

The Romance of Carborundum

Harder than Diamonds. A Wonderful New Substance Born of Carbon, Salt, and Sand at a Temperature Hot as the Sun.



Edward G. Acheson, Discoverer of Carborundum

By Leigh Mitchell Hodges.

ONE day, fifteen years ago, a man named Acheson, in Monongahela City, Pa., was experimenting with an electric current.

This man was a sort of dreamer. Some folks called him a fanatic on the subject of electricity, about which comparatively little was then known. "But if he gets any pleasure out of it," they said, "let him go on."

That's what he did. And on the day referred to he took a little iron bowl, lined with carbon, and a carbon rod, and, after he had placed the rod in the bowl, he piled a mixture of carbon and clay all around it and turned on a high current to see what would happen. Then he waited patiently.

When the mass cooled, he opened the tiny furnace and found a few bright blue crystals surrounding the rod. They were so small he could barely see them, but they sparkled like diamonds and, what was more, he found they would cut glass like diamonds, too!

This man—E. G. Acheson is his name—knew a great deal about metals and all that sort of thing, but he couldn't classify these crystals. Yet he was unwilling that such pretty things should remain nameless, so he called them Carborundum.

So this, then, is the beginning of the romance of Carborundum, a substance no trace of which has ever been found in nature, and which strayed into being through accident. No, not by accident. Nothing ever happens that way.

The time had come for Carborundum; that's all.

The new substance possessed a strange fascination in the eyes of its discoverer. The iridescent crystals seemed to be the bearers of some message to him. But what was this message?

He set about to see. First he tried the making of it on a slightly larger scale, building a furnace with four bricks, and the result was an increased production. Then he studied it and tested it, and found that it was almost, if not quite, as hard as the diamond; intensely sharp and infusible at any known heat. This made him wonder if it might not be useful for the polishing of precious stones. It was foolish to think of adapting it to ordinary abrasive uses, for the world already employed emery in these, and emery could be sold profitably for 5 cents a pound, while Carborundum would cost 40 cents a carat, or \$30 a pound, and then, how did he know he could ever make so much as a pound of it?

It now sells for 10 cents a pound, and 10,000,000 pounds of it are produced annually in Niagara Falls. But this is an anticlimax.

It occurred to Mr. Acheson that jewelers paid 70 cents a carat for diamond powder with which to polish gems, and he felt sure they would like to save the 30 cents if they could. So when he had made enough of this new stuff to fill a vial that had once held sugar pills, he put the world's entire supply of Carborundum in his vest pocket and started for New York.

The first gem merchant he went to laughed a laugh that had grown rusty through constant use, and said he would try it just to show it wouldn't work. But it did work, and Acheson went back to Monongahela City with an order for ten carats at 40 cents a carat.

The Rise of an Industry.

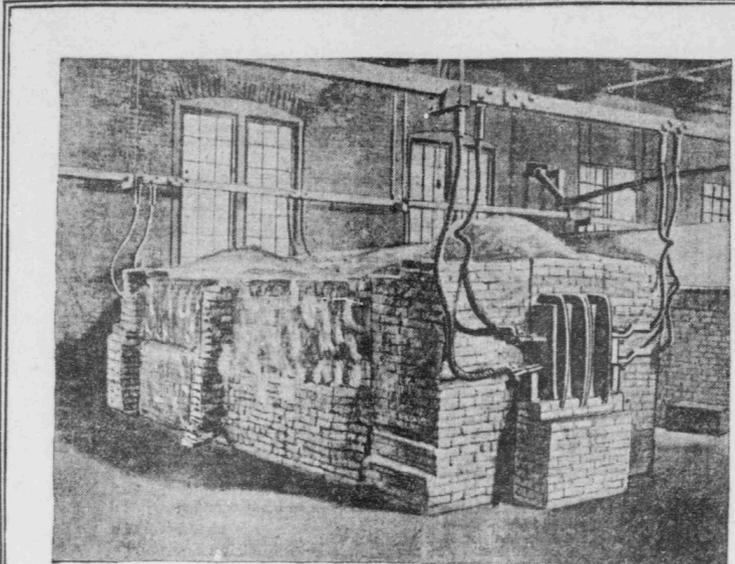
On the strength of this order he organized the Carborundum Company and built a furnace that would produce four ounces a day. These improved methods fairly swamped the market, and the price soon fell to \$110 a pound. And the supply outstripped the demand, until it was found that the operation of valve-grinding could be performed in a mere fraction of the accustomed time if Carborundum was used.

