

THE COMMON HORNBILL.

The common hornbill (*Tmetoceros abyssinicus*) is a strong, short-winged bird with a short tail and comparatively long legs. The beak is very large, curved slightly, flattened on the sides, and is provided with a short but quite high protuberance at the root. This protuberance begins on the center line of the beak, projects forward to about one-third of the length of the beak, and may be open or closed in part, and has the general appearance of a helmet. The legs are much more powerful than those of other hornbills and have very strong claws. The sixth feather of the wing is the longest, and the point of the wing projects only a short distance beyond the upper arm feathers. The color of the bird is absolutely black, excepting ten yellowish white feathers of the wings. The eye is dark-brown, the iris lead blue and red, and the beak is black excepting a spot on the upper beak, which is yellow in front and red in the rear. The length of the bird is about four feet. It is found in Central and Southern Africa.

The White Ant's Parasites.

At a late meeting of the Philadelphia Academy of Natural Sciences, Dr. R. S. Kenderdine exhibited specimens of the wonderful parasites found recently by Dr. Leidy in the intestines of the white ant, where they occur in such myriads as to constitute a mass greater in bulk than the food of the insect. When the intestine is ruptured millions of these living occupants escape, reminding one of the pouring out of a multitude of persons from a crowded meeting-house. So numerous are these parasites, and so varied their form, movement, and activity, that their distinctive characters cannot be seen until they become more or less widely diffused and separated.

The termites or white ants are so common, easily obtained and preserved alive, and their parasites are so exceedingly numerous and constant in their occurrence, that once the fact becomes sufficiently known the insects will be favorite subjects to illustrate at once the infinity of life and the wonders that are revealed by the microscope. The forms observed, together with a species of microscopic plant found in the same situation, are fully described and beautifully illustrated by Dr. Leidy in the forthcoming number of the Journal of the Academy.

HUMAN TREES OF INDIA.

BY DANIEL C. BEARD.

All those who feel a sufficient interest in the subject to study or notice the facts must at times be struck with amazement at the wonderful resemblance of certain insects and other animals to vegetable and inanimate objects. So exact is this resemblance in some instances as to deceive the most experienced. Wallace, the great naturalist, was very anxious to secure a specimen of a certain brilliant butterfly, but was unable for some time to capture one on account of the creature's sudden unaccountable and mysterious disappearance. He finally discovered that the outside of this insect's wings was an exact representation of a leaf. When the butterfly alighted upon a shrub and closed its wings it completely deceived even this experienced scientist. Some species of lobsters found at Bermuda so closely resemble submarine stones, even to the coating of sea weeds, that I have passed by an aquarium containing them supposing the tank to be uninhabited. The common katydid, whose constantly-repeated notes, late in summer, warn us of the approaching frosts, has a representative in South America, whose wings not only resemble a green leaf, but, to add to the deception, the tips of the wings are ragged and discolored, having the exact appearance of a leaf that has been disfigured from the attacks of caterpillars. I once had one in my studio, and it was with great difficulty that I could convince visitors that it was not an artificial insect with wings made of real leaves. In the snow-covered regions of

the North the foxes, hares, bears, and birds, with very few exceptions, assume the prevailing white color of the surrounding objects. Man has not been blind to these hints. There are various tribes of savages who successfully imitate stumps and stones by remaining immovable in crouching positions so as to baffle their pursuers.

This mimicry is carried to a wonderful degree of perfection in India. That strange country, as Dr. Latham says,

taining hand. But the most ingenious device to escape capture is that shown by the Bheel robbers in the accompanying illustration. It often happens that a band of these robbers are pursued by mounted Englishmen, and unable to reach the jungle, find themselves about to be overtaken upon one of those open plains which have been cleared by fire, the only shelter in sight being the blackened trunks or leafless branches of small trees that perished in the flames.

For men so skilled in posturing this is shelter enough. Quickly divesting themselves of their scanty clothing, they scatter it with their plunder in small piles over the plain, covering them with their round shields so that they have the appearance of lumps of earth and attract no attention. This accomplished, they snatch up a few sticks, throw their body into a contorted position, and stand or crouch immovable until their unsuspecting enemies have galloped by.

When all is safe they quickly pick up their spoil and proceed upon their way.

