saving of fuel is effected by the use of a variable cut-off, when the work to be done is variable. No engineer can be *posted up* in his profession unless he is acquainted with the recent improvements in cut-offs, as illustrated in this work, and as they have appeared in our own columns. Our mechanics have devoted more attention to such devices for regulating the power of engines than those of any other country; this, we believe, has been called forth by the peculiarity of American operations. We remember when it was scarcely possible to find an American steam engine that would operate so as to give uniformity of motion to machinery in a factory. Their governor's were so sluggish that, when a few machines in a factory or mill were thrown off, the engine drove the others with such fury that something was sure to break down. These defects are now almost unknown; our present steam engines—thanks to patent cut-offs and sensitive governors—operate like clockwork, and cut off the steam to do the work required—no more and no less—at every stroke. These are great improvements, truly.

In another department our machinists have made most astonishing advances during the past 20 years: namely, the manufacture of tools. We had previously attained undoubted superiority in the manufacture of tools for working wood, but not those for working in iron. We remember when it was scarcely possible to find a good American lathe, planer or gear-cutter; our best tools had to be imported from England. But all this has changed. American iron tools, as now manufactured, are of a very superior character. Some of the English tools are a little better than ours and some of ours are better than theirs, so that we stand about equal; but as our inventors are never to be beaten in anything, and as our country is more extensive than England, and our wants more numerous, we shall soon shoot further ahead. As the accurate, superior and rapid construction of machinery is dependent upon good tools, we have hailed with the utmost gratification our progress in tool-making; it is a sure sign of excellence and advancement in the arts. Several tools, as manufactured by Sellers, of Philadelphia (a distinguished maker), are illustrated by full working drawings in the work of Mr. Weissenborn.

MACAULAY'S COMPANIONS IN THE TOMB.

Baron Macaulay (says the London *Post*) now lies close at the foot of Westmacott's statue of Addison, whom he once so happily described as the unsullied statesman, the accomplished scholar, the master of pure English eloquence, the consummate painter of life and manners, and "the great satirist who alone knew how to use ridicule without abusing it; who, without inflicting a wound effected a great social reform; and who reconciled wit and virtue, after a long and disastrous separation, during which wit had been led astray by profligacy, and virtue by fanaticism." The remains of Addison, however, are at some distance from the spot on which the monument stands—they are in the chapel of Henry VII.; and it was not until three generations had laughed and wept over his pages that any tablet was raised to his memory in the Abbey. Macaulay said of the statue which now keeps watch over the newly-closed grave:—

"It represents Addison as we can conceive him, clad in his dressing-gown, and freed from his wig, stepping from the parlor at Chelsea into his trim little garden, with the account of the 'Everlasting Club,' or the 'Loves of Hilpa and Shalum,' just finished for the next day's *Spectator*, in his hand."

Thickly strewn near the grave of Macaulay, are the relics of men whose names are still held in reverence, and whose works adorn the literature of our country. As a poet, not less than a brilliant essayist, Macaulay has earned a place among the great men of the past and present; and in death the author of the "Lays of Ancient Rome" and the ballad on the "Spanish Armada" will face Thomas Campbell, who won a poet's fame by the "Pleasures of Hope." A few feet from the grave of the enobled poet of the nineteenth century stands the fine old piece of gothic sculpture which marks the resting place of Chaucer—the father of English poetry.

Just opposite to the tomb of Chaucer, "the day starre" of English poetry, is the monument of "Fairie Spenser," the sunrise of our poetry, who died, as Ben Jonson tells, "for lack of bread; refusing the twenty pieces sent him by my Lord of Essex, as he was sorry he had no time to spend them. Fairly obliterated by the hand of Time, the tomb of Spenser bears the inscription, "Here lies the body of Edmund Spenser, the prince of poets in his time, whose divine spirit needs no other witness than the works he left behind him." Beaumont, the dramatist, sleeps here too, but no memorial or inscription marks his resting-place; it is, however, immediately behind Chaucer's tomb. A marble much defaced, erected by the Countess of Dorset, bears in very illegible characters an inscription written by Ben Jonson for the tomb of Drayton. Still nearer Macaulay's grave there is a small pavement stone with the inscription, "O rare Ben Jonson!" which Aubrey tells us was done at the charge of Jack Young, who walking there when the grave was covering, gave the fellow eighteen pence to cut it. At a recent relaying of the pavement of the Abbey the original stone was removed and destroyed. A few feet distant is the monument of Cowley, raised by George, Duke of Buckingham. A monument raised by Sheffield, Duke of Buckingham, marks the grave of Dryden—"Glorious John"—who was followed to his resting-place by mourners in twenty mourning coaches, each drawn by six horses, and at whose requiem an ode of Horace was sung, with an accompaniment of trumpets and hautboys.

The only titled poet that sleeps in this part of the Abbey, is the Earl of Roscommon, the famous master-of the-horse to the Duchess of York at the Restoration. Another companion of Macaulay is Nicholas Rowe. There are also Matthew Prior and John Gay and he whose tomb bore the inscription (in imitation of that of Jonson) "O rare Sir William Davenant!" and Samuel Johnson, David Garrick, and Richard Brinsley Sheridan, and Camden, the father of English history; May, the historian of the Long Parliament: Gifford, the editor of the "Tory Quarterly Review;" Dr. Parr, and numerous others. At the opposite or north end of the transept, there towers above other memorable graves the stately monument of Chatham, of whom Macaulay wrote, and the words are now not less applicable to himself:—"Among the eminent men whose bones lie near him, scarcely one has left a more stainless, and none a more splendid name."