Then the price fell to \$10 a pound, and purchasers would keep one or two pound cans in their safes and weigh out the contents to the foremen as they needed it. And all of a sudden the demand passed the supply, and the company started an electric light plant and a one-car electric railway to secure a steady flow of the needed current. Carborundum seemed to have made good.

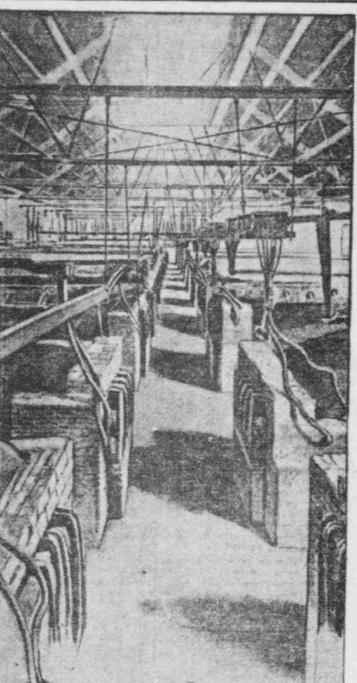
When the annual production had mounted to forty-five tons, however, the demand failed to show further increase, owing to the high cost, and the world might have suffered the loss of one of its most valuable and widely used products had not the dentists come to the rescue.

For to-day Carborundum smooths the soles of our shoes and roughs up our suede gloves, and scrapes our bones after we are dead, and in the dissecting room, and ornaments our street signs and hulls rice for our friends in India, and polishes our tombstones, and the stones we wear before we get to these, and carves our pearl buttons and sharpens our shaving knives and our razors, and keeps us from slipping down the stairs when we descend to the subway cars, and does a hundred other odd jobs of importance, in addition to its principal work done through abrasive wheels.

And it does all these things because the dentists found it would greatly facilitate their business of mouth-mining,



A Live Furnace. Heat in the Centre 7000 Degrees.



The Furnace Room in Which Carborundum is Made.

and said to the manufacturers: "Go ahead and charge us what you like. We'll take it out of our patients!" That saved the new metal to men. Dental goods were the first pressed forms into which

Novel Swindles That Entice the Gullible Rich.

THERE is no field with an inviting prospect that does not attract the swindler. He will as readily engage in a religious propaganda as conduct a poolroom if the financial results to himself promise to be satisfactory.

If he can make the credulous believe that the white pepper he sprinkles in shoes is a magic powder curing all ills and can sell the shoes for \$2,000 a pair to wealthy invalids, what need for him, he thinks, to engage in other business?

If he can import cheap paintings and palm them off as "Old Masters," if he can work off worthless mining stock in big blocks upon supposedly shrewd bank presidents; if he can jangle phantoms and assess the covetous eyes of a large family connection and, in short, if he can play upon credulity, avarice, or ignorance to the tune of a handsome living without work, then why work?

There are probably more swindlers busy to-day with ingenious and, in some cases, really unique swindles than ever before were known, and the victims seem hungrier than ever.

Only a few weeks ago an "Old Master," as it had been generally regarded, was suddenly withdrawn from the American market and shipped back to France. This, too, after negotiations had been almost completed for the sale of the painting at between \$5,000 and \$7,000.

Mystery surrounds the ownership, since it failed to change hands. The painting was supposed to have been the product of a noted Italian master whose name is widely known to the art world through his frescoes.

At any rate, it was brought to America with a considerable flourish of trumpets, held in an elaborately constructed packing case and surrounded with the precautions that are usually thrown about a treasure. Coming over in bond, it was held in the New York Custom House until the duty should be paid and the painting released.

The owner came over at the same time, lived at an expensive hotel, and entered into negotiations with a number of wealthy art patrons to dispose of the "Old Master." One such man, it is said, had virtually agreed to buy the painting.

When entered in bond the owner gave \$50,000 as its lowest valuation. At a rate of 20 per cent, the duty would have amounted to \$10,000. The was not so oppressive, if the painting could be sold for \$55,000 or \$75,000.

The glittering bubble was pricked, however, when the customs appraiser, after a careful examination, placed on the painting a valuation of only \$200. Negotiations for its sale, of course, came to an end right there, and the chagrined speculator returned to France with his "Old Master."

It is said by experts that this line of operation had originated when seemed to be a promising field. Many American collectors of paintings and art objects are greatly impressed by names—and it is easy to attribute value to names—and with means that special training; they are greatly impressed by names—and it is easy to attribute value to names—and with means that special training; they are greatly impressed by names—and it is easy to attribute value to names—and with means that special training;

The two men, it is charged by the police, rented a vacant store for a short time, borrowed some handsome and costly rugs, carpets, and other furnishings from merchants in the vicinity, and proceeded to transact business with the Cincinnati woman.

giving a check for \$500 and notes for the balance. Returning to Cincinnati, she was soon called upon by one of the men and induced to cash her own notes.