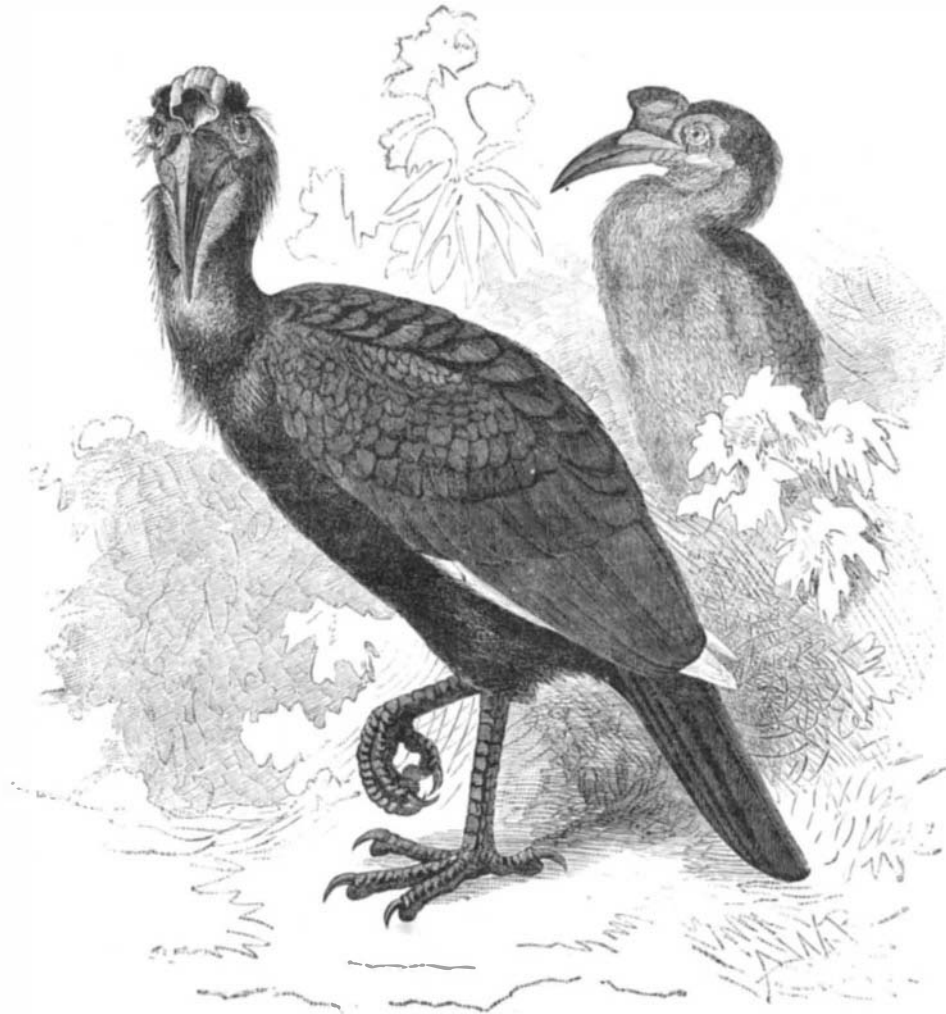
The Rev. J. D. Woods gives an interesting account of these marvelous mimics. I quote the following:

"Before the English had become used to these maneuvers, a very ludicrous incident occurred. An officer, with a party of horse, was chasing a small body of Bheel robbers, and was fast overtaking them. Suddenly the robbers ran behind a rock or some such obstacle, which hid them for a moment, and when the soldiers came up the men had mysteriously disappeared. After an unavailing search, the officer ordered his men to dismount beside a clump of scorched and withered trees; and the day being very hot, he took off his helmet and hung it on a branch by which he was standing. The branch in question turned out to be the leg of a Bheel, who burst into a scream of laughter, and flung the astonished officer to the ground. The clump of scorched trees suddenly became metamorphosed into men, and the whole party dispersed in different directions before the Englishmen could recover from their surprise, carrying with them the officer's helmet by way of trophy."

Marine Fauna of the New England Coast.

To the current number of the *American Journal of Science and Arts*, Prof. A. E. Verrill contributes an article on the remarkable marine fauna discovered during the present season off the southern coast of New England by the naturalists connected with the U. S. Fish Commission. The stations at which dredgings were made are all located in the regions designated on the charts as "Block Island Soundings," and nearly all proved to be exceedingly rich in animal life, the vast abundance of individuals of many of the species taken being almost as surprising as the great number and variety of the species themselves. Crustacea, mollusks, annelids, and echinoderms were most numerous. The very large number of specimens obtained on the three trips has, as yet, been only partially examined, but enough has already been done to prove this region to be altogether the richest and most remarkable dredging ground ever discovered on our coast. Of mollusks, about 175 species were taken, 120 of which were not before known to occur on the southern coast of New England; about 65 are additions to the American fauna, and of these about 30 are apparently undescribed species. The star-fishes and ophiurians were exceedingly abundant and beautiful at all the stations, and many species not previously known