ANCIENT RUINS IN THE UNITED STATES.

A new stimulus is likely to be given to American archæology by a discovery recently made some 90 miles north-east of Fort Stanton, a long account of which has just appeared in the Fort Smith (Arkansas) *Times*:—

The plain upon which lie the massive relics of gorgious temples and magnificent halls, slopes gradually eastward towards the river Pecos, and is very fertile, crossed by a gurgling stream of the purest water, that not only sustains a rich vegetation, but perhaps furnished with this necessary element the thousands who once inhabited this present wilderness. The city was probably built by a warlike race, as it is quadrangular, and arranged with skill to afford the highest protection against an exterior foe, many of the buildings on the outer line being pierced with loop-holes, as though calculated for the use of weapons.

Several of the buildings are of vast size, and built of massive blocks of dark granite rock, which could only have been wrought to their present condition by a vast amount of labor. There are the ruins of two noble edifices, each presenting a front of 300 feet, made of ponderous blocks of stone; and dilapidated walls are even now 35 feet high. There are no partitions in the apex of the middle (supposed) temple, so that the room must have been vast; and there are also carvings in bas-relief and fresco work. Appearances justify the conclusion that these silent ruins could once boast of halls as gorgeously decorated by the the artists', hand as those of Thebes and Palmyra.

The buildings all have loop-holes on each side, much resembling those found in the old feudal castles of Europe designed for the use of archers. The blocks of which these edifices are composed are cemented together by a species of mortar of a bituminous character, which has such tenacity, that vast masses of wall have fallen down without the blocks being detached by the shock. We hope ere long to be favored with full and descriptive particulars, as it is probable that visits and examinations will be made among such interesting relics of the unknown past, by some of the United States officers attached to the nearest fort.

GRIST MILLS AND MILLING.

MESSRS. EDITORS:—I propose to give the readers of the SCIENTIFIC AMERICAN some practical information about milling, as I have been a working millwright for seventeen years, and have put up mills with stones varying from six down to three feet in diameter. These extremes in the sizes of stones in different mills led me to observe their relative merits during a long series of operations; and I can give a very experienced opinion of their qualities, regarding the best size of stones and the speed at which they ought to be run to do the most and best work with the least waste of power. I have attended a steam mill during the past six years; having charge of the milling and doing the mill-work. In it there are five pairs of stones—four for wheat and one for corn. The "run" for grinding corn have a speed of 150 revolutions per minute; they grind 800 lbs. per hour. The ground corn meal is carried up, by elevators, to a sieve 5 feet long and 2 feet wide, driven by a crank, with a 2-inch pitch, and it has a speed of 136 revolutions of the crank shaft. There is a small fan which blows off the light bran; the coarser meal is carried back to the eye of the stone with a small tin spout. We use No. 16 brass wire cloth in the sieve, which does very well, if attention is paid to keep it clean. The speed given to the four "run" of wheat stones is 100 revolutions per minute. We never use a hammer-pick in dressing these stones, as the French burr is liable to wear into holes. We use a plain chisel pick, one inch in breadth, which makes better work than when it is made broader. One "run" of stones grind 560 lbs. of wheat per hour, with a loss of only 4 lbs. in 280. I have given the quantities in pounds because this is the most correct method, as it is difficult to find two men who can measure alike by the bushel. These millstones are each 4 feet 8 inches in diameter. W. M.

Baltimore, Md., April 28, 1860.

EXPLOSIONS IN COAL MINES.

MESSRS. EDITORS:—In a late number of the SCIENTIFIC AMERICAN, you noticed the explosion of "fire-damp" in a coal mine, near Scranton, as corroborating your previous statement of the great exposure of life by the present poor mode of ventilation in mines. The accident referred to was not caused by insufficient ventilation; those mines, like many others in that section, are ventilated by an air passage excavated with and separated from the main tunnel by battened boards; the inner end of this passage opens into the main one, and near its mouth is a chamber containing a large fire which assists the draft and would especially consume all combustible gases. The wire rope holding the platform (on which was a loaded car hoisted almost up to the mouth of the shaft) broke and uncoupled from the drum; the platform and car of course were precipitated and carried with them parts of the structure, smashing in the side of the air passage. Impure air and gases then rushed into the tunnel and were carried, by the downward current, through the shaft into the coal chambers; an explosion was the result, wounding several, and one (it is feared) fatally. It is very unusual for an explosive gas to collect in mines ventilated in the above manner. S.

[Our correspondent states that the explosion "was not caused by insufficient ventilation," and yet it is substantially admitted that it *was*, only that if the ventilating arrangement had not met with an accident, the probability is that the explosion would not have occurred. We are well acquainted with the mode of ventilation described; it is the most simple and common, but it is a very imperfect system, as we shall clearly show. A coal mine cannot be properly ventilated unless a current of fresh air is made to flow continually through all the passages and rooms; now, as the draft through a mine, where a fire is used in the up-take shaft, depends entirely upon the size and intensity of the fire, which is seldom uniform, the ventilation can neither be uniform nor certain. For some mines this system of ventilation is sufficient, while for others, it is not.—EDS.

THE DANGER OF TATOOING.—The *Journal de Rouen* states that the medical statistics having shown that several cases of loss of limb, and even death, had occurred from the practice of tatooing so common among seamen, the maritime authorities in France have recommended the discontinuance of the practice.