If the bold dealers had really purchased the goods from the merchants from whom they borrowed, they would have made a profit of about \$20,000. As it was, the police assert they simply returned the goods to the owners and pocketed the entire amount, minus the temporary rent of the store.

It is perhaps unnecessary to state that the widow failed to receive the goods she had paid for. The two men were arrested and lodged in jail. Later, it is stated, they compromised by returning \$30,000 of the money, and the woman refused to press the charge of swindling.

Recently a man of the same name as one in the Cincinnati case was arrested in Chicago, charged with obtaining more than \$100,000 from wealthy widows. One of the transactions was stated to be a "book venture," although its exact nature had not been revealed.

A St. Louis woman, the police said, intrusted \$50,000 to him; one in Cincinnati had \$20,000 worth of faith in a "book venture," while the widow of an Illinois brewer invested \$10,000 in a rosy dream.

What was a smooth individual who recently left a trail of rudely shaken confidence through the country about Columbus, Ind., when he never materialized, \$2,500 or more for suits of clothes that never materialized.

Having samples of goods, order blanks, and an ingratiating manner, representing himself as the agent of a well-known tailoring house, the swindler offered fine tailor-made suits for \$10, the smooth stranger did a rushing business; but he was careful to collect upon taking the order.

What proved to be the really alluring bait, however, was an offer that, if the customer would buy three suits and two dress patterns for \$50, the house would present his wife, daughter, or any one he wished a handsome tailor-made suit free of charge.

In a great number of cases the \$50 was paid, and a state fixed upon which customers were to visit the city and have their measures taken. But they never again saw their money or the clothing.

Many Mythical Estates.

One of the most extensive swindles popular just now is that dealing with a vast estate somewhere—generally "Europe"—that "rightfully belongs to your family."

The American Minister at The Hague made a report in which he has been receiving hundreds of letters recently regarding a mythical "estate" in Holland, which, he asserts, sharpers in America have been using for thirty years as a means of getting money from the credulous.

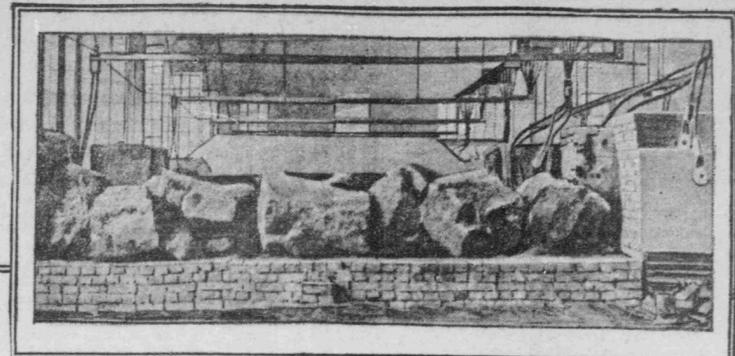
Persons supposing themselves heirs to one fortune in Holland have organized in Oregon, Colorado, Pennsylvania, Illinois, and in other states for the prosecution of their claims. The value of the property supposed to be awaiting them is variously estimated at from \$28,000,000 to \$100,000,000.

"With regard to imaginary estates in Holland," said Minister Hill, "it may be stated that as long ago as 1870 the American Minister at The Hague made a report in which the fraudulent character of publications soliciting money subscriptions from parties in the United States was fully set forth."

"The Holland 'estates' include the 'Anneke-Jans,' the 'Cronkelt,' the 'Van Cot,' the 'Van Dussen,' the 'Webber,' the 'Brandt' and the 'Metzger,' which are supposed to represent millions of money, but which actually represent nothing.

"These estates do not exist; they are myths. The 'Bank of Holland' in which thirty millions are alleged to be deposited, does not exist."

For twenty years swindlers have reaped a rich harvest



A Carborundum Furnace After Burning, Torn Apart.



(that makes you wonder if, after all, the orthodox are right about their ideas of one part of the heretofore!)

There are fifteen of these furnaces, each the height of a man and about ten by twenty feet in size. They are built loosely of brick, and after each charge taken to pieces and rebuilt for the next charge, since the intense heat often melts the bricks together. In each furnace is piled a mixture of powdered coke, fine white sand, granulated carbon, salt, and sawdust—the latter to provide vents for the escaping gas, ten tons of which is generated at each burning.