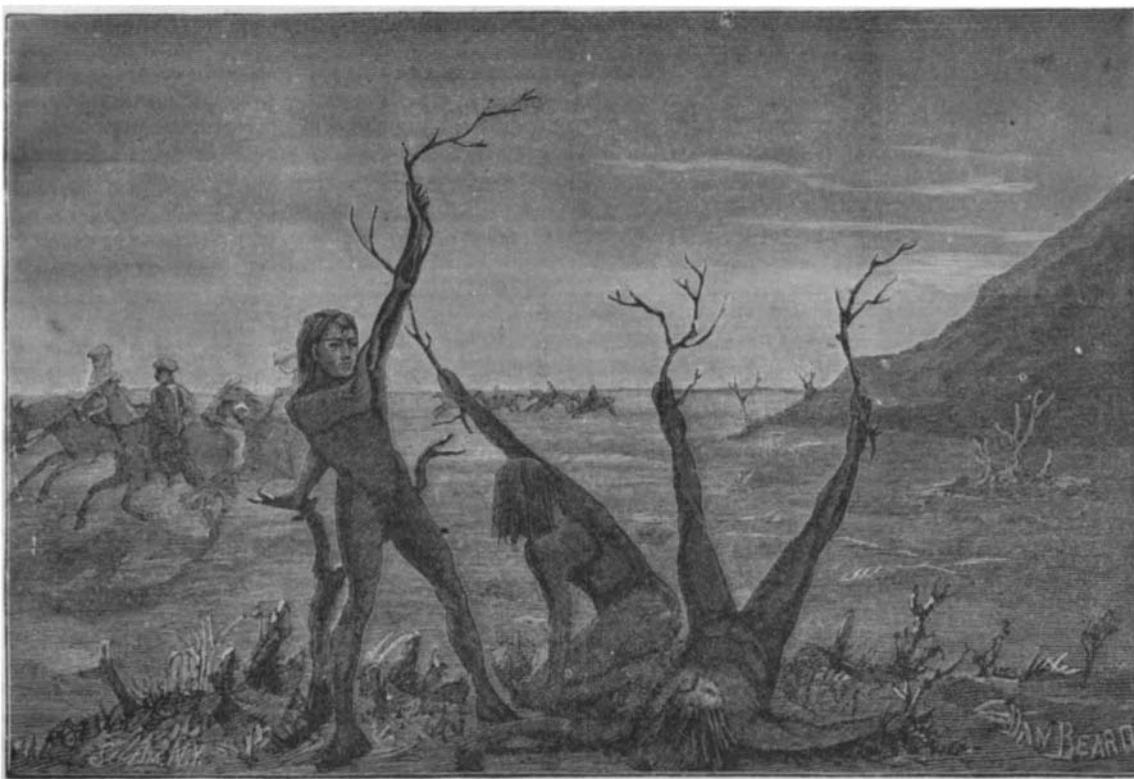
to our coast were taken, several of these appearing to be undescribed, while others were known only from Northern Europe or from the deep waters off Florida. Many of the species have only recently been obtained from the northern fishing banks off Nova Scotia. One new species of *Archaster* was particularly abundant, several thousands of specimens having been taken. But the two largest and most beautiful species of this genus were *Archaster Agassizii* (new),



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"of a teeming, ingenious, and industrious but rarely independent population. It is a country of an ancient literature and ancient architecture," and, he might have added, of a modern degradation. A country where such a society as the murderous thugs is possible; a country where robbers are educated from childhood for the profession in which they take great pride, openly boasting of their skill. One of our most skillful and adroit bank robbers would be considered by these India experts but a bungling amateur.

The scientific manner in which these robbers prepare for their raids shows a thorough knowledge of the dangers of



HUMAN TREES OF INDIA.—BHEEL ROBBERS IN HIDING.

their calling, and the best guards against the same, choosing darkness for their forays. When their dusky bodies are least observable they remove their clothes, anoint themselves with oil, and with a single weapon, a keen-edged knife suspended from their neck, creep and steal like shadows noiselessly through the darkness. If detected, their greasy and slippery bodies assist them in eluding capture, while their razor-bladed knife dexterously severs the wrist of any de-

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and *A. Flore*. Of *Odontaster hispidus* over 100 were taken. One of the most conspicuous star fishes was the remarkable *Pteraster multipes*, Sars, one specimen of which was over six inches in diameter, and very thick and heavy. Its color when living is rich purple above, with the lower side orange streaked with brown, and with large dark purple suckers. A large and handsome orange-colored species of *Luidia* (apparently *L. elegans*), often ten to fifteen inches broad, was very common, but nearly all the specimens dismembered themselves before they reached the surface. Large specimens of two Floridian sea urchins were also taken.

