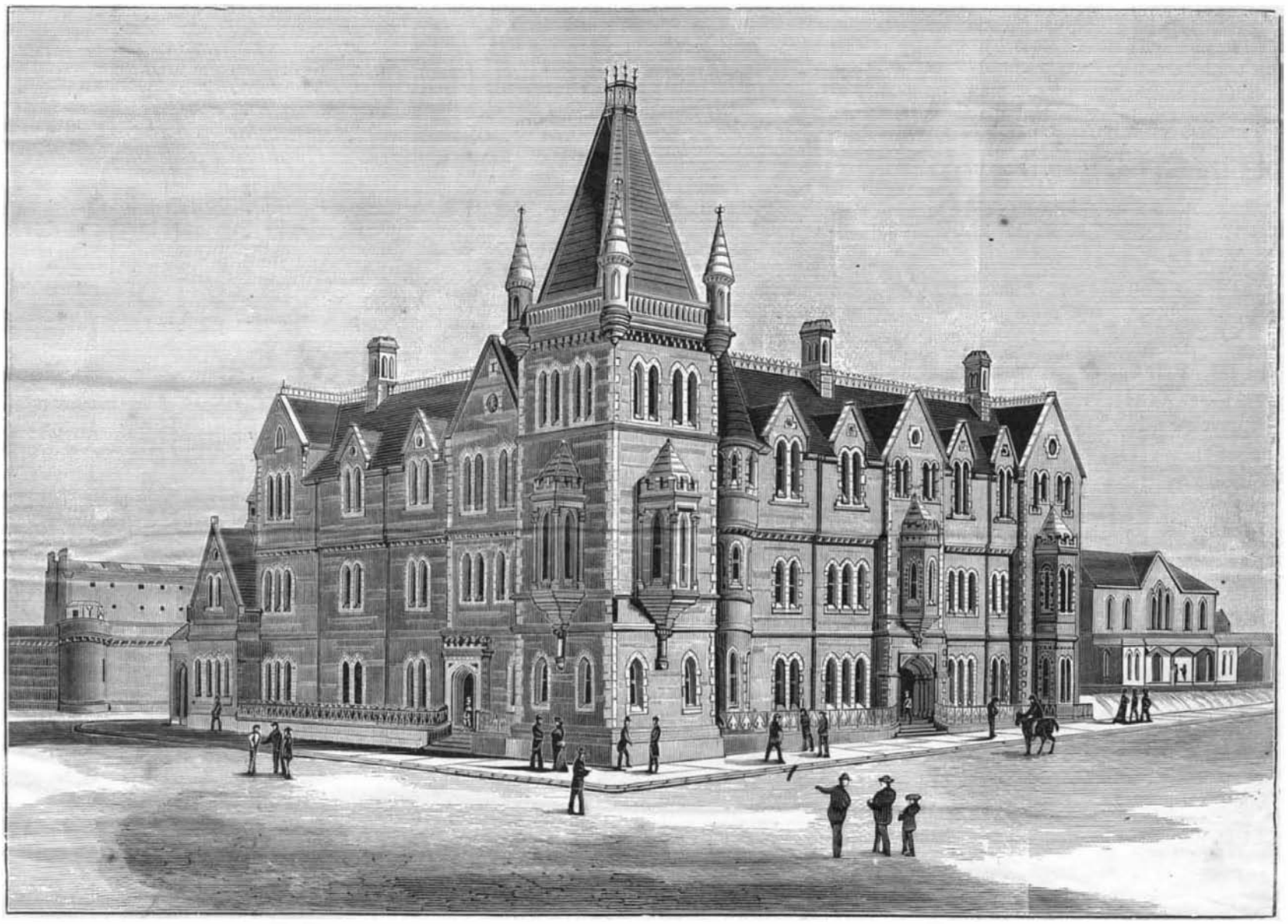
A "WORKINGMAN'S" COLLEGE, MELBOURNE.

The accompanying illustration represents one of many endowed institutions with which the young city of Melbourne, Australia, is liberally supplied. The city had grown from a population of 25,000 in 1851 to 300,000 in 1881, and with this rapid growth many great fortunes were made, principally in gold mining, wool growing, and land speculations, and many of those thus suddenly acquiring wealth have expended it with a free hand in beautifying their principal city and the founding of educational institutions. The "Workingman's" College herewith shown is free to all, instruction being given therein to all applicants, both day and evening, in practical mechanical work of a wide variety, mechanical drawing, mathematics, and all those branches which will aid an industrious and determined workman to rise in his calling. It is one of those practical institutions everywhere needed, but likely to be especially useful in a new and rapidly growing country, where the adventurous and enterprising from all quarters of the world are attracted in unusual numbers.

Melbourne is built on numerous gentle hills, which show off to advantage its many fine public buildings.



WORKINGMAN'S COLLEGE, LATROBE STREET, MELBOURNE, AUSTRALIA.

The streets are all 99 feet wide, and the parks, squares, and gardens are so numerous that with only one-thirteenth the population of the city of London it occupies nearly half as great an area. The Melbourne University is a picturesque mass of buildings, behind which is the National Museum, freely open to the people, as are all public places in Melbourne. There are in Melbourne, among its numerous state schools, about thirty whose size and proportion entitle them to rank with the architectural ornaments of the city. It is said there is no city where more has been done for the working classes, or where they have made so good a use of their advantages, about three out of every four mechanics who have reached middle life owning the cottages they occupy.

