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THE HISTORY OF
ANTHRACITE COALHunter Accidentally Stumbled Upon
Some Lumps of "Stone Coal,"
But People Had Little Use For it

Coal is such a commonplace article that few people take the trouble to find out what it is and how it came into use. The average householder's thoughts about coal are mainly confined to questions of price.

One picks up, of course, such interesting facts as that the United States burns three hundred and fifty million tons a year, at a cost to consumers of about seven hundred million dollars. In this estimate all grades of anthracite and bituminous coal are included. One wonders how long the visible supply will last, and whether the men who in future generations are to take up the work begun by Edison and other experimenters will find a new source of practical heat supply in time to prevent a protracted "cold spell" when the coal gives out.

One is troubled, too, by the relations between miner and operator, and is worried when he learns that the great strike of 1902, for example, involved a total loss to workers, operators, railroads and business men of about one hundred and fifty million dollars.

But all these matters are problems of the day—mere seconds on the clock of Nature. If we look back over so brief a gap as one hundred and fifteen years, we shall see the discovery of anthracite in America.

In 1791 a hunter, named Philip Ginter, lived on the eastern slopes of the mountains which are drained by the Lehigh River. Late one afternoon he found himself at the summit of Sharp Mountain. A storm was coming up, and Ginter broke into a run, for his home was some distance away. Stumbling over the roots of a fallen tree, he kicked up a black stone, and noticed that the soil in which the tree had grown was mingled with similar specimens of an unusual formation.

Now Ginter had heard that there was "stone coal" in the mountains, so he picked up the stumbling block which had checked his course, and carried it home with him and gave it to Colonel Jacob Weiss, who lived near the site of the present Mauch Chunk. Colonel Weiss sent the specimen to Philadelphia, where it fell into the hands of Charles Cist, a printer, who recognized it as anthracite, and advised Colonel Weiss to buy the land where the coal had been found.

To get the land was easy, for the region was wild and remote from the easier connections of civilization. Col. Weiss bought from the government several thousand acres, and organized in 1792 the Lehigh Coal Mine Company. His associates included Robert Morris (the well known financier), John Nicholson, Charles Cist and J. Anthony Morris.

In May, 1792, an expedition—four laborers, with a member of the company to direct them—set out to open and work the mine. It was found that a great bed of anthracite lay quite near the surface. The company quarried several tons of the coal.

The question now was how to dispose of the product. The anthracite was there in vast quantity, ready to be pilfered from old earth; but many miles of forest and mountain separated the mine from the nearest market. Moreover, people were dubious as to the burning value of anthracite, and wood was still plentiful, and, well, like other new products, anthracite had to prove its usefulness before it would be accepted.

After a few weeks the laborers were discharged. Colonel Weiss carried lumps of coal in his saddle bags and induced a few of the blacksmiths of nearby settlements to try it; but there was no general tendency to adopt the new fuel.

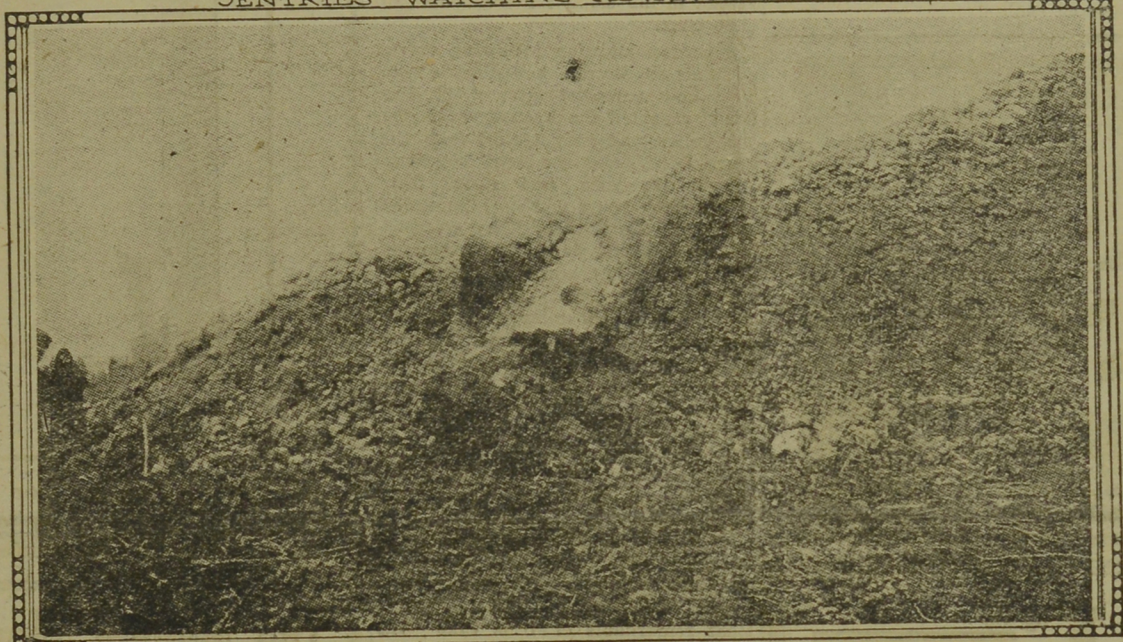
The Pennsylvania Legislature, in 1798, chartered a company to improve the navigation of the Lehigh River. The work was completed in 1802, but although the removal of obstructions and the building of wing-dams were something of an improvement, the river was still likely to prove rude to voyagers. The coal company, however, resumed its quarrying, and built a fleet of arks which during high water in the spring of 1803, were loaded with coal and sent down the stream. Four of the six arks were wrecked; two reached Philadelphia. But when the Philadelphians tried to burn the coal, they had no success with it, and the Lehigh Coal Mine Company abandoned its efforts to introduce a fuel so unlucky.

