THE RECENT MILLING EXHIBITION.

For the twelve months to July 1 our exports of wheat from sixteen principal ports were 149,139,293 bushels, and our exports of wheat flour for the same period were 5,787,967 barrels—an increase of 40,045,758 bushels wheat and 437,358 barrels of flour as compared with our exports from the same ports for the year ending July 1, 1879. The value of these exports for the last year was $219,954,354, against $155,540,633 for the year preceding, the increase in value of the exports of flour alone being $5,913,863. The total exports of wheat flour from the United States for the year ending July 1, 1879, were 5,629,714 barrels, and of wheat 122,353,936 bushels, Great Britain and Ireland alone taking 2,629,665 barrels of flour, and next in order coming respectively, Brazil, British West Indies, British Possessions in North America, Hayti and San Domingo, and Cuba, while France and Germany took but 27,075 and 11,233 barrels respectively.

Probably the question which came with most force to the minds of all American millers who attended the International Exhibition lately held at Cincinnati was this: Can we, and if so by what means, considerably and permanently increase our exports of manufactured flour, instead of sending abroad so much wheat to be ground by foreign millers? While those present from abroad, who examined the wonderful display there made of American improved milling machinery, were undoubtedly at the same time revolving in their minds the possibilities of this question being answered in the affirmative. As for the trade with countries which have not been accustomed to making their own flour there can be little doubt that it is quite within the ability of our millers to compete successfully, but when we already make such considerable shipments, and more than half of our exports of manufactured flour, to Great Britain and her West Indian dependencies, there is evidently good ground for hope that we may yet materially extend this trade in all countries where there is a demand for American wheat. Looking at the matter in this light, the late Millers' Exhibition had a national significance, as, in showing the advancement our mechanics had made in this branch of industry, it indicated the possibility of a still larger field for labor here, to be profitably employed in competition with European cheap labor only because of the improved machinery our millers have introduced.

To mention in detail all of the different kinds of machinery and appliances for milling and in its collateral branches shown at Cincinnati would fill a large proportion of this paper. Commencing with a large variety of turbine wheels and many improved patterns of engines, with all the appurtenances of shafting, gearing, etc., which belong to all manufacturing establishments where power is employed, the display comprised nearly everything used in the milling business in this country, together with much that is thought best of the machinery used in England, Germany, Austria, Switzerland, and France. There were many kinds of gradual reduction mills; smooth and corrugated roller mills in great variety; bolts, bolting cloths, and reels of widely differing patterns; scouring, cleaning, brushing, and heating machines; hand and power millstone dressers of many kinds; electric and other purifiers, etc.; and nearly all of the machinery was shown at work, the flour made affording samples from which bread was baked in one of the departments of the Exhibition. For the best flour made on the grounds the award went to an Indiana firm, but the most important exhibits of flour and grain were from the States of Ohio, Illinois, Iowa, Kansas, and Missouri, although great interest was shown in an exhibit of Hungarian flour, which, though excellent in quality, was thought to be decidedly inferior to many of the samples shown by our own millers. A gold medal which had been offered for the greatest improvement in milling in the last ten years was awarded to a Michigan firm for the middlings purifier; a premium for the best mixing and sifting machine went to Prussia, and for the best bolting cloth to Switzerland, while a Budapest firm in Hungary received an award for the best roller mill.

In short, the Exhibition presented a comprehensive epitome of about all that is now being done in the milling business, either at home or abroad, and, as the trade is now in a sort of transition state—the minds of millers being divided on questions of high or low grinding, gradual reduction, and new process methods—it cannot fail to have had a most decided influence, which will make itself apparent in the future of the business in this country. German and Austrian mechanics have, during the past few years, rather taken the lead of England in improvements in milling machinery, but there is nowhere else so great a variety of excellent appliances for the business, some of which are of acknowledged superiority, as American inventors and mechanics have brought forward and perfected for the use of our millers. It is this fact alone which accounts for the past increase in our exports of flour, and gives promise of our being able in the future to export the products of our wheat fields in the shape of flour to a much larger extent than we have hitherto done.

ARTESIAN WELLS IN CALIFORNIA.

The necessity of irrigation in Southern California, and the large area of land dependent solely upon flowing wells for water-supply, have led to a remarkable development of artesian wells, especially in the San Bernardino and Los Angeles basins. The main artesian belt is that running through the coast valley of Los Angeles where the number of wells approaches six hundred. The majority of these wells are in three clusters, adjacent to the rivers Los Angeles, San Gabriel, and Santa Ana, and around Compton, Artesia, and Westminster. The wells range in depth between 50 and 550 feet, the general depth being from 150 to 200 feet.

