FELLING TALL CHIMNEYS.

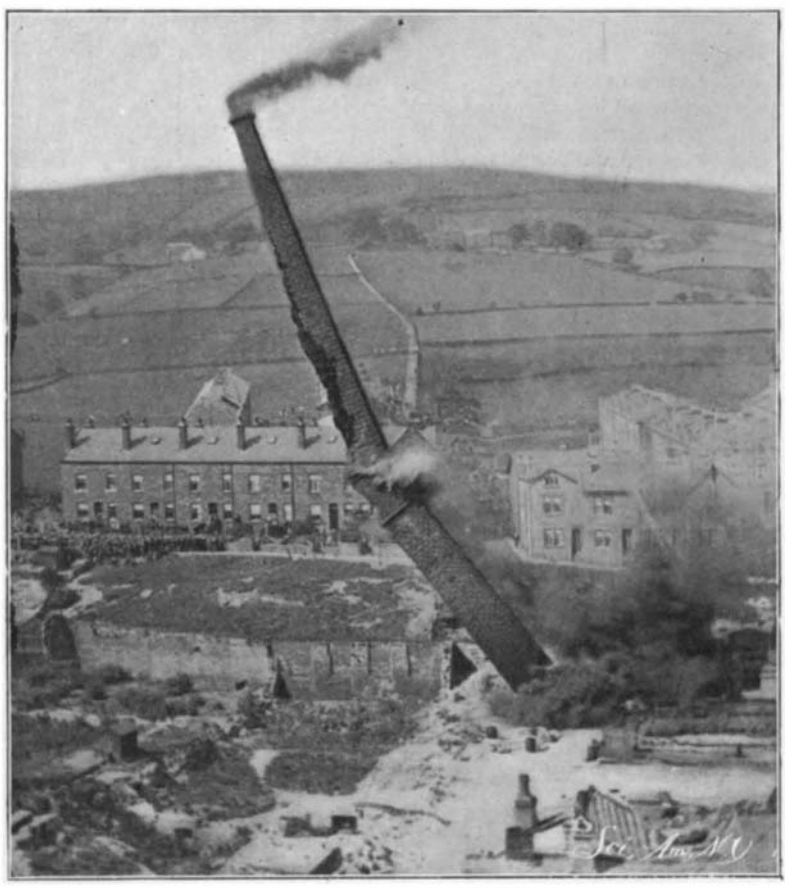
The demolition of a lofty chimney, when accomplished in the same manner as it was erected, that is, brick by brick, is a tedious, protracted, and expensive process. But in England, a much more effective, quicker, and cheaper method of bringing a chimney to the ground is in vogue. By this process, a chimney two or three hundred feet in height, that occupied several months in its erection, and which may weigh several thousand tons, is thrown down in a few days at an insignificant expenditure of labor and money. Yet nothing could be simpler than this special process of demolition. It briefly consists of removing the greater portion of the base of the chimney; substituting thick wooden underpinning for the masonry, and then firing the props, which in time burn through, with the result that the chimney collapses *en bloc*.

This method of chimney felling was devised by a Mr. James Smith, residing at Rochdale, a suburb of Manchester, who has overthrown nearly a hundred chimneys in this manner in various parts of England and the Continent of Europe, and in every case without the slightest mishap. Some of these chimneys were among the largest in existence.

In felling a chimney, the stack is first thoroughly examined and careful notes made as to its height, weight, and condition. A survey of the surroundings is then made to ascertain which is the best direction in which to overthrow the structure, and so long as the available area which is to receive the mass is a little more than the length and breadth of the stack, it is sufficient. Having determined upon the direction of the fall and the available area to receive the stack, an incision is made in the center of the chimney at a height of five or six feet from the ground, facing the direction in which it is to fall, and corresponding cuts are made on each of the sides. As the bricks are removed, an underpinning of 6 × 6 timbers is inserted, the work being carried on until about two-thirds of the base of the stack has been so treated. By this time the stack usually is listing over slightly in the direction in which it is to fall, the list being an indication that the chimney is resting almost entirely upon the underpinning. At the same time on the reverse side of the chimney there will appear a slight crack in the masonry. The underpinning is carried on until this fracture appears, for unless the greater part of the structure rests upon the supporting posts, the direction of the fall can by no means be predicted with certainty.

The gap made in the base of the stack must be of sufficient width to cause the structure to drop and telescope when falling. If only a narrow gap were made, the stack would simply pivot on its base and come down intact, measuring its length on the ground; but as it is desired to concentrate the debris, a sufficient gap is made at the base to insure that as the stack leans to its fall it will drop a few feet vertically *en masse*, the jar thus given to it causing the mass to crumble upon itself. As soon as the underpinning is complete, a fire of highly inflammable combustibles is built up, and the props are thoroughly saturated with oil and covered with pitch and tar. On the occasion of the felling of a stack at Preston, which was 250 feet in height and weighed over 3,500 tons, there was consumed in burning out the underpinning 6½ tons of coal, 4 tons of pitch, 40 sacks of shavings, 108 gallons of tar, and 126 gallons of paraffine. The burning of the props has to be most carefully watched, since it is necessary that they all collapse at the same time to insure that the chimney will fall in the desired direction.

