisation of the fibrous portion of the flax plant has varied so widely at different periods that any comparison of "fibre" production based solely upon statistical reports is liable to be misleading. The "fibre" reported at the various censuses up to and including that of 1860 was an excellent grade of scutched flax, fit for spinning, and able to hold its own against all but the finest imported varieties. The "fibre" reported at the census of 1870, which was raised to meet the enormous demand for bagging, was, on the other hand, only a very common quality

of "tow," abounding in woody refuse, and so carelessly prepared as doubtless in some measure to have led the way for that adverse legislation which practically put an end to its production. The "fibre" of the present day is likewise, with few exceptions, only a coarse by-product used mainly as upholstery tow. As a result, however, of the well-directed efforts of the Department of Agriculture, there are indications of the revival in the United States of a genuine flax industry that should ultimately render the American people, the largest consumers of linen in the world, entirely independent of the foreign manufacturer.

[A very optimistic view, after such a report and the opinion expressed by Mr. Dodge.—Ed.]



An English Provincial Technical School.

BY J. WERTHEIMER, HEAD MASTER OF THE MERCHANT VENTURERS' SCHOOL, BRISTOL.
(Condensed.)



HOSE interested in technical education may be glad to have some details of an attempt that has been made in Bristol to establish a Technical School, which should possess the best features of similar schools on the Continent, and yet be adapted to special British and local requirements. It was with this end in view that the Society of Merchant Venturers erected the school which bears its name, and which was opened in September, 1885.

The Society of Merchant Venturers of the City of Bristol is the only survivor of many local trade guilds, and still retains its ancient hall as corporate property. In 1880 it decided to devote a considerable amount of its corporate funds to the erection and maintenance of a Technical School, which should be worthy of the educational traditions of Bristol and of the ancient society itself. The Bristol Trade School, with its staff was taken as the nucleus of the new school, and the site formerly occupied by the Bristol Grammar School was chosen for the erection of a new building.

The erection of the buildings and the purchase of the fittings and apparatus involved an outlay of £45,000. For this sum buildings have been provided which in themselves constitute an object lesson in construction, every part being built in a solid and serviceable manner. No beauty is overlooked; the main staircase is of marble throughout, while the woodwork is of the best pitch pine, except in the great hall, which has a carved oak ceiling, as well as artistic oak panelling. The school contains a great hall for popular lectures, examinations, etc., to accommodate 900, nine ordinary class rooms, a large chemical lecture theatre (for 108 students at a time), a smaller chemical theatre, a physical lecture theatre (for 108), an engineering lecture room (for 56), an engineering drawing office (for 48 at a time), two chemical laboratories (for 50 at a time), a balance room, combustion room, gas analysis room, physical, metallurgical and biological laboratories, boot and shoe workshop, metal workshop, carpenters' workshop, forge, plumbers' workshop, two art rooms, dressmaking and millinery room, library, engine-house, etc. Each department is fitted out with the latest appliances for teaching and for practical work.

There are three distinct branches of the Institution; (a) the Boys' School; (b) the Upper Technical School; (c) the Evening School.

(a) The Boys' School is itself subdivided into a Lower and a Middle School. In the Lower School boys from 9 to 13 receive teaching in ordinary English subjects, and also in the rudiments of foreign languages, art drawing, and natural science. It is not intended to continue this part of the work, but to abandon it gradually as the present accommodation for higher work becomes more and more inadequate to meet the demand. The Middle School (for boys from 12 to 16) has two sides, a commercial side and an applied science side. The course of instruction will be readily understood by a reference to the published tables.

The fees in the Boys' School vary from £5 to £6 10s. a-year. (b) The Upper (Technical) School is for day students over 15 years of age, and women students are admitted to all departments on the same terms as men. It is divided into the following sections:—Mechanics, engineering, electrical engineering, chemical and metallurgical, applied art and building trades. There is also a special "University" section for students preparing for the degree of B.Sc. of the University of London. Twenty-six per cent. of the present students are women. The inclusive fee for the Upper School is £10 10s. a-year. The ages of the students vary from 15 to 62, the average age being 18.

(c) The Evening School is intended mainly for artisan and commercial students of either sex. Its classes are divided into the following departments:—

- i. Science, including mathematics, theoretical mechanics, applied mechanics, steam, building construction and drawing, machine construction and drawing, navigation, theoretical and practical chemistry (organic and inorganic), metallurgy (theoretical and practical), sound, light, heat, magnetism, electricity, practical plane and solid geometry, hygiene, botany, and zoology.
- ii. Art, including drawing, painting, modelling in clay, wood-carving, designing, etc.