Some of the wells irrigate from 100 to 200 acres each, though a well which will irrigate 40 acres is considered a good one. According to the recent report of Assistant State Engineer, Jas. D. Schuyler, the first flowing well in Los Angeles County was bored by ex-Governor Downey, two and a half miles from Compton, in 1868. Since that time the general desire to secure by such means a constant supply of pure water has led to a rapid multiplication of wells, until now almost every farm-house in the belt rejoices in a spouting well. The pipes are usually carried two or three feet above the surface of the ground, and the clear water pouring over the top has the appearance of a dome of glass glittering in the sunlight.

In boring the first well it was found that the upper water-bearing stratum, 40 to 125 feet below the surface, was so largely composed of quicksand, which rapidly filled the pipes, that it was necessary to go deeper for a permanent supply. The second water-stratum was open to the same objection, though it yielded an abundance of water; and the third, though more gravelly, contained sand enough to be troublesome. To overcome these difficulties, and at the same time utilize the several water-bearing strata passed by the pipe, a contrivance was invented for slitting the casing. The slits, which are about six inches long, and so narrow as to exclude the sand, are made lengthwise and in groups of not more than three in any one section. If the water-bearing stratum is under forty feet in thickness, the pipe is perforated the whole distance, the bottom of the pipe always resting on an impervious stratum. In one well, eight miles south of the city of Los Angeles, the first water-bearing stratum was struck at 85 feet, and was 10 feet thick. The second occurred at a depth of 316 feet, and extended 17 feet, as far as the pipe could be pushed down, ending in coarse gravel. The force of the outpouring water brought out a bushel of gravel, the largest stone just filling the pipe and weighing four pounds. The head was sufficient to raise the water in a pipe 20 feet above the surface. In another well, sunk from the summit of a mound, near the sea coast, and 52 feet above the general level of the plain, surface water was found at a depth of 26 feet, and at 196 feet artesian water was struck, rising to within six feet of the surface. A remarkable natural artesian spring occurs on a high hill between Old and New San Gabriel Rivers. In a sag of the hill, perhaps eighty feet above the surrounding plain, is a springy marsh, from which water flows westward to the sea and eastward to the valley. The shallowest flowing well is 1½ miles west of Santa Ana, a few hundred yards from the river. It is but 44 feet deep, and yields a large discharge. Three hundred yards away a well was bored 300 feet without striking water. In the southern portion of the artesian belt, near Westminster, the water strata are at depths of 80 to 230 feet, the lower yielding the strongest flow.

It is found that as the number of wells is increased the flow of all is lessened, while some of those on the higher land have gone dry. The level to which the water will rise in the pipes steadily fell in Los Angeles County until two years ago, since which time it has slowly risen. The fall amounted to 6 feet, about 1½ feet having been restored. The diameter of the majority of Los Angeles County wells is 7 inches. The temperature of the water is about 62° Fah., with the exception of some deep wells at Pomona, which show 67° Fah., summer and winter.

The area of the Los Angeles belt is about 300 square miles. In San Bernardino County the area in which flowing wells are obtained is about 30 square miles. The topography and geology of the valley show very clearly that it was originally the bed of a lake, which has been filled up by the erosion of the surrounding hills. Most of the San Bernardino wells are for domestic use and garden irrigation, and are but two inches in diameter; some are as large as eight inches. The most northerly well is 262 feet in depth; the most southerly, which yields the finest flowing stream in the valley, is 99 feet deep. The average depth of fifty-six wells built by one firm is 160 feet, the range lying below 80 feet and 380 feet. The deepest well in the valley is furthest east, and has a depth of 410 feet, with a diameter of 7 inches. Vegetable matter, consisting of decayed tule roots and pine wood, was brought up from the last sixty feet. Small suckers, two to four inches in length and resembling the same fish as found in the mountain streams, were occasionally ejected from this well. This well afforded a fine flowing stream, but was spoiled in an attempt to perforate the pipe at 350 feet to secure the water of the first stratum. The incisions were made too close together; a strip of pipe was accidentally torn out, and the quick-sand rushed in faster than it could be pumped out. The pipe is now filled with sand and clay up to the level of the incision, shutting off the flow. The next well to this has a depth of 285 feet.

Gas Detection.