What Machinery has done for Agriculture.

The various agricultural shows held last autumn in different parts of the country cannot fail to impress all who visited them with the extraordinary developments made in recent years in mechanical appliances for agriculture. It is well, therefore, to notice the benefits which this industry has derived from the genius and the labors of the mechanician. We may go back in thought to the time when the spade, the hoe, the sickle, and the flail comprised the farmer's store of machinery, and when the plow was the rudest contrivance hardly worthy to be called a tool. Then every man tilled the soil or engaged in pastoral pursuits because it was all one man could do to provide himself and his dependents with food. Then each man was forced to clothe himself and be his own mechanic for this simple reason. He labored long and with infinite pains, and the ancient sentence that man should earn his bread by the sweat of his brow came home to him with unmitigated force. In course of time improved and effective tools so lightened the labors of the agriculturist, and so increased his products, that the opportunity to make a division of labor arrived, because there was food to spare for the mechanic. This condition of things became more and more firmly established, until it changed the whole social and political aspect of human affairs. And now what do we see? The true "landlord" is not the owner of an English estate, proclaims a writer in *Capital and Labor*, but the farmer who commands an army of farmers, with brigades of plows, reapers, and other machinery upon the plains of Western America. He makes laws for countries thousands of miles away, and his products rule the world's markets. The genius of agriculture to-day is the mechanic; the soul of agriculture is the inventor. One farmer can now, with the help of machinery, feed a hundred men with greater ease than at one time he could feed himself alone. The farmer supports the railroads, for stocks rise and fall with the good and indifferent reports of what the harvest shall be. He supports lines of steamers with his wonderful freights of breadstuffs, provisions, meats, cattle, and sheep. He maintains the millions of artisans who clothe and shelter him, and who provide for every one of his wants outside of the field.

The mechanical power of the age is like a series of concentric and eccentric circles, of which the farmer stands out in the principal center. These all revolve with and about agriculture, and the same force sets all in motion. It is the farmer's duty now to make the most of his opportunities. He should be the foremost man of the age. His influence should be felt everywhere. It is felt everywhere, for the wealthiest merchants and capitalists and the most active politicians all ask themselves how far the farmers can be depended upon before they make a movement in their special pursuits. But the farmer should feel this himself. It is one thing to have power, and another thing to be cognizant of the possession. Let the farmers consider now their position, and, as they take a view of it, let them consider what they owe to the power and influence of machinery. One most conspicuous example of the results pointed out may be noted. A few years ago Minnesota spring wheat was graded very low in the grain markets and brought a low price. Unfortunately for the Western farmers this grade of spring wheat was the only one they could produce. A new process in milling was introduced. Elaborate machinery was invented to perfect the process. The best wheat by this process was the grade known as "Minnesota spring," theretofore despised and rejected—literally "rejected," in fact, in the markets. Afterward this grade became sought by millers, and the value advanced to a point equal to, and sometimes more than that of the previously much-sought winter wheats. If Minnesota farmers produce forty million bushels of wheat annually, this advanced value, due to the new process, puts several millions of dollars yearly into their pockets; and what a vast amount of comfort and happiness may be secured by the right use of so much money! This is but one instance of the vast concatenation of circumstances which points the moral here alluded to.

Supposed Preventive for Carpet Beetles.

A writer in the Germantown *Telegraph* suggests that, as the larvæ of the bacon beetle (*Dermestes lardarius*), an insect closely allied to the carpet beetle, will shun their food when tallow is placed near them, their repugnance to that substance being so great that the insects will devour each other rather than approach it, the same peculiarity may be quite possibly met with in the larvæ of the carpet beetle; and if so the coating of floors and filling the cracks with tallow (the cracks being their place of concealment) would possibly prove an effective destroyer of these troublesome pests. The experiment could be easily tried. If good mutton tallow be employed there could be no hurtful absorption of the grease, especially when the carpets have linen backs.

