

PRODUCTION OF HEAT AND LIGHT.

On page 290 of our volume XXXII., we illustrated and described an invention of Mr. Cowan, a Scotch gentleman, combining a hot water heating apparatus with a limekiln or small gas works. The system seems to be likely to come into extensive use in Europe, a company being already formed for bringing it into operation; and they have recently purchased a vineyard at Garston, near Liverpool, containing six acres of ground, which is nearly all covered with glass, and in which four miles of iron piping is employed for heating purposes. We publish an engraving of this establishment, which is now heated entirely by surplus heat from limekilns, although till recently 16 hot water boilers were employed, at a considerable expense for fuel. A correspondent of the *Agricultural Gazette*, from the pages of which we select the engraving, recently visited the place; and he states that, although the limestone has to come by rail, and costs about \$2 a tun, the vineyard is heated nearly free of cost, the lime sold paying the expenses. Lime burning is as suitable a process for combining with the heating as the making of gas; for lime is as necessary to the farmer as to the builder. Moreover, if a large area of hothouses could be used, gas to supply the adjoining villages, lime for the whole neighborhood, and warmth for the cattle sheds in winter could all be furnished.

A writer in the *English Farmer* states that "a large party met and spent a day or two, and some of them a night or two, in the Garston vineyard. After the most careful inspection, it is a satisfaction to be able to add that the heating was most satisfactory. The limekilns gave out a powerful steady heat, warming the pipes easily to temperatures ranging from 100° to 140°, according to the distance from the kilns. These temperatures are absolutely sufficient for all horticultural purposes. The new system entirely abolishes the anxieties of night or day stocking. It is only needful to charge the kiln once in 12 or 24 hours, and the joint combustion of the limestone and fuel will maintain the temperature steadily, without varying hardly 5°."

"Neither can there be a doubt about the economy of the limekiln heating. Several gentlemen who have had it in operation for two years declared that the entire cost of the fuel was defrayed by the lime sold."

"The company have also added cheap lighting to the heating of horticultural and all other buildings. The vineyard is already lighted with gas made by placing a retort over the limekiln. This adds to the heating power of the kiln, as the conversion of the coal in the retort into coke and gas gives off additional heat, which is at once absorbed by the boiler astride of both."

"It may not be possible for many or any of our readers to erect a kiln for themselves to light and warm their villa premises, hothouses, or gardens. But villas are often built in blocks, and large numbers of them are not seldom placed within easy reach of each other. Surely in such cases it might be possible to have a common kiln erected, and heat and gas conveyed to all who wanted them, at a remunerative rate. There need be very little more difficulty in conveying hot water to hothouses or mansions than there is in taking coal or gas. Of course there must needs be a double line of pipes, a flow and a return, and some means would have to be used to keep the water warm on its passage. But all these are matters of detail that would be more than compensated by the simplicity of merely turning a tap on when heat was wanted, and turning it off when it was not."

THE YUCCA STRICTA.

Nearly all the hardy species of yucca inhabit the shifting sands of the seashores of northeast America, from Virginia southward to Florida, and, therefore, they are admirably adapted for planting in similar situations; but they will flourish in any thoroughly drained, free soil, open sunny places suiting them best. They grow rapidly and flower freely in gravelly soil, and we have also seen them doing well on various sand formations, and on the chalk; but they thrive best of all on a deep alluvial soil.

For the rock garden, for massing on knolls, for planting singly, for association with other plants with ornamental foliage, for planting in formal gardens, and for a variety of other purposes, the yuccas

stand unrivaled. Although loving a deep free soil, especially where there is moisture below, they will succeed in a stiff loam; but in a heavy soil, slightly raised mounds should be selected, or they are liable to suffer in winter, and rarely flower. In very dry seasons they should be liberally watered; this promotes growth and the production of flowers; but yuccas will bear a long drought without actual injury. This may be verified where small garden plots are drained completely dry, and where rain runs off the ground unless the precaution is taken of keeping the surface moved. Nevertheless, yuccas should be extensively planted in towns, not

branches of the panicles are long, and bear as many as dozen flowers, and the latter are comparatively large. *Yucca stricta* is described in *La Revue Horticole* as a short stemmed plant which, at the surface of the soil, presents a spherical mass of leaves, which are very numerous, and measure some 16 or 17 inches in length, and about half an inch in breadth. They taper off to a point, are straight or sometimes a little bent, slightly canaliculated, and bear upon their edges whitish gray filaments; the youngest leaves are somewhat shorter and broader than the others, and are glaucous on the interior surface. The flower spike is green,

pubescent, and strong, attaining a height of 3 or 4 feet. The twin flowers, which are often solitary on weak stems, are at first greenish, then yellow, and subsequently nearly white. The external divisions are about 1½ inches long, and three quarters of an inch wide; the interior ones are oval and somewhat larger. This plant, which commences to flower toward the end of June, sends out but few suckers. It seems to be intermediate between *y. flaccida* and *y. filamentosa*.

