ELECTRICITY PRODUCED BY WIND POWER.

The employment of the wind for motive power purposes on land is a subject which has for many years past engaged the attention of the scientific world, but so far the results obtained from experiments made have not been very successful, and we seem at present to be as distant as ever from the attainment of any really practical issue in the matter. That windmills for grinding corn have been employed for generations is a well-known fact, but their use is gradually being discontinued owing partly to their inefficiency as compared with steam-driven mills, and partly to the variable nature of the wind which renders it impossible for a windmill to be kept constantly in operation. In Holland and Egypt there are many windmills employed to drive pumps for raising water, and in America they may be counted by thousands. In the latter country they are used for keeping up a supply of water in agricultural districts and in the reservoirs at railway stations. In our opinion these few instances represent, with one single exception, the only modes in which the wind has been employed on land for motive power purposes.

The exceptional case referred to is at present to be found in France in connection with the Nord Lighthouse at the extremity of the Cap de la Hève, which is about two miles distant from Havre. Electricity is employed as the lighthouse illuminant, and at the time of the putting up of the installation it was resolved to endeavour to utilise the motive power of the wind for driving dynamos. Accordingly, a windmill, or "wind-motor" as it is termed, of the modified Halladay type, was erected, and it develops about 18 H.P. when the wind is blowing at the rate of 33 feet per second. The wind-motor, which is mounted upon a wooden framework fixed upon blocks of masonry, imparts motion, by means of a vertical shaft and conical gearing, to a horizontal shaft placed at a suitable distance from the ground. On the horizontal shaft are mounted two pulleys which, by means of belting, drive two dynamos of different sizes which are connected to a series of accumulators. The speed of the wind-motor is automatically regulated by an apparatus which opens or closes the sails according to the velocity of the wind. The intensity of the current of the smaller dynamo is 8 ampères when the latter is running at 100 revolutions per minute, and 40 ampères when the speed is 200 revolutions; whilst the larger dynamo gives a current of from 40 to 100 ampères for a speed of from 250 to 650 revolutions. The mechanical efficiency is 4 H.P. for the small and from 4 to 6 H.P. for the large dynamo. The dynamos are run alternately, according to the quantity of energy stored in the accumulators.

It will be seen from the foregoing that this installation is certainly unique in character. It was put up some time ago as an experiment, and has answered the expectations of those concerned. That this should be the case is not surprising, when we consider the fact that the installation is on a *small scale*, but what would happen if a proportionate success could be obtained in central stations, say, of the size of that at the Grosvenor Gallery, or that in course of construction at Deptford? Would not the directors of our electric lighting companies rub their hands and dance for joy at this El Dorado—at being able to dispense with steam engines and boilers, which decrease in initial cost would enable them to supply light probably at the same price or even cheaper than gas? The gas companies would be at their wits' ends, their shares would go considerably below par, and our gas contemporaries would have to shut up their offices. What tremendous excitement there would be at the half-yearly meetings of our electric lighting companies, and how satisfied the shareholders would be to think that dividends were *at last* going to be paid. The electric lighting panic of 1882 would stand no comparison with what would take place under such circumstances. Shares would be at an exceedingly high premium, and the electric lighting millennium would commence!

Alas! It is to be regretted that such a fanciful dream cannot be realised, for the simple reason that there are three serious objections to the use of windmills for driving dynamos. In the first place there are the periods of calm, during which no movement of wind appears to take place; in the second place, the irregular velocity of the wind; and in the third place, the imperfect construction of the receivers or windmills. It is quite manifest that the first objection is insurmountable. The second has partly been overcome in the instance described above, by the employment of an automatic apparatus which opens or closes the sails according to the velocity of the wind; but how far such an arrangement could be used on a large scale we will not venture to predict. The last objection is, doubtless, one which might be surmounted; but the impossibility of overcoming the first objection, and the indefiniteness of the second, are sufficient proofs to show that the wind will never be utilised on an extensive scale for motive power purposes, and especially as regards electric lighting.—*Electrical Review.*

A SIMPLE AIR BATH FOR LABORATORY USE.

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The air bath ordinarily used in chemical laboratories for drying precipitates, for making determinations of water by loss, and for similar purposes, is usually a rather expensive piece of apparatus. The iron or copper closet, with its door, tubulure for thermometer, shelves, stand, etc., works no more satisfactorily because of its somewhat elaborate or difficult construction. In the cuts is shown a simple substitute for this apparatus, that as regards simplicity cannot well be excelled, while its other good features certainly operate to commend it. It consists of an inverted flower pot sustained upon an ordinary tin pan or sand bath, the whole being carried by a tripod or retort stand. The aperture at the top serves to receive a perforated cork, through which a thermometer is passed. An ordinary Bunsen burner is used to heat it. As the sand bath directly over the burner becomes very hot, it is advisable to invert a second smaller sand bath within the first, as shown in Fig. 2. This prevents too direct a radiation of heat from the hot metal. Upon this the little stand or bent triangle supporting the crucible or watch glass containing the substance to be heated may be placed. The thermometer should be thrust down through the cork until its bulb is near the substance to be dried, so as to obtain a correct indication of the temperature at that point. The entire arrangement is shown in external view in Fig. 1.

To place a vessel in it or to remove one, the flower pot is lifted off the sand baths. It will be observed that its porous nature provides a species of ventilation, while its composition assures it against corrosion. It even protects the plates below to a considerable extent, as drops of water or other fluid cannot run down its sides as it cools.

But convenient as it is in the role of air bath for simple drying operations, it will be found more so where drying tubes or retorts have to be manipulated at constant temperature. The flower pot can be perforated at any place, and holes of any size or shape can be drilled and cut through it with an old knife, file, or other implement. Thus in Fig. 3 it is shown in use for drying a substance at constant temperature in a