Oatmeal is one of the cheapest foods we have; that is, it furnishes more nutritive material, in proportion to the cost, than almost any other. Wheat-bread and rice, on the other hand, are the most expensive, in proportion to their cost, of the staple vegetable foods.

By taking into account all the nutritive substances, it is estimated that 25 cents will pay for .29 of a pound of nutrients in beef sirloin, .40 in round beef, and .92 in neck beef; oysters, .12 to .17; shad and bluefish, about .28: smoked herring, 1.21; cheese, 1.08 to 1.35; milk, .99; wheat-bread, 2.08 to 2.75, etc.

Of course, in the comparative value of foods, their actual physiological use is not unimportant. Foods rich in nutrients may not be readily assimilable, and only physiological experiments can finally determine their actual nutritive value.

From a study of the dietaries of factory and mill operatives, mechanics and other people engaged in manual labor in Massachusetts and Connecticut, the most noticeable features observed were the large quantities of food consumed, especially of animal food and fats. The total amount of nutrients per man per day varies in the Massachusetts dietaries from 690 grams to 1,052 grams; while in the European dietaries the normal range is from 653 to 863 grams. In the European the consumption of fats ranges from 13 to 100 grams, while in the Massachusetts dietaries in no case does it fall below 127, and reaches as high as 304 grams. If common usage in Europe, and the standards which are currently accepted there, are correct expressions of the proper quantities of food and of fat for healthful nutrition, the quantities of total food, of meats, and especially of fats, in the New England dietaries examined, are needlessly large, and in some instances excessively so. The dietaries studied all pointed in one direction, indicating that in this country a large excess of food is consumed, not only by well-to-do people, but also by those in moderate circumstances. This excess consists mainly in meats and sweetmeats, which are expensive, as well as physiologically injurious when consumed in too large quantities.

ELECTRIC LIGHTING IN ENGLAND.

OWING to the restrictions imposed by the act of 1882, electric lighting on any large scale is still a matter of the future in England, and the industry has not developed to any such extent as in Germany, Austria, Italy, or Belgium, and by no means as in this country. Perhaps partly from this interference with the development of a large system of distribution for electric lighting, and partly on account of the existence in England of large country houses in the possession of wealthy owners, the electrical illumination of single houses has been brought to a higher degree of perfection than domestic electric lighting in other countries. Men of wealth have constituted themselves into amateur electricians, the marvels of electricity apparently exerting a captivating influence upon their minds, and its study has been a hobby of many.

The pioneers of domestic lighting in England were Sir William Thomson, Sir William Armstrong, Mr. Coope, Mr. Sellon, and Mr. Charles Moseley. Sir William Thomson used a gas-engine, and worked his lamps directly from the dynamo, not only lighting his house, but also his class-room and laboratory in the University of Glasgow. Sir William Armstrong obtained his power from a waterfall in his ground. Mr. Coope used a steam-engine; and Mr. Sellon and Mr. Moseley relied on secondary batteries, obtaining their power from gas-engines.

The good examples thus set have been followed by many, and at present a great many private houses in all parts of the country are thoroughly and efficiently lighted. In fact, electric lighting is becoming a fashion, and in the opinion of Mr. Preece, as expressed at a recent meeting of the London society of arts, "the only fear of its ultimate general success is its falling into the hands of the inexperienced and ignorant."

Steam, gas, and water power have been satisfactorily used as agents for the production of power. Petroleum has not as yet had a trial in England, and wind is too uncertain to be relied on. Mr. Preece believes that a simple effective steam domestic motor has not as yet been introduced; but in this opinion he was criticised by Mr. Crompton of the Society of arts, who affirms that there are several English engines which could be worked by a gardener or butler as satisfactorily as a gas-engine. But most of the high-speed engines require more technical skill than is usually to be found among the domestics of an ordinary household. On this account the council of the Society of arts has under consideration a plan of offering prizes for the best engines designed to fill the special purposes of providing power for electric lighting. The competition will probably be extended to all classes of engines, — steam, gas, petroleum, or what not.