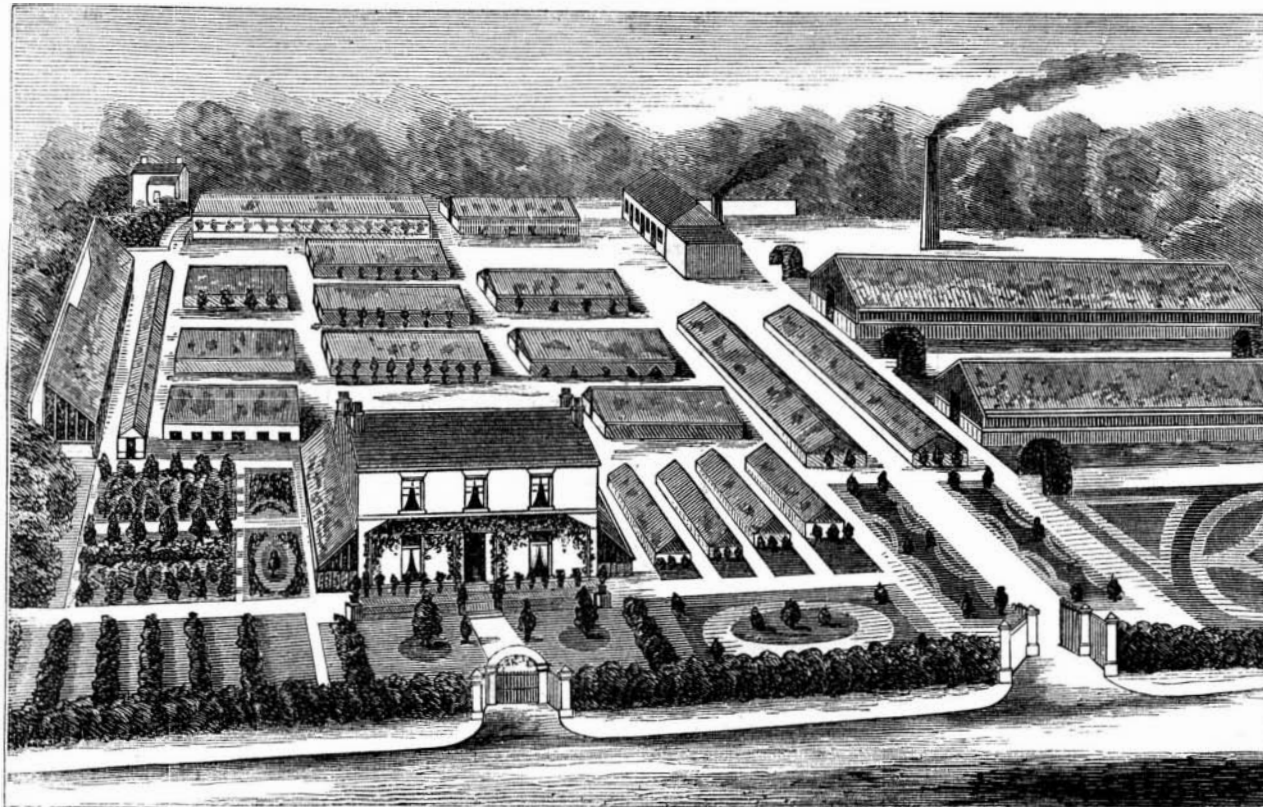
Gas Explosion.

At Hamilton, Ontario, one evening recently, a quantity of gas escaped from the street pipes into a sewer. Some workmen were sent to discover the leak, and the sparks caused by striking stones with their boring tools set fire to the gas, and the flame followed the sewer, causing an explosion about one hundred feet distant. The building under which the explosion took place received a severe shock, all the glass in the windows being broken, the walls and floors badly cracked, and a man thrown out of his chair.

A New Telegraph System.

A new telegraph system invented by Paul La Cour, Vice-President of the Royal Meteorological Institute at Copenhagen, obtained considerable attention lately at the International Telegraphic Congress at St. Petersburg, where the inventor exhibited it. The invention is thus described by the inventor: "The system does not consist in a new form of receiving and transmitting apparatus, which, by the talented combinations of Hughes, Wheatstone, Siemens, and others, has attained such a state of perfection that great improvements seem improbable. La Cour's system, however, opens up a new scope for telegraphy, in that he has constructed some simple instrument, whereby the electric current, by being passed through a different instrument, obtains different qualities, whereby it can act upon corresponding instruments at the receiving station. Supposing twenty conducting wires be led from one of the poles of a battery through twenty such instruments; then, by connecting each or some of these with a single telegraphic wire, the following result is obtained, namely, that an electric local current is produced in the twenty corresponding conducting wires on the receiving station, exactly as if the twenty conducting wires on the transmitting station were connected with the twenty conducting wires on the receiving station by means of twenty separate telegraphic wires. Each of these instruments contains a tuning fork connected with an electro-magnet and two wire coils, so that the electric current becomes isochronously vibrating in the measures which correspond with the notes of the tuning forks; and thus those tuning forks in them which have the same note as those in the transmitting instruments are set vibrating, and a current is caused in their local wires."

The above system appears to be identical with that of Mr. Elisha Gray, of Chicago, an account of which we published in the *SCIENTIFIC AMERICAN*, August 1, 1874. It was there stated that the invention had been tried with success over a circuit of 2,400 miles on the Western Union Telegraph lines. Details of the *modus operandi* were given, sufficient to enable any skillful electrician to construct an apparatus on the same plan. Now it may be that the Vice-President of the Royal Meteorological Society of Copenhagen did not see the *SCIENTIFIC AMERICAN*, although we have subscribers there, and we believe our paper is on file in some of the libraries of that city; it may be also that he is an independent inventor of the improvement. But unless he can produce proofs of an earlier date of invention than Mr. Gray, M. La Cour should in justice publicly accord to the latter the honors of priority. Electricians will look with interest for M. La Cour's response in this matter.



THE GARSTON VINEYARD, NEAR LIVERPOOL ENGLAND.



THE YUCCA STRICTA.