An ingenious instrument, termed a "spark tube," for indicating the presence of inflammable gases in mines, was lately exhibited and explained at the meeting of the Manchester Geological Society, by Dr. Angus Smith. The design of the instrument is taken from the old compression syringe used for igniting tinder, and the instrument consists of a small brass tube with glass let in at the bottom, which is closed up, and a piston and rod fitting closely in the tube. The air to be tested is taken into the tube either from the top or by means of a stop cock at the bottom, and the piston then rapidly pressed down with the hand, the compression of the air thus effected with the aid of spongy platinum causing the gases to explode inside the tube, the explosion being visible through the glass let in at the bottom. Dr. Smith stated that the presence of gas down to 2½ per cent could be detected by this instrument, and as the explosion within the tube was perfectly harmless, he thought the instrument might afford a useful means for exploring gaseous mines.

Remarkable Discovery of a Murder.

The following account of a murder which was committed in Bermuda in the autumn of 1878 is by the Attorney-General of the islands, Mr. S. Brownlow Gray:

"In the autumn of 1878 a man committed a terrible crime in Somerset, which was for some time involved in deep mystery. His wife, a handsome and decent mulatto woman, disappeared suddenly and entirely from sight, after going home from church on Sunday, October 20. Suspicion immediately fell upon the husband, a clever young fellow of about thirty, but no trace of the missing woman was left behind, and there seemed a strong probability that the crime would remain undetected. On Sunday, however, October 27, a week after the woman had disappeared, some Somerville boatmen looking out toward the sea, as is their custom, were struck by observing in the Long Bay Channel, the surface of which was ruffled by a slight breeze, a long streak of calm, such as, to use their own illustration, a cask of oil usually diffuses around it when in the water. The feverish anxiety about the missing woman suggested some strange connection between this singular calm and the mode of her disappearance. Two or three days after—why not sooner I cannot tell you—her brother and three other men went out to the spot where it was observed, and from which it had not disappeared since Sunday, and with a series of fish hooks ranged along a long line dragged the bottom of the channel, but at first without success. Shifting the position of the boat, they dragged a little further to windward, and presently the line was caught. With water glasses the men discovered that they had caught it in a skeleton which was held down by some heavy weight. They pulled on the line; something suddenly gave way, and up came the skeleton of the trunk, pelvis, and legs of a human body, from which almost every vestige of flesh had disappeared, but which, from the minute fragments remaining, and the terrible stench, had evidently not lain long in the water. The husband was a fisherman, and Long Bay Channel was a favorite fishing ground, and he calculated, truly enough, that the fish would very soon destroy all means of identification; but it never entered into his head that as they did so their ravages, combined with the process of decomposition, would set free the matter which was to write the traces of his crime on the surface of the water. The case seems to be an exceedingly interesting one; the calm is not mentioned in any book on medical jurisprudence that I have, and the doctors seem not to have had experience of such an occurrence. A diver went down and found a stone with a rope attached, by which the body had been held down, and also portions of the scalp and of the skin of the sole of the foot, and of clothing, by means of which the body was identified. The husband was found guilty and executed."

The Germination of Unripe Seeds.

Many instances have been put on record by different observers of unripe seed germinating, and several botanists have conducted extensive series of experiments in raising plants from seeds in different stages of development. At first sight it seems rather surprising that an imperfectly-formed embryo should grow into as vigorous a plant as a mature one; but, when we understand the general plan of growth in plants the phenomenon is intelligible. Thus, ferns actually develop from a single detached cell. This property of premature germination may be taken advantage of in practice in propagating plants that do not fully ripen their seeds in our climate. A rather longer period elapses before unripe seeds actually germinate, but frequently the progeny is equal to the best from mature seed. Formerly it was supposed that only ex-albuminous seeds would germinate when unripe, but M. Sagot, a Frenchman, succeeded in germinating green grain of wheat in which the albumen was soft, semi-liquid, and milky, and several other experimenters have raised different cereals from grain collected a fortnight to three weeks before the crops from which it was taken were ripe. Although the practice of sowing unripe seeds is not likely to become general, and would not be profitable under ordinary circumstances, it might be useful to know, in the case of a rare plant suddenly dying before its seeds were mature, that there was a possibility of their germinating, and thus preventing the loss of, may be, a valuable plant.

How a Water Moccasin Fishes.

A correspondent, writing from Plano, Texas, describes as follows the manner in which a moccasin used his body as a sort of sieve in catching small fish. His snakeship was in a shallow pool abounding in minnows, and was briskly twisting and turning in all directions, giving his body as many convolutions as possible to inclose the fish or force them into narrow spaces between him and the bank. In either case the fish would endeavor to escape by leaping over the snake's body into the water beyond. Meantime the moccasin with elevated head caught the fish in his mouth as they passed through the air.