

SCIENCE AND ARTS.

It has been often remarked, that in science, as well as in art and mechanics, there is a rush for a time of discovery or of new applications of known principles, in one particular direction. This appears to be true at present of electro-magnetism, for scientific periodicals have been giving particulars of machines and apparatus by which this wonderful agent can be turned to account and made to work in ways never before thought of. We need not repeat here what we have mentioned before; but we must notice an application of electro-magnetism to manufacturing purposes which is now talked about, and which by many persons will, perhaps, be considered the most remarkable of all. Certain ingenious iron-smelters at Sheffield have contrived a plan by which they send a stream of magnetism thereby produced passes into the red-hot metal through an opening in the side of the furnace. Persons who have witnessed the operation say that the effect on the iron is to make it heave and bubble, while impurities are thrown off which are retained in iron made in the usual way.

This general description is all that, as yet, has been made public of this interesting subject, but further particulars may be expected shortly. Enough, however, is known to indicate that we are on the eve of important changes in the manufacture of iron, and of applications of magnetism in the mechanical arts of the most surprising nature.

In a paper published by the Meteorological Society, Mr. Bloxam proposes a theory to account for some of the phenomena of terrestrial magnetism,—namely, that they are occasioned by the difference in the hygrometric condition of different parts of the globe. Active evaporation, he explains, in one hemisphere, and active condensation in the opposite hemisphere, would each intensify the horizontal force. The southern hemisphere may be regarded as a region of evaporation, owing to the great extent of sea and small extent of land there; and the northern hemisphere must be relatively a region of condensation, owing to the great extent of land and small extent of sea there. In consequence of these relative conditions, heat will be conveyed from south to north; and the conditions being permanent, will account for the same end of the magnet always pointing towards the same pole of the earth. The more condensation converges northward, and the more evaporation converges southward, the greater will be the intensity of the horizontal magnetic force; but evaporation is perhaps much more influential in producing magnetism than condensation. We give this brief summary of Mr. Bloxam's theory, in order that it may be examined and criticised as widely as possible.

A method of ventilation has been tried in a large public establishment, the Almshouse, at Philadelphia, which deserves consideration, as it appears to have effectually accomplished the end proposed,—the complete removal of foul air. An opening is made at the level of the floor in the wall of a room or ward in the position usually occupied by the fireplace, at which heated air is made to flow in. Near this, also at the level of the floor, two other openings are made connected with a flew, to serve as outlets. The warm air on its entrance naturally rises but finding no escape at the sealing, it accumulates in the upper part of the room, and forces downwards the air which, having been longest in the room, is comparatively cool. This at length is compelled to escape by the two outlets

above mentioned, and thus there is a complete circulation and displacement of the whole mass of air in the room. Even in the most crowded wards, the air was so thoroughly freshened by this method, that not the slightest offensive odour could be detected; and an effectual check was given to the fever and cholera which had broken out in some parts of the building. The merit of this method appears to consist in a reversal of the usual practice, which is to place the outlets at the ceiling: if so much good can be effected by placing them at the floor, we should be glad to hear of a trial made in some large establishment in this country.

The making of wool from the foliage, if such it may be called, of fir-woods and pine-forests has at length been brought to a satisfactory conclusion. For particulars of the process by which the needle-like vegetation is converted into a woolly fibre, we refer to the Article *Wool from Pine Trees* published in this *Journal* in 1852. It attracted some attention at the time, and then seemed to be forgotten; but in Austria and Silesia, the experimental process has grown into one of manufacture. At a factory in Breslau, pine-tree wool is now spun and woven into a kind of flannel, which is largely used as blankets in hospitals, barracks, and prisons, in that city and in Vienna, with manifest advantage, for pine-wool drives away all disagreeable and noxious insects from the localities in which it is used. It can be used as stuffing for chairs, sofas, and mattresses in the same way as horse-hair; and some qualities are woven into a kind of cloth of which garments of many kinds can be made. It is said to be favorable to health as well as to cleanliness. The waste liquor from the pine-vats yields a valuable medicine, and from the waste fibre, gas is manufactured to light the factory.

The Agricultural Society of Compiègne are endeavouring to raise by subscription a sum of one hundred thousand francs, to offer as a prize for the best system of mechanical cultivation; that is, for machines which will supersede hand-labor in the work of a farm. There is much necessity for something of the sort in France, for the population of that country has rather decreased than increased for some years past, and as the large standing army takes away thousands of men from useful productive labor, the scarcity of hands is thereby aggravated.

