phere; and that at one-third surpassed the vacuum. In fact, the bubble with its contents was more magnetic in proportion to the oxygen it contained. On the other hand, nitrogen showed no difference of this kind; whether a bubble contained that gas more or less condensed, its power was the same. Other gases (excepting olefiant and cyanogen) seemed in this first rough apparatus to be in the same condition.

Hence the author decides upon the place for zero, and concludes that simple space presents that case. When matter is added to space it carries its own property with it there, adding either magnetic or diamagnetic force to the space so occupied in proportion to the quantity of matter employed; and now thinking that the point of zero is well determined, he concludes to use the word magnetic as a general term, and distiguish the two classes of magnetic bodies into paramagnetic and diamagnetic substances.

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*The Flax Manufacture.—Steeping Superseded, and the Fibre adapted to Cotton Spinning Machinery.**

One of the greatest obstacles which has hitherto stood in the way of an extended cultivation of flax, viz., that of the trouble, delay, and expense attendant upon its steeping, in order to prepare it for the market, has now been removed, by an invention which entirely dispenses with that process, and enables the grower at the smallest possible cost to send his fibre into the market. By this process, of which Mr. Donlan is the inventor, the results are obtained by a combination of chemical and mechanical means, and as it avoids all the expenses connected with steeping, the fibre may be prepared at a cost considerably below that incurred in the present process, and may be made, we are assured, applicable either for fabrics of the coarseness of nail bags or canvas, or of the fineness of the most beautiful Brussels lace. But not only is the expense considerably less, but the time consumed in the preparation of the fibre, which, by the old process, ranges from ten days to three weeks, does not exceed as many hours by the unsteeped mode. It also possesses a vast superiority on account of the extreme simplicity of the means adopted, which may be made intelligible to, and performed by, a mere child. But by far the most important and valuable part of this invention is, that it produces a fibre perfectly clean, and in its natural state, without any of the stains or impurities which necessarily attach themselves to the fibre during the process of steeping, and it also possesses the advantage of securing that regularity and uniformity of strength which to a greater or less extent is wanting in the steeped fibre. Application has been made for a charter of incorporation for a company which will be prepared to purchase the flax produced upon 100,000 acres in Ireland, at 12*l.* per acre, and to prepare it for the market in cases where the grower may not possess the necessary facilities for preparing it himself.

The uniformity of strength and freedom from stain or impurity which exists in the flax prepared by the unsteeped process, has, within the last four days, led to the practical demonstration of an invention, of the value

* From the London Mechanic's Magazine, for November, 1850.

and importance of which, to the agriculturists and manufacturers of this country, it is impossible to form any adequate idea, and which consists, among other things, of the adaptation of the flax fibre to cotton machinery. The patentee of this invention is M. Le Chevalier P. Claussen, member of the Brazilian Institute, well known as the inventor of the circular loom, and by his collections of objects of natural history and plants of South America in the British Museum, and in the Museum at Paris. We had placed in our hands a quantity of flax rovings and yarns spun upon cotton machinery by the inventor, and we have had an opportunity of personally inspecting at Manchester the whole process connected with the invention, and the result has fully convinced us of its practicability. The finest portion of the yarn spun, in our opinion, and we were confirmed in it by a gentleman of great experience and long connexion with the cotton trade, was equal in fineness to 120's cotton, the coarsest being equal to 50's. The application of such a test as that of 120's for the first time was certainly a most severe one; the result, however, was perfectly successful. A slight difficulty arose at first with the machinery, in consequence of the length of the fibre; this, however, was easily obviated by a slight alteration in the position of one of the rollers. As the fibre, however, may be prepared to any length, there will be no necessity in future for even this alteration, the existing cotton machinery being perfectly adapted for the purpose of spinning flax prepared according to the process patented by M. Claussen.