We present illustrations of the felling of a shaft at Mytholmroyd in Lancashire, which was erected in 1833 at a cost of $5,000 and was 200 feet in height. It had been sadly damaged by the agencies of wind and weather, and sooner than repair the chimney it was decided to bring it down. It would have amply repaid any expense devoted to its renovation, however, since it proved to be one of the most solidly constructed shafts in the country. The base was square in section and measured 11 feet each way. The underpinning was a most laborious process, since it occupied no less than a fortnight's hard work. To perform the same operation on an ordinary chimney is a matter of only a few hours, so a very adequate idea may be formed of the strength and solidity of the structure. The masons experienced exceptional difficulty in removing one or two of the stones, which weighed no less than 2¼ tons each, while 16 tons of masonry in all were removed and fifty props inserted in their place. This chimney came down very quickly after the props were lighted, the fall taking place in 10½ minutes, whereas it usually takes half an hour to burn out the supports. Our photograph was secured as the chimney fell over, and it shows the shaft in the act of telescoping.



FELLING A 200-FOOT STACK BY UNDERPINNING AND BURNING.

The largest stack ever brought down by this method was one at a large paper mill at Manchester. It was no less than 270 feet in height, was octagonal in shape, and measured 90 feet in circumference at the base. More than 1,000,000 bricks were employed in its construction, 100,000 of which constituted the foundations.

BASE OF THE STACK UNDERPINNED, AND FUEL LAID READY FOR BURNING.

The total weight of the structure was nearly 4,000 tons.

The process above described is that which is always employed when the stack has a large space into which to fall, be it circular, square, or octagonal in shape. When, however, it has to fall into a more limited space, it is a much more difficult operation, since the whole of the stack has to be subverted and has to rest entirely on the wooden props. Then again the burning of the fire necessitates assiduous watching in order to insure that they all collapse simultaneously. If the operation is successful, the chimney does not topple over, but telescopes perpendicularly into a large heap over its original foundations.

Black Diamonds.

The only two regions from which black diamonds are taken seem to be the Cape of Good Hope and the province of Bahia in Brazil. The black diamonds are divided into two varieties, known as carbons and borts. The first of these is a variety of diamond which occurs in irregular crystals, having a somewhat granular structure without possessing a distinct cleavage. Its hardness is at least as great as that of the diamond, although its density is inferior on account of a slight porosity; it has a resinous luster and is grayish or black in color. The "bort," on the contrary, is somewhat spherical and does not present the irregularities shown by the "carbons;" it is grayish or black and somewhat translucent, taking the form of round masses with a rough surface or one presenting a confused crystalline structure. It is only within the last ten years that the black diamond industry in Brazil has assumed any considerable importance; it is utilized in the manufacture of rock-drills, etc. The demand is constantly increasing, and for this reason the price remains high. The region where the black diamonds are found is about one day's journey from Bahia, by boat to San Felix and by railroad to Bandeira do Mello; this is also a diamond-producing district. The most productive region is found beyond the river Paragason, about two days' journey by mule. It is probable the black diamond is to be found in all this region, but on account of the primitive methods of extraction the only places from which they are taken are the bed of the river and its tributary the San Antonio, and from the sides of the Sierra des Levras. The carbons are found in a kind of gravel consisting mainly of quartz pebbles mixed with ferruginous clay and resting on a clay stratum.

A spot is chosen in the bed of the river where it is not more than 20 feet deep and where the current is not too rapid; a long pole is planted, down which the native descends, being provided with a sack whose mouth is stretched open by an iron ring. The clay is scraped from the bed of the stream and the sack filled with gravel; it is brought up and taken to the shore, the sacks being stored out of reach of high water. This operation is carried on each day for the six months of the dry season. At the commencement of the rainy season, when the search is suspended on account of the current and the great depth of the river, the gravel is washed and examined for carbons. The divers are quite skillful and can remain under water for more than a minute and a half. The parts of the river having a great depth are not worked; here dredges or diving apparatus could be used to advantage. Another method of extraction consists in perforating the sides of the mountain along the shore, and a number of tunnels have thus been made for the extraction of gravel containing diamonds and carbons. The work is carried on during the dry season, and in the rainy season the gravel is washed in cradles or by similar methods. The carbons are found in dimensions varying from a grain of sand to crystals weighing 975 carats; the largest was discovered in 1894 and sold at Paris for 100,000 francs. The size preferred is that weighing from one to three carats, as the large masses must be broken, with considerable loss. The carbons are used principally in the construction of rock drills, being disposed on a steel crown in circles or rows; their price is naturally high, this resulting in part from the imperfect methods of extraction employed. The buyers are found chiefly at Bahia, and have representatives in the mining region; the price is variable, and averages $22 per carat.

In Vienna, telephone booths are furnished with napkins bearing the inscription, "Wipe, if you please." The napkins are changed frequently, and this undoubtedly serves to keep the mouthpieces of the transmitters in good sanitary condition.