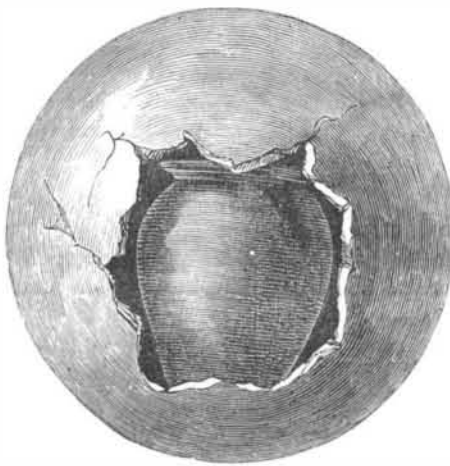
The Year.

The Egyptians, it is said, were the first who fixed the length of the year. The Roman year was introduced by Romulus, 738 B.C., and it was corrected by Numa, 713 B.C., and again by Julius Cæsar, 45 B.C., who fixed the solar year as being 365 days and 6 hours. This was denominated the Julian Style, and prevailed generally throughout the Christian world till the time of Pope Gregory XIII. The calendar of Julius Cæsar was defective in this particular, that the solar year consisted of 365 days 5 hours and 49 minutes, and not of 365 days 6 hours. This difference at the time of Gregory XIII. had amounted to 10 entire days. To obviate this error Gregory ordained in 1582 that that year should consist of 365 days only; and in 1751 it was ordered to be so used in England; and the next year 11 days were left out, the 3d of September, 1752, being reckoned as the 14th, so as to make it agree with the Gregory Calendar. The Russians still adhere to the Julian Calendar (called now *Old Style*), which is 12 days behind the reckoning of the Gregorian.

The year 1881 will be a mathematical curiosity. From right to left and left to right it reads the same. Eighteen divided by 2 gives 9 as a quotient; 81 divided by 9 gives 9; if divided by 9 the quotient contains a 9; if multiplied by 9 the product contains two 9s; 1 and 8 are 9; 8 and 1 are 9. If the 18 be placed under the 81 and added the sum is 99. If the figures be added thus, 1, 8, 8, 1, it will give 18. Reading from left to right it is 18, and 18 is two-ninths of 81. By adding, dividing, and multiplying 19s are produced, being one 9 for each year required to complete the century.

A CURIOUS GRAVE.

The practice of burning the dead was common among the ancients, and was in vogue during the first two centuries of the Christian era. In Italy, the ashes of the dead were generally buried in the ground or deposited in vaults, while among the Celtic people inhabiting Gaul and Brittany the urn was frequently inclosed in terra cotta globes and then



interred. One of these spherical graves is shown in the engraving; it was discovered near Lincoln, England, by the Rev. John Carters. The globe is roughly made of terra cotta. It has a diameter of several feet, and contains an urn, the shape of which indicates its Roman origin. As at that period Roman legions occupied England, the ashes are probably those of a soldier from the Gallic provinces. The urn is made from white clay.

Treatment of Whooping Cough in Gas Works.

According to the *Lancet*, a series of recommendations on the treatment of whooping cough in gas works has been made to the French *Académie de Médecine*. Some time ago a committee of three was appointed to investigate the subject, and of these M. Roger, the President of the Académie, is the sole survivor. He has lately presented a report which is of considerable interest. Before considering the communication, he described the arrangement of the chambers for purifying the gas, and the chemical products which patients would breathe therein. The purifying chamber is a large room with doors and windows freely open. Each contains twenty-four vessels, holding five cubic meters of depurating substance—lime and sulphate of iron, mixed with sawdust—through which the gas has to pass. When the workmen are emptying and refilling these vessels the children with whooping cough are placed around it, and inhale the vapors which escape. They are in an atmosphere containing ammonium sulphide, carbolic acid, and tarry products. As to the efficacy of the treatment, M. Commenge records 120 cases in which the treatment was persevered with. In 20 the treatment failed completely, in 48 improvement followed, and 101 were cured. M. Bertholle merely states that of 341 cases 122 were improved and 219 were cured. Failures or deaths are not mentioned. Besides the 490 cases improved there were, it appears, 671 cases not included, because the treatment was not persevered in, and these perhaps include a large number of failures. The remote situation of most gas works, and the exposure involved in the treatment in winter, must necessarily limit the application of the method. M. Roger thinks that it acts only upon one element of whooping cough—the catarrh—and that it is contra-indicated in febrile attacks of the disease, and would be dangerous in complicated cases. The method, however, is easy of use in some localities in summer, and seems worthy of further trial in suitable cases.

MISCELLANEOUS INVENTIONS.