The patent granted to M. Claussen for England, is for the preparation of flax in a short staple, so as to produce a substitute for wool and cotton capable of being spun upon cotton machinery, and also for the mixture of the materials thus obtained, which can be carded together with silk, cotton, or wool, or separately, as cotton for spinning into yarns. The right is also secured for preparing long fibre as a substitute for silk, for bleaching in the preparation of materials for spinning and felting, and also in yarns and felts. The inventor does not, however, confine himself to flax for the purpose of producing a fibre adapted to his purpose, but states that he can obtain similar results from hemp, jute, Chinese grass, and, to use his own expression, from "an old tar rope, or a bamboo cane."

As the patents are not yet secured for several continental states, we are not at liberty to state the nature of the process, or the means adopted for the purpose of bringing the fibre into the required state. We may state, however, that from $1\frac{1}{4}$ cwt. of the flax fibre prepared and cleaned upon the unsteeped process, 1 cwt. of a substance, identical with clean cotton, can be produced at a cost for material of less than half a crown. The cost of manual or mechanical labor required in its preparation, including the expense of bleaching, an operation performed in a few seconds, does not amount to more than seven-sixteenths of a penny per pound.

The mixture of the two substances, viz., wool with flax reduced to a short staple, forms a fabric exceedingly durable, while its cost may be judged by the fact, that while wool costs 4*s*. 6*d*., the flax prepared and ready for spinning may be obtained for 6*d*. per pound, so that with flax

and wool spun together in equal quantities, the cost would be reduced by nearly one-half.

But although the inventor has obtained a patent for the preparation of a fibre as a substitute for cotton, he does not indulge the visionary and impracticable idea of being able to drive cotton out of the markets, his object being simply to provide a substitute for low cottons, in the manufacture of a variety of fabrics in which that valuable and over-wrought material now forms a part. In a branch of our trade, however, for the supply of which upwards of 770,000,000 lbs. of cotton were last year imported, it is not too much to suppose that there exists ample room for the consumption of very large supplies of home-grown flax, while the facilities which are now found to exist for carding and spinning together flax and wool, must also tend to open up new sources of demand among the manufacturers of Leeds and Bradford.—*Morning Chronicle, Nov.* 14.

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*On the Consumption of Smoke from Furnaces and Chimnies—Abatement of the Smoke Nuisance.**

The Town Council of Manchester are pushing to a practical test their powers (under a local act) of compelling the manufacturers to consume the smoke of their furnaces. A report of the Council's sub-committee on the subject contains this very encouraging summary of their successes:

"In conclusion, your sub-committee congratulate the committee upon the fact, that, in many instances, chimnies which were at one time the worst in the borough, and which almost incessantly emitted dense smoke, are now amongst the best; and upon the still more important and significant fact, that your sub-committee have obtained the favorable opinion of mill-owners generally as to the practicability of preventing smoke at what are termed heavy mills, and that such prevention can be secured without loss. In several instances, parties who had most strongly expressed an opposite opinion, have with evident pleasure assured your sub-committee that they no longer entertain any doubt as to the practicability of preventing smoke, but also that such a happy change may be attained, if not with considerable economy, at any rate without loss."

Councillor Howarth added these interesting details—

"He lately waited on Mr. Hugh Beaver, and ascertained that the quantity of coal formerly used per week in his manufactory was 78 tons, whilst by the consumption of smoke and the improvement consequent on the adoption of the system, a weekly saving is effected of 28 tons. 'I visited Messrs. George Clarke & Sons' manufactory,' continued Mr. Howarth, 'and they told me the saving they effected by consuming the smoke from their fires was upwards of 40 tons per week. They formerly used 140 tons per week, now they consume less than 100 tons. They have expended upwards of 1200*l.* on new boilers to their steam-engines, in order to abate the smoke nuisance; and they expect the outlay will be repaid by the saving of coal effected in a year and a half.' "

The local correspondent of a London journal observes—

"No one who has visited this town recently, and who recollects the dense

*From the London Mechanic's Magazine, for November, 1850.