In 1810 coal was found near Pottsville, and blacksmiths used it successfully. A Philadelphia chemist, after making a careful analysis, announced that the heating power of anthracite was extraordinary. Colonel George Shoemaker, who had dug up coal on his lands near Pottsville, loaded

HOW ETNA'S SINISTER LAVA COVERS COUNTRY



SENTRIES WATCHING ADVANCING LAVA



LAVA ADVANCING IN A GREAT WALL

In the accompanying photographs of two scenes at the edges of the great lava streams thrown out from Mount Etna an excellent idea is given of what the recent terrible anxiety of the volcano means to the country over which the lava flows. In one of the views the lava is shown still giving off clouds of steam, though miles away from the crater whence it issued.

eight or ten wagons in 1817, and took the caravan to Philadelphia. Inasmuch as he guaranteed that the "stone" would burn, he succeeded in disposing of his stock; but now, as formerly, the Philadelphians failed to get any heat from their purchases—except the heat of their tempers, which led them to secure a warrant for the arrest of Colonel Shoemaker on the charge of swindling. He escaped to Pottsville by making a detour and meantime the Fairmount nail-works, which had bought several tons of the anthracite, hit accidentally upon the way to make it burn.

The proprietor and several of his men had spent a morning vainly trying to fire up a furnace with the coal. They had raked, stirred, poked and used blowers, but the stuff refused to burn. Noon came, and the men shut the furnace door and went to their dinner. When they came back they found the furnace red hot. The closed door had solved the draft problem. The way to make anthracite burn was to shut it in the furnace and let it alone.

In a few years more the coal industry became established. The Lehigh company reentered the field. They shipped 365 tons in 1820, 1,000 tons in 1821, and 2,240 in 1822. By 1830 their annual production was more than 41,000 tons; by 1840 it was 225,000 tons; by 1850, 722,000 tons. Up to 1847 the company got all its coal from its open quarry on the summit of Sharp Mountain. Boats carried the coal down the Lehigh.

To get the product from the mine to the river, a railway, nine miles long, was built in 1827. Excepting a track laid in the quarries at Quincy, Massachusetts, this was the first railway to be operated in the New World. Mules drew the cars to the summit; gravity carried them down.

The little black stone which the good people of Philadelphia rejected in 1792 has become the keystone of all our industries.

A little fellow rushed breathlessly into a drug store.

"Please, sir, some liniment and some cement."

"What?" asked the puzzled clerk. "What's the trouble?"

"Mam hit pop on the head with a plate."

If you would flatter a woman keep quiet and listen.

MR. ROOSEVELT IN PARIS

(From Punch.)

Mr. Roosevelt's tour, as it goes on fully justifies my description of it as a unique tribute to a personality which has deeply impressed the whole world, vegetable and animal, as well as human. His reception in Paris has been something pyramidal. As for the scene at the Comedie Francaise last night, it was such as I have never seen nor heard of before. The house was largely filled with students from the Latin Quarter, and between the second and the third acts of Frou-Frou loud cheering was heard. Happening to notice that Mr. Roosevelt was not in his place, I left my box and quickly hurried along the corridor. I found him making a speech to the students on the Latin genius as exemplified by the histrionic profession. One passage which struck me as singularly impressive, was the following:

"The energies of the actor, if they are continuously devoted to the realistic portrayal of mean, ignoble or undesirable characteristics cannot but react disadvantageously on his moral fibre. Contrariwise, if the actor, or actress, exclusively devotes his or her best talents to the impersonation of such characters as are only noted for their integrity, honesty and piety it is more than probable that in the long run his or her soul will be braced and toned up to a higher level of moral achievement."

