

tween the Place de la Concord, where there is a neat Swiss chalet sort of station, into the eastern entrance of the Palace. It consists of a C-shaped copper tube supported on posts. Within the tube there will be a moveable copper disc, from which a connecting wire will be attached to an ordinary tramway carriage and connected with a Siemens small dynamo machine within it, and by which the wheels of the tram-car will be driven. The current is supplied by a fixed Siemens generator of larger dimensions. The purpose of this arrangement is for the working of ordinary street tramways and cars, as they exist, by the addition of electrical appliances.—*Standard*.

#### DR. ANDREW CLARK ON ALCOHOL.

Dr. Andrew Clark lately delivered an evening address on alcohol, in the Great Portland Street School-rooms, London, to a crowded and deeply interested audience. He said he purposed offering a few informal remarks upon the influence of alcoholic drinks upon health, upon work, upon disease and upon the succeeding generation. This question of alcohol was of the first importance to us as a nation and as individuals, and hence a great responsibility rested upon those who professed to speak upon it with authority. He ventured to say that he knew something about this question. For twenty-five years he had been physician to one of the largest hospitals in this country (the London Hospital), and there, as elsewhere, it had been a part of his business in life to ascertain the influence which alcoholic drinks exercised upon health, and he had with deep interest and attention striven to get at the truth of the matter. In the first place let him distinctly say that alcohol was a poison, as were also strychnine, arsenic, and opium; but in certain small doses strychnine, arsenic, and opium were useful in special circumstances, and in very minute doses alcohol could also be used without any obvious prejudicial effect upon health. He was not going to discuss what these minute doses were, save to say that they were very minute. A perfect state of health (and it was rarely to be found) could not be benefited by alcohol in any degree, and in nine times out of ten it was injured by it. He said this not as a total abstainer, though he earnestly hoped that all the rising generation would be. Instead of the ideal state of health which might be enjoyed save for the nature of our surroundings, the sins of our parents, and our own sins, there was a sort of secondary health possessed by most of us, and what did alcohol do for this?

He had two answers to give—that this sort of health bore apparently with alcohol better than the other, and sometimes seemed as if benefited by it; and this was exactly the sort of health that formed the great debating ground of different people with respect to the use of alcohol. Secondly, there were some nervous people always ailing, yet never ill, for whom he had a profound sympathy, who seemed to derive great comfort from alcohol, and to these he had sometimes said, "Take a little beer or wine, but take great care never to go beyond the minute dose." He did not defend this, but simply stated it to show what he thought. As to the influence of alcohol upon work, Dr. Clark went on to encourage his hearers to try the experiment of total abstinence, and observe the result in regard to work. Let them, however, try it fairly, and not allow themselves to be deterred from it by the evil prognostications of friends. He was certain that if this experiment were tried each individual present would come to the conclusion that alcohol was not a helper of work, but, on the contrary, a hinderer.

Now as to the effect of alcohol upon disease. He went through the wards of his hospital to-day, and asked himself how many cases there were due to natural and unavoidable causes and how many to drink, and he came, after careful thought, to the conclusion that seven out of ten owed their ill-health to alcohol. He did not say that these were excessive drinkers or drunkards—in fact, it was not the drunkards who suffered most from alcohol, but the moderate drinkers who exceeded the physiological quantity. The drunkard very often was an abstainer for months together after a period of intemperance, but the moderate drinker went steadily to work undermining his constitution, and preparing himself for premature decay and death. He had no means of finding out how many victims alcohol claimed each year, but certainly more than three-fourths of the disorders of fashionable life arose from the drug of which he was speaking. Finally, Dr. Clark dwelt upon the heredity of the alcoholic taint, and closed by saying that sometimes when he thought of all this conglomeration of evils, he was disposed to rush to the opposite extreme—to give up his profession, to give up everything, and to enter upon a holy crusade preaching to all men everywhere to beware of this enemy of the race.

#### GAS FROM CASTOR OIL.

At the gas works of Jeypore, India, illuminating gas is made chiefly from castor oil, poppy, til, or rape seed being used when the supply of castor beans is short. One maund (82 pounds) of castor oil produces about 750 cubic feet of  $26\frac{1}{2}$  candle gas, or 1,000 cubic feet of  $18\frac{1}{2}$  candle gas. The process of extracting the oil for carbonizing is as follows: First the castor seed is passed through the crusher, when the shells only are broken off. The shells are then picked out by hand, and the seed is again introduced into the crusher, where it is ground to a paste. It is then passed into the heating pan, and, after being well heated, it is packed into horsehair bags and filled up hot into the press immediately. After about twenty minutes' pressing, the exuding oil being meanwhile collected, the cake is removed and ground over again. It is subsequently heated and pressed a second time until about 33 or 40 per cent. of oil is obtained from the seed. The labor of preparing and pressing the castor seed costs two shillings (about fifty cents), per maund of oil. The total cost of the oil is somewhat over \$5 per maund.

For generating gas, the oil is used as it comes from the press. Formerly, at other places, when the oil-bearing seeds were carbonized for gas without previous treatment as above described, the product was overloaded with carbonic acid from the woody part of the seeds, and correspondingly heavy cost for purification was incurred.

For out of town consumers, the Jeypore gas works supply gas compressed to about three atmospheres by means of a pump driven by a bullock. The compressed gas is then delivered in a wrought-iron receiver to the point of consumption, where it is either transferred into fixed receivers and burnt by the aid of suitable regulators, or is delivered into small portable or service gasholders, and burnt in the usual way. A *ghat*, or landing stage, two miles distant, is thus supplied with 400 cubic feet of gas every day, which is consumed by 30 jets, each burning  $1\frac{1}{2}$  cubic feet per hour for nine hours. There have not been any accidents from the distribution of gas in the portable reservoirs or otherwise. As railroad carriages are also supplied with compressed gas, it is evident that the introduction of this branch of service has widely extended the utility of the establishment. Another peculiarity of the Jeypore undertaking is the necessity that exists for the manager to unite the attributes of a farmer to his other acquirements, for the purpose of securing a constant and chief supply of raw material for gas making. Last year, the manager, Mr. Tellery, personally superintended the sowing of 300 acres with the castor plant (*Ricinus vulgaris*).

#### BELLS FOR SHEEP.

Mr. James S. Grinnell, writing in the *Springfield Republican* of bells on sheep as a protection against dogs, gives this illustrative experience:

"A good farmer in Leyden, who keeps about a dozen excellent Southdown ewes, always belled, was grieved and surprised one morning to find that dogs had raided his flock, killed two, mangled others, and scattered the rest. On collecting his little flock into the yard after a day's search he found that the tongue was lost from the bell. This was replaced, and never since have his sheep been worried. The experiment is so simple and cheap that it is worth trying."

#### TOUGHENED GLASS.

From the results of a large number of experiments it is found that the elasticity of toughened glass is more than double that of ordinary glass, and that toughened sheets bend much more readily than ordinary sheets. Single toughened glass has a resistance 2.5 times, and demi-double toughened glass a resistance 3.1 times that of ordinary double glass. Polished toughened sheets, of thickness varying from 0.006 meter to 0.013 meter, have a resistance 3.67 times as great as that of ordinary sheets of the same thickness, and the resistance of rough toughened sheets is 5.33 times that of ordinary rough sheets.—*De la Bastie*.

#### INCREASED OCCUPATION FOR WOMEN.

Mrs. Mary A. Livermore says that one evening twenty years ago a few ladies, interested in the welfare of women, discussed the employments open to women. They counted eleven and could think of no more. Recently the same ladies repeated the enumeration, and were able to point out 287 employments which women could engage in.