- iii. Technology, including boot and shoe manufacture, carpentry and joinery, plumbing, metal working, photography, dressmaking, millinery, electric lighting, mechanical engineering, and telegraphy.
- iv. Commerce, including French, German, Spanish, commercial arithmetic and geography, book-keeping, and shorthand.
- v. Classes in preparation for the examinations of London University.
- vi. Ambulance and nursing lectures are given, as well as an annual series of popular penny lectures.

There are 48 teachers, of whom 12 are graduates. Number of students on roll, 1,444, against 1,082 in 1890.

It will be readily understood that the school is not self-supporting. In recent years the excess of expenditure over income has amounted to about £1,900 a year, and this sum therefore represents the annual cost of the school to the Society of Merchant Venturers.

What are the results of the training which the school offers? Perhaps they may best be gauged by the fact that there is a larger demand for the pupils of the upper part of the school than it is possible to supply. Most of the leading manufacturers and merchants of Bristol recruit their staff from pupils of the school. Further proof of the popularity of such an education as the school offers is to be found in the fact that it draws students from Staffordshire, Warwickshire, London, South Africa, Portugal, and other points at a distance, as well as from the West of England and South Wales.

For some time the French Ministry of Public Instruction has sent to the commercial department of the school two young Frenchmen annually. They arrive with a fair knowledge of English, but they are, as a rule, unable to speak the language. Soon, however, they become fluent, and at the end of two or three terms they enter merchants' offices as "volunteers." They afterwards return to France with a knowledge of our markets and mercantile habits that must make them a valuable acquisition to French commercial life. Their travelling expenses, board, lodging, books, etc., are defrayed by the French Government, with the exception of students from certain large towns (Lille, Rouen, etc.), whose expenses are paid in part by the municipalities. In all, a dozen youths are thus sent away in each year, six to England and six to Germany or Switzerland: the average annual cost per school year (10 months) is for bursars in England £64, and for German or Swiss bursars £48. This expenditure is in addition to the sums spent annually in sending 15 teachers of the *École Normale* to foreign countries. What a lesson for us in England! Let us hope that we may soon be able to send each year at least a dozen boys to study French and German commerce on the spot.

Book Notices.

The Cotton Mill: a reference manual for Millowners, Managers, Engineers, Spinners, and Manufacturers; comprising data on Hydrostatics, Calorics, Dynamics, Mechanics, Physics, and Electrics, as applied to Cotton Mill Engineering, with upwards of forty large electro blocks of modern spinning and weaving machinery. By Charles W. Lancaster, C.E. London: Lancaster & Co., 4, St. Mary's Axe, E.C., and 35, Market Street, Manchester. Size, Royal 4to.—A glance at the table of contents shows the comprehensive kind of work this is, and the matter it contains is carefully edited and in a compact form for ready reference. As an expert of large experience, the author has supplied a vast amount of technical information in as simple a form as possible, so as to be of practical value to all engaged in mill work. To give an idea of the nature of the work, a brief sketch of the contents will show the range of subjects treated. Heat, air, water, steam, and fuels are each technically described; then follows notes on boiler appointments, mechanical stokers, fuel economisers, and the sundry adjuncts of steam; rope and belt driving, shafting, table of power for spinning and weaving machinery, &c. The second part treats of cotton mill construction and fitting up, with estimates for working. Besides the foregoing, there is a great deal of useful information for mill managers and engineers in connection with machinery and tools, &c., and a number of recipes are supplied. The work is beautifully got up, and the illustrations of mill machinery, &c., superb. It should find a place in the mill and factory library of every well-ordered establishment.

Everybody's Pocket Cyclopædia. By Don Lemon. London: Saxon & Company, 23, Bouverie Street. Cloth 6d., leather 1/-. The demand for these extremely handy books is enormous. The issue now of this particular one is the 510th thousand. It is a marvellous little work, dealing with an infinite variety of subjects "boiled down and served up" in the most useful form, and furnished with a comprehensive index for quick reference.

LINEN DYE RECIPE.—For ninety pieces of ordinary linen goods in black.—Enter into a warm bath at 60°C. or 140°Fah., containing 9.5 lbs. cutch, 6.5 lbs. dry logwood extract, 3.25 lbs. copper sulphate. Work for half-an-hour, then enter in a boiling bath of 3.25 lbs. of bichromate of potash for one hour, next dye with 20 lbs. logwood and 1.5 ozs. soda, sadden with 1 lb. 10 ozs. of copperas, wash, soap, and then wash dry. Aniline Black.—Work the cloth in a bath of 10° Twad (strength containing 1,000 parts of aniline salts), 600 parts chlorate of potash, 100 parts copper sulphate, for a time at a temperature of 112 or 114°Fah.; age at 140°Fah. in ageing room, then run through a bath of bichromate of

potash at the heat which the hand may bear; finally wash in soda, and dry: if this recipe is properly followed out, a good non-rubbing-off black will result.