The students were hypnotised by Mr. Roosevelt's vehemence, and by his sledgehammer sincerity. Strong women wept like men; several fascinating soubrettes were reduced to hysterics; and a young French nobleman, renowned for his command of English slang observed in my hearing, "Golly! What a corker!" Mr. Roosevelt wound up a speech which lasted for thirty-five minutes, and contained sixty thousand words, by a poignant and soul-shaking appeal to the students to be true to the ideals of the ancient Romans. "Rome," he said, "was not built in a day and the Latin Quarter cannot be adequately described in a quarter of an hour." As the third act of Frou-Frou was now approaching its conclusion, Mr. Roosevelt reluctantly returned to his box.

Friday morning—I have just re-

turned from witnessing one of the most beautiful and touching sights that has ever fallen to the lot of a modern journalist. I refer to the visit paid this morning by Mr. Roosevelt and his son to the Jardin des Plantes. Never since the memorable preaching of St. Francis to the birds has a great man exhibited such gracious condescension to the brute creation. In such circumstances some men would have gone armed to the teeth, but Mr. Roosevelt did not take with him even a revolver. The note of perfect friendliness towards the inmates was set at the very beginning of the proceedings when Mr. Kermit Roosevelt was lowered into the bear-pit, climbed to the top of the pole, and ate several bins with an exquisite courtesy and grace. Confidence being thus established, Mr. Roosevelt went the round of all the cages and enclosures, addressing a reassuring sentence and in some cases a pitiful and stimulating exhortation to each. What, for example, could have been happier than this genial address to the giraffe—

"Your height exposes you to great danger, for, as a witty writer has said, giants are generally their own killers. Console yourself, however with the reflection that the possessors of long necks are seldom subject to apoplexy."

Very felicitous, again, was the mode in which Mr. Roosevelt introduced his son to the oldest lion in the gardens:

"Monarch of the forest, allow me to present to you my cub Kermit." Great satisfaction was expressed in the monkey-house at the friendly admonitions which the ex-President addressed to its agile occupants:

"Some unthinking critics have compared you to man's poor relations. It is not your poverty, however, that is a legitimate object of criticism. It is your dangerous indulgence in the practice of mimicry which exposes you to the charge of a vulgar obsequiousness." Mr. Roosevelt also specially appealed to the chimpanzees to avoid excessive indulgence in tobacco and spirituous liquors.

Fred—Yes, the old gentleman will soon have another wife to support.

Henry—What? You don't mean to tell me he is going to marry another wife while your mother is alive?

Fred—No; I am going to get married.

THE HANDLING AND
USE OF GASOLINENot Such a Dangerous Commodity as is
Generally Supposed, if Only Ordinary
Care is Exercised in Using It

Considering the large number of people who handle gasoline for one purpose or another, it is surprising that so few really understand the nature of the fluid. There is but little foundation in fact for the stories of terrible gasoline explosions in automobiles and on power boats that we read in the newspapers. The carrying of large quantities of gasoline in fuel tanks is written about as though it were so much dynamite waiting for only half a chance to blow the whole outfit into atoms. It is the object of this article to show the peculiar conditions under which accidents occur, how they can be avoided, and a few general suggestions as to the people means and appliances to employ to make accidents practically impossible.

A gasoline explosion is simply a very rapid combustion causing great heat and consequent expansion of the gas resulting from the combustion. This rapid expansion is what causes the piston to be driven downward when the charge is ignited in the cylinder.

Since combustion of any substance is only possible in the presence of air or oxygen, and since gasoline contains neither, it is readily seen that it cannot be ignited in a tank, in other words in a liquid form. In order that gasoline, or in fact any liquid fuel, can be ignited, it must first be vaporized, then mixed with the proper proportion of air. Whenever air comes in contact with gasoline, the process of vaporization is set up and the gas resulting is, in general, combustible. It is not combustible, however, unless the proportions of gasoline vapor and air are within certain limits. A combustible mixture is rendered incombustible by the addition of more air, thus diluting it, or by adding more vapor, enriching it. This is readily understood when it is remembered how carefully the needle valve must be adjusted that ignition in the cylinder may result.