The important discovery made by Dr. W. B. Richardson, that parts of the body can be rendered insensible to pain at the will of an operator, has been introduced into veterinary practice, and with such success that henceforth we ought to hear no more of horses being tortured by operations. This "local anesthesia," as it is called, is produced by directing a shower of ether spray on the part affected from an instrument which acts as a fountain throwing off the finest dew. In a short time after the instrument has been let to play on any part of the head, body, or limbs, all feeling ceases in that particular spot. During a lecture recently delivered, Dr. Richardson deadened portions of his arm, into which a brother-physician thrust large needles without occasioning the least pain. The importance of this discovery will be obvious; for the risk incurred by rendering the whole body insensible is avoided, and the most painful operations can be performed as insensibly to the patient as under the complete influence of chloroform. And the results obtained on the human subject are obtained also in horses, as has been made clear to the Society for the Prevention of Cruelty to Animals. Veterinary surgeons have used Dr. Richardson's process to render the parts insensible, and have cut out tumours, put in setons, made deep incisions to get at internal obstructions without pain to the horses. In cases of local inflammations, whether in the human subject, or in animals, the ether spray affords such a ready means of alleviating the pain and abating the attack, that it cannot fail to be

adopted. We see by advertisements in the public journals, that in recognition of the value of Dr. Richardson's discovery a testimonial is to be presented to him by the medical profession.

A method of inverse filtration has been brought out in Philadelphia, which, under some circumstances, would be more useful than the direct way as at present practised. It may be thus described: cover the mouth of a funnel with a piece of calico, or muslin, and plunge the funnel with the mouth downwards in the vessel of liquid to be filtered. To the stem or neck of the funnel, which is then uppermost, attach an india-rubber tube, whereby the whole is converted into syphon, through which the liquid, after rising through the muslin, flows rapidly, leaving the impurities behind.

Petroleum lamps have lately come into use, but many persons object to them because of the frequent-breaking of the glass chimneys. In halls, passages, and other places exposed to draughts of cold air, the loss of chimneys constitutes a serious item of expense. Oil of petroleum radiates so powerful a heat as to occasion the fracture of the glass on a lowering of the temperature. A means of obviating this loss has been tried in Germany with success: it consists in a double chimney, the outer one being very slightly larger than the inner, and both resting on the same base. If the outer one receives a chill, the film of air between the two, thin though it be, prevents the transmission of the shock, and the inner one remains uninjured. In this way the brilliant light of petroleum can be economically used; but it is worth mention, that in sitting-rooms where the temperature is uniform the breaking of chimneys but rarely occurs.

Among recent American inventions is a photographic cigar-holder. It is cleverly made of paper and quill, and is ornamented with a blank medalion, which, however, becomes filled with a photograph when the holder is used by a smoker. The heat of the smoke develops the picture, but in what way has not yet been made known. The cost of the article is trifling, and it affords a curious instance of the uses to which photography may be put.—*Chambers's Journal*, April, 1867.

Specialties in Farming—Hops.

The age of Honespun is past, and the tendency of society is now very strongly in the direction of the division of labor. Men confine themselves more and more to the doing of one thing as a means of livelihood. This is more manifest in other callings than in that of husbandry but it is beginning to be felt even in this. Fifty years ago, the farmer mainly clothed as well as fed his family, furnished lights and fuel, and did the most of his own tinkering and cobbling. One by one mechanics and manufacturers have come to his aid, until he has little else to do but till the soil. Long ago, the spinning wheel, cards and loom disappeared from the kitchen, and are now only looked for in the lumber of the garret. Tin candle moulds drove out candle rods and dips, and whale oil and petroleum banished tallow candles. Anthracite has taken the place of wood at many farmer's fireside, and the forest is only valued for timber. He no more sleds wood in winter, and his wife goes wool gathering among magazines and quarterlies rather than among Saxony and South Down fleeces. Instead of the general farming which was once almost universal in the North and East, we have now many specialties in husbandry, which are becoming more clearly defined. This, no doubt, has its advantages in pecuniary results, but we are not so clear about its influence upon manhood. The old style farming gave a wonderfully varied discipline to all the powers of body and mind. The modern gymnasium could hardly put the body into more postures, and better discipline every muscle. It