COMPARATIVE TEMPERATURES.—When temperatures are reported and no mention made of scale, it may generally be known by bearing in mind the scale used in the country from which the report comes—Reaumur's scale in Russia; Fahrenheit's, for ordinary purposes, Great Britain; Centigrade, all other parts of Europe and America. 9°F.=5°C. or 4°R. The temperature of one scale may be found in another by this simple rule: divide by its own number and multiply by the one it is going to. In leaving F. subtract 32°, but in going to F. add 32°; for instance, 80°C. what is the scale in F.? $80 \div 5 = 16 \times 9 = 144 + 32 = 176^\circ \text{Fah.}$



Chemicals and Dyes.

(Special Report by Messrs. SADLER & Co., Ltd., Middlesbrough.)

THE chemical trade generally is dull and uninteresting. Alkali makers complain of increasing stocks and a scarcity of specifications. Caustic Soda is weaker, but there is no relapse in the value of Soda Ashes. Ammonia products are difficult of sale, and the improvement which is expected to come with the spring has, so far, not shown itself. Sulphate of Ammonia is being sold at £9 15s. to £10 per ton. Liquor Ammonia, Carbonate Ammonia, and Sal Ammoniac are all quoted at lower rates. There is an absolute collapse in the value of Tar products, and Tar, which at this time last year was quoted at 35/- per ton, is to-day valued at 10/-. Distillers will have lost heavily on their engagements during the past year. Carbolic Acid is looking up a little, the demand for sanitation purposes having very much improved. There are no stocks, and this article is likely to see better prices. Dyes and Dyers' Chemicals are all slack, and in poor demand. Aniline Oil and Alizarine, the two staple colours, are lower now than they have ever been known to be before, being quoted at 6½d. and 8½d. respectively. The higher prices asked for Bichromates stopped business for some time. Buyers now, however, have accepted the inevitable, and the market has resumed its usual state, and a considerable business is being done at the new prices. Oxalic Acid is still quoted at 3d. nett, and important business is being done at this price. The various Potash Salts retain their firmness, whilst Nitrate of Soda is weaker.



Selected List of Applications for Patents relating to Textile Fabrics.

Compiled from the Official Records, by Messrs. W. P. THOMPSON & Co., Patent Agents, of 6, Bank Street, Manchester; 6, Lord Street, Liverpool; and 323, High Holborn, London, W.C.

W. P. THOMPSON & Co., 6, Bank Street, Manchester, Liverpool and London (communicated by P. Bévenot, Belgium), No. 11,901.—"Improvements in or relating to apparatus used in the manufacture of cotton yarn." 25th June, 1892.

J. AINSWORTH, Bradford, No. 12,279.—"Improvements in apparatus employed in spinning, doubling, and twisting fibrous substances." 2nd July, 1892.

G. E. DONISTHORPE and T. BURROWS, London, No. 12,513.—"Improvements in machines or apparatus for breaking, decorticating, and scutching flax, rhea (China grass), and similar fibres." 6th July, 1892.

S. H. BROOKS, R. A. DOXEY, and J. S. BROOKS, Manchester, No. 12,677.—"Improvements in machines for winding yarn into spools or bobbins." 9th July, 1892.

W. YOUNG, Halifax, No. 12,862.—"Improvements in drawing rollers of wet spinning frames for flax and jute." 13th July, 1892.

M. M. GREEVES and T. LUCAS, Belfast, No. 13,041.—"Improvements in stop-motions for machines used in preparing flax and other fibres for spinning." 15th July, 1892.

PATENTS COMPLETED.

The specifications of the following patents have been printed and published during the month, and copies thereof may now be obtained at the uniform price of 9d., which includes postage.

1891.

GEORGE L. P. EYRE, Bedford Row, Middlesex, No. 10,134.—"Improvements in apparatus for treating and scouring or cleansing wool and other materials, for removing therefrom greasy or other matters, and for analogous cleansing and separating operations." 15th June.

J. CAMPBELL and F. T. GREENWOOD, both of Manchester, No. 22,273.—"Improvements in expanding pulleys for roving frames, and other machines."

1892.

CARL BACK, Vienna, No. 8,379.—"A process and apparatus for winding or spooling thread."

AUSTRIAN APPLICATIONS.

JOHANN NARRETH.—"Scutching machine applicable for flax and hemp, 10th September, 1891, also a machine for simultaneously breaking and smoothing hemp and flax." 18th September, 1891.

JULIUS E. DANNENBERG.—"Shuttle protector which, when the loom is no longer in action, raises itself automatically." 22nd January, 1892.

GUSTAV ULBRICH and HERMANN ULBRICH.—"Improved combing machine." 26th March, 1892.