Gasoline is what is termed a highly volatile substance, in other words it vaporizes easily. The application of heat causes the liquid to gasify. At or below a certain temperature it remains liquid and at higher temperatures vaporization takes place. This vaporization in the presence of air is productive of a combustible mixture but when vaporization in a closed tank the gas resulting is not combustible. The application of heat alone in any quantity cannot cause an explosion. If the containing vessel be closed the application of heat might cause sufficient pressure to burst it, but so long as the vapor does not come in contact with the flame and in the presence of air, no ignition or combustion will result.

If a can of gasoline be set on a stove it will boil away as water would. Now, supposing this can to have a small vent in the top just sufficient to relieve the pressure caused by the expansion due to heating, a match applied at this opening will simply cause the issuing gas to burn just as the gas from a jet in your home. It is no more possible for the flame to enter the can than for the flame at the gas jet to run back into the pipe. This is just the condition prevailing in a gasoline tank in a boat. The atmosphere above the gasoline in the tank would, in almost no instance, contain more than a very small per centage of air. For this reason it would be next to impossible for the tank to explode. Explosion of the tank could not take place other than by flame entering and causing greater pressure than the vent could relieve or the tank

would stand. We often hear stories about fire actually running back through the gasoline pipe to the tank. This is ridiculous in the face of the foregoing statements. Simply remember that there being no air and gasoline vapor in mixture in the proper proportions, there can be no fire or explosion.

Under the most favorable conditions it takes considerable heat to cause a mixture of gasoline vapor and air to ignite. The popular story about a gasoline fire being caused by the proximity of a lighted cigar is a myth. It takes more heat than that on the end of a lighted cigar to cause ignition. To immerse the end of a lighted cigar into a dish of gasoline would have no other effect than though it were so much water. The ignition of a mixture of gasoline vapor and air requires a flame or electric spark, or red hot iron, etc.

The only danger, so far as the cigar is concerned, is due to the match which lights it.

All this goes to show that gasoline is not the terrible dangerous substance that it is generally supposed to be, when handled with reasonable precaution. The chief requirements for safety is that tanks and piping be provided of such character as to preclude the possibility of leakage. There is no danger whatever from any gasoline contained in tight tanks. The fact that gasoline vapor is heavier than air causes it to lie in the lowest places.

In case a fire should break out do not waste time by throwing water upon it. Gasoline is lighter than water and since the two liquids will not mix the gasoline will float, and throwing water upon it agitates the gasoline, causing more gas to be given off, consequently there will be more fire instead of less. Every motor boat should be provided with a good fire extinguisher so placed that it can be reached quickly. A very excellent fire extinguisher is a bottle of siphon seltzer or soda. A stream from one of them directed upon a gasoline blaze is about as effective as anything that can be used.

A source of danger in many motor boats is that of the leaking gasoline from the bottom of the carburetor. This may be due to a leaky float valve or to slopping out of the air intake while the engine is running. Any float controlled valve may at some time or other become fouled by dirt in the gasoline, preventing its seating and consequent overflow of the float chamber.

Another source of danger is that of ignition of gasoline vapor in the inlet pipe commonly known as the back firing. This is usually due to a rare mixture. Other than by too close a regulation of the needle valve, it is caused by stopped-up pipes or water in the gasoline. This is further reason for the provision of adequate means of cleaning the fuel before it is allowed to enter the long pipes leading to the carburetor. The flow of the gasoline from tank to engine is so slow that any dirt that collects in low places in pipes remains lodged there and finally closes the pipe entirely at that point. This illustrates the advisability of using strainers and funnels covered with chamois skin.

Providing that the necessary precautions are taken to prevent the accumulation of free gasoline or gasoline vapor in the boat there can be no possibility of explosion or disaster due to a gasoline fire even though a thousand gallons of it be carried.

Great damage was done by fire on the 3d inst, which gutted a large Thames-side grain warehouse in Odessa street, Rotherhithe, London, the property of John Dudin & Co.

The American element will be very prominent in London Society this season. All the social world is desirous of entertaining ex-President Roosevelt.

The latest feature of a London Free Library is that some girls have taken to trimming hats there in order to copy "models" shown in the fashion journals.

The broad new thoroughfare through the heart of the old insanitary area of Leeds will be opened in a few weeks. The scheme has been in hand a dozen years or so.

The late Mr. John Foster, worsted spinner, Bradford, left estate of the gross value of one million pounds. He left considerable sums for charitable purposes.

At a family re-union to celebrate the golden wedding of Mr. and Mrs. Arnold, of Tiptree, Essex, all the members of the family, numbering 51 were found to be total abstainers.