At present the gas-engines seem best adapted to supply the need. According to the statement of Mr. Preece, 25 cubic feet of gas will give us one horse-power, or eight 20 candle-power glow-lamps, or 160 candle-power all told; but five 5-feet burners will give only 75 candles when

burned in air with ordinary burners. Gas-engines, moreover, are within the intelligence of butlers, gardeners, and coachmen: they are always ready for work, they attain their maximum efficiency at once, and they can be stopped in a moment.

In England the opportunities of using water-power are few and far between. The power of the tide or that of a flow of the river is very small when utilized within the limits of ordinary people. The whole flow of the Thames through London bridge would maintain only 800 lamps. In Scotland, however, the case is somewhat different. There several persons have utilized the water stored up in lakes. Many wonder why the wind is never used; but, apart from its uncertainty and unreliability, there is the fact that the power developed by the best windmills is, on the average, but very small.

After referring to the sources of power, Mr. Preece turned his attention to the dynamo, and claimed that science, since the expiration of the Gramme patent, has converted a crude instrument into the most powerful converter of energy that exists. The forms of dynamo, he said, are being whittled down to two or three recognized shapes; but "as long as the spirit of rivalry is stirred up by competition and emulation, so long shall we have some manufacturer who will make a change for the sake of a change, and who will advertise his wares as the best in the world." Mr. Preece holds that little remains to be desired in the quality or price of dynamos, and that a well-constructed dynamo, kept clean and well lubricated, never overworked, should last a lifetime without much attention except to the brushes and commutator.

It is by means of the secondary battery that regularity and uniformity of current are maintained in isolated installations; and it supplies a reserve of force that renders one free from accident to engine or dynamo. Its early failures disappointed many; but Mr. Preece hopes that it has 'sown its wild oats,' and that it has become a mature, sober, practical instrument. Sir William Thomson writes, "My cells have worked to perfection. It is the greatest possible comfort to us in the house to have the light with satisfactorily equal brilliancy at all hours of the night and day, and every day in the week. I have now cut off the gas at the meter, so that there is absolutely none used in the house. I have no oil-lamps, and have not used so much as a single quarter of a candle within the last three months, and have the electric light in every part of the house where light can possibly be wanted by night or by day." Mr. Preece now uses the secondary batteries, not, as formerly, as regulators to his engine, but for the storage of electricity, charging them during the day, and discharging them through the lamps at night. He maintains that the durability of his cells is most satisfactory, and that he can see no reason why they should not last ten years at least.

Of the lamps, Mr. Preece could not chronicle so great progress as that of dynamos and secondary batteries, and he held that a good standard glow-lamp has not yet been devised. He would prefer a 10-candle lamp, working under a pressure of 50 volts, and requiring half an ampère: that would mean the absorption of 25 watts, or two and a half watts per candle. The life of such a lamp would not be very great; but, if it were cheap enough, one would not mind frequent renewals. Makers of lamps seem to consider that there is great credit in securing long life; but this may be unfortunate, considering the deterioration of glow-lamps with age, owing to the wasting-away of the carbon and its deposition on the glass globe. Mr. Preece would have a lamp such that we could afford to give it a 'short and merry life.'

There is felt in England, on account of the small development in the industry, a difficulty in obtaining experienced workmen; and in some cases it has been necessary to send nearly the length of the island for men to put in the wires and machinery.

Mr. Preece's estimation of the cost is just twice that of gas; but this, whether too high or too low, seems to be in doubt, and it is certain that the cost is largely dependent upon the extent to which the light shall be used. Considerable impatience is felt at the restrictions imposed by the act of 1882, and the council of the Society of arts is taking an active part in supporting the measure now before the house of lords, intending to extend the facilities for introducing electric lighting. This act is understood to be under the direct supervision of Lord Rayleigh.

THE PROPOSED FISHERIES BOARD OF GREAT BRITAIN.[1]

I am of opinion that the less the government interferes with any branch of industry, the better, and that, as a general rule, the cost and trouble of obtaining such scientific information as is necessary for the successful prosecution of a branch of industry ought to fall upon those who profit by it, and not upon the general body of the

[1] Letter in response to a request from the secretary of the Society of arts for Professor Huxley's views as to the constitution of a fisheries board.