Mr. Abraham Witmer, of Safe Harbor, Pa., has patented an improved car starter. Coiled springs are engaged by clutches operated by the wheels when the car is stopped, and the springs thus being wound up, the momentum of the car is stored up as a force to assist the subsequent starting. Means for placing this arrangement under the control of the driver or conductor of the car are provided.

Mr. Wallace H. Phelps, of Alliance, Ohio, has invented an improved drill for coal. It is a large auger provided with a peculiar screw feed and means for holding it in adjustment, and the bits or cutters are formed of S-shaped cutting knives formed with cutting edges at both ends. The shape of these knives renders them effective and durable.

A curious combination of water races with gates at different heights, water wheels, tanks, and pumps, has been patented under the title of "water power," by Mr. Robert Thamm, of Oshkosh, Wis., by which means the water can be made to act upon a single motor, or a series of motors, the water acting successively upon the motors in the order of their elevation.

A patent for a spark arrester has been granted to Messrs. Geo. Gunther, of Bath, N. Y., and William Kowalski, of Brooklyn, N. Y. The lower part of the smokestack has a jacket, and the upper part of the stack is attached to the lower part by brackets. In the upper part of the stack is placed a deflecting cone with its apex downward over the opening in the lower part. The blast is turned outwardly and downward, and a portion of it emerges through the opening between the two parts of the stack, while the sparks are retained in a space between the upper and lower parts, the lower part projecting upward into the upper part.

Mr. Jonathan Cornell, of Sandy Hill, N. Y., has patented an improvement in paper pulp washers, which washes the pulp faster than strainers constructed in the ordinary manner, and enables the operator to see into the washers to watch the progress of the work, and to clean the strainers when necessary by water discharged through a hole against the inner surface of the strainers.

Mr. Oley C. Hanson, of Eureka, Cal., has patented an improved shingle machine, in which, by a peculiarly constructed carriage for conveying the block to the saw, a novel sliding crank feed mechanism and a device for changing the lead of the saw, he secures simplicity of construction, speed, and regularity in the operation of the machine.

A rectilinear motion of sulky plows is secured in an invention patented by Mr. Samuel H. Taylor, of Kansas City, Mo. Bars with lateral slots form the connection of the plow to the sulky shaft, which permits the draught pole of the sulky to oscillate laterally without affecting the direction of the plow, which can be raised or lowered at will by the operator.

Messrs. George Biehn and Rudolph Weidauer, of Racine, Wis., have patented an improved band cutter for thrashing machines so constructed as to cut the bands rapidly and surely and deliver the grain in good condition to the feeder. The feeder is protected from being accidentally cut by the knife of the band cutter.

An improved heel for boots and shoes, patented by Jean Leycuras, of Paris, France, provides improved means for mounting the heels upon the shoe, secures increased solidity and greater rapidity in manufacture, and completely masks nails, screws, and threads. The heel is provided with a circumferential groove, and the upper leather is secured at its edge in the groove by nails driven from the outside. An overlapping edge, or strip of leather, is arranged to turn up over and mask the nail heads.

Fires in Coal Mines.

A vein near Coal Castle, Schuylkill County, has been burning for forty-five years. A huge fire was kept in a grate at the mouth of this mine to prevent the water in the gutters from freezing. One night, in 1835, the timbers of the drift caught fire, and when discovered the flames were beyond control, and the mine was abandoned. Many efforts have been made since to work the mine, as the coal was of remarkably good quality; but although it has been flooded many times, the fire continues to rage, and the intense heat makes it impossible for miners to labor even in slopes which were opened some distance from the burning vein. No vegetation grows on the surface above this pit of fire, and it is dangerous to walk across it, as many places have caved in, and there seems to be but a thin shell of earth over it. Near Mauch Chunk there is Summit Hill Mine, which has been burning for about twenty-five years, and vast sums of money have been expended in fruitless efforts to extinguish the flames.

Quillala Toothwash.

BY ALEXANDER E. BENNETT, PH.G.

An excellent toothwash containing glycerin is made as follows: R. Soap bark, ground, 4 ounces; glycerin, 3 ounces; diluted alcohol, sufficient for 2 pints; oil of gaultheria, oil of peppermint, aa 20 drops.

Macerate the soap bark in the mixture of glycerin and diluted alcohol for three or four days, and filter through a little magnesia previously triturated with the volatile oils.

Thus made, a much better preparation is obtained than by macerating the bark in the dilute alcohol, and adding the glycerin afterward.—*American Journal of Pharmacy*.