Steel Rails in the United States.

The productive capacity of the steel rail mills of the United States is about 1,600,000 tons per annum. About 600,000 tons went into new lines last year, and the amount used as renewals, new second track, and siding is estimated at 650,000 tons, or 5·42 per cent of the total amount of rails in track. This rate is equivalent to a renewal of the lines once in 18·4 years. At the end of 1883, a little more than half the track of the United States was iron. The consumption of rails for maintenance ran down from 10·30 per cent in 1872, when steel rails were first used, to 5·92 per cent in 1877; then rose again to 11·16 per cent in 1881, and receded again to 5·42 per cent in 1883. The production of steel rails increased from 83,391 tons in 1872 to 1,304,393 tons in 1882.

The Bellevernon Gas Well.

The Bellevernon (Pa.) gas well is now nearly 2,800 feet deep, and drilling ceased. At about 200 feet, a 3 foot vein of coal was struck, and was the only coal found. At 400 feet a pretty strong vein of salt water; and at 600 feet another vein of salt water. At 1,950 a vein of gas was found in what appeared to be a compact rock formation. The gas not being as large in volume as desired, the drill was sunk to the present depth of nearly 2,800 feet, and no more gas being found the well was torpedoed at the gas vein, first with 40 quarts of nitro-glycerine, and then with a hundred quart torpedo, enough to turn the well inside out. This increased the flow of gas, and it is thought there is sufficient now to heat a 10 pot furnace.

New Alcoholic Ferment.

At Busalla, in the north of Italy, there is a small brewery which has gained a considerable reputation for its beers brewed on the low fermentation system. Last season these beers were very inferior, and without any apparent reason. A local chemist, M. Mendes, was called in to investigate the matter, and the result of his researches was the discovery of what is believed to be a new form of ferment. Among the cells of ordinary Saccharomyces cerevisiæ were some of Saccharomyces Pastorianus, and some other cells very much smaller in size; these latter were isolated and cultivated by themselves, and were then found to be almost spherical in shape, and from 1-300 to 1-500 of a millimeter in diameter. The shape, size, and general appearance of the cells of this ferment were found to be very constant, and they very closely resembled those represented on the right hand of the plate iii. in Pasteur's "Etudes de la Biere." So far there would be nothing very remarkable in the identification of a new form of ferment, but M. Mendes by some carefully conducted experiments has proved that this ferment is altogether without action on cane sugar. It is generally admitted that ordinary yeast is not capable of directly fermenting cane sugar, but that it first exerts an inversive action on cane sugar, and after this inversion fermentation takes place. Now the peculiarity of the new ferment discovered by M. Mendes is not that it will not ferment cane sugar, but that it will not invert it. Experiments were made with this new ferment on impure cane sugar solutions, and the result was said to be that the glucose and invert sugar was fermented by it, but the cane sugar was left untouched. The practical importance of this discovery to sugar refiners must therefore be very great, and it is at the same time of very considerable interest to brewers. We propose to refer to it in greater detail on a future occasion.

A Wonderful Grotto.

A correspondent in Cagliari writes to the *Avenire di Sardegna* the following description of the stalactite grotto discovered not long ago at Dorgali, in Sardinia, which is approached by a difficult and tortuous path leading down into a gloomy ravine on the mountainous coast: "The grotto commences by an ample space, the vault of which is supported on columns. On the rocky ground may be seen the print of a human foot. From this place you enter a vast hall of such magnificence that it extorts an exclamation of wonder. Sixteen columns with varicolored capitals rise from the marble floor and sustain a pure white roof, from which depend the figures of birds, guns, serpents, baskets of fruit, and a thousand other tricks of nature. But the most striking object is an altar ornamented with enormous baskets of colored flowers, and on which are large candelabra and a shrine so exactly imitated that you are tempted to try to open it in order to see the chalice within. From the roof above hang festoons of flowers, which reach down almost to the altar as if attempting to conceal it. The most wonderful thing in the hall was, however, the petrified skeleton of a majestic stag, which was partly destroyed by visitors, and the spin which has been sent entire to a professor of natural history in Cagliari. The grotto contains six other large chambers, decorated with arabesques in stalactite, and full of pillars, human figures, opaque mirrors, and other wonderful imitations of objects of art and nature."

Cab and Hack Indicator.

Ackerman's *Gewerbe Zeitung* gives a description of a new apparatus for cabs, hacks, gurneys, etc., to register the amount of time each person hiring the vehicle retained it and paid for, thus preventing the possibility of fraud on the part of the driver. Most of these registering apparatus are too complicated and expensive for general use, but this objection does not apply to this new invention. It consists of a clock movement with index and dial beneath each seat in the cab. The movement is inclosed in a box to protect it from dust, and when the cushion is lifted up, a small cover over the dial is seen; this cover locks down, and only the owner of the cab line keeps the key. Lifting this cover, the register can be read at a glance. The cushion is so arranged that the weight of a person seated upon it presses a lever in the clock works and sets the train in motion, while the weight of any ordinary article of baggage is not sufficient to accomplish this. The train keeps in motion as long as the seat is occupied, but stops short when the customer quits the vehicle. By this means the proprietor is able to inspect this automatic register of the number of hours and minutes the vehicle has been employed in transporting passengers.