Through the center of each furnace is laid a core of carbon, around which is packed the mixture, and after the top has been rounded the electricity is applied.

The cables that carry the current from one end to another are as thick through as a strong man's wrist. They are securely connected to the furnace at either end, and a current having an energy of 2,000 horsepower is turned on. In a few hours blue flames begin to shoot out between the bricks and from fissures in the top of the mass. But there is no other evidence of the intense heat within.

The burning goes on for thirty-six hours. Then the current is turned off and the furnace allowed to cool for several hours.

Enough heat has been used in that small space to raise 14,000 gallons of water to the boiling point; to heat 1,400,000 pounds of iron red hot! Is it any wonder it produces something new and strange?

Sparkling Crystals Uncovered.

Is it any wonder that as the workmen, standing on heavy planks to keep from blistering their feet, shoved off the black covering they come presently to 14,000 pounds of sparkling crystals, shining with all the colors of the rainbow and giving out what is left over of the heat that made them for hours to come.

In big iron "burgles" the crude Carborundum is carted to the crushers. Here it is granulated by the swift revolution of ponderous wheels, and after this it is sifted. The result is a mass that might be mistaken for breakfast food but for the color. And then comes the grading. For the large thirty-six-inch abrasive wheels, which are used for grinding car wheels, the coarsest grade is used, and for razor hones the finest—it looks like black flour. All these are pressed into shape hydraulically and then fired in a kiln where white heat reigns.

And this product of such vast heat will cut anything in the world, even the surface of a diamond. It will eat its way through chilled steel as easily as you and I eat our way through a slice of home-made bread. It will put a glass on the ruby and the sapphire, and there is no acid in existence that will dissolve it. It will resist any known heat. It is the child of the greatest known heat.

Such are the properties of the substance Acheson discovered through his "fooling" fifteen years ago. Every month widens the scope in its practical use. As before enumerated, it now enters vitally into the production of an amazing number of articles, and its versatility seems in no wise exhausted.

The company is doubling its furnace capacity. The whole world is calling for Carborundum, and to spend a few hours in the shipping-room of the plant is like taking a course in geography. It is sent to every nook and corner of the earth.

And it is rather interesting to think that if the price of it had not changed in its growth from a carat product to a carload product, the value of the annual output would now be \$4,000,000,000.

Even though it does fall short of this amount by a few hundred millions, it is worth the "fooling," wasn't it?

Some Curious Facts and Fancies.

In Germany, during May, hundreds of children run about the streets without hats on when it rains, as it is generally believed that May rain is most healthy, and that when it falls on their bare heads the children will grow quicker and gain in strength.

In France a man under twenty-five years of age, whose parents are dead and whose grandfather or grandmother is alive, cannot marry without the written authority of both, or either, of them.

The natives of the Sandwich Islands estimate women by their weight. The Chinese require them to have deformed feet and black teeth. A girl must be tattooed sky-blue and wear a nose ring to satisfy a South Sea Islander. Certain African princes require their brides to have their teeth filed into the semblance of a saw.

The Japanese farewell, "sayonara," means something like "if it must be so," or "if we must part thus, so be it."

Kissing and shaking hands are rarely practiced in Japan.

That marriage is a lottery is not merely a figure of speech in the province of Smolensk, Russia; it is an actual fact. There four times every year a lottery is held, the capital prize being a young country girl, with sometimes a good dowry in sheep. The price of a ticket is about 5 cents. At a single drawing 5,000 tickets are sold. He who is fortunate enough to draw the lucky ticket has his alternative—he may marry the girl if she pleases him, also gaining thereby \$4,250. In addition to whatever the girl brings with her as dowry; or if the "prize" in question does not please him, he can turn the ticket over to a friend.

The Tartars regard onions, leeks, and garlic as perfumes. A lady of Tartary will rub a piece of freshly cut onion on her hands and over her countenance to enhance her attractions.

In Scotland it was long customary to place on a man's tombstone the symbols of his trade; and in burial grounds tombstones so ornamented are to be found. Thus, at the Abbey of Dunblane, a sugar cone may be seen as showing the grave of a grocer; an ax and a saw, with hammer and nails, occur on the grave of a carpenter; and an awl and hammer on that of a shoemaker.

Well-trained Spanish women learn to handle the sword from their earliest years, and as a result they have admirable figures and an easy walk.

In Germany what is known as a pop-wedding is occasionally celebrated, at which the bride receives her guests with a basin before her, and each person entering deposits a jewel, a silver spoon, or a piece of money in it. In some parts of Germany the rule is that the expenses of the marriage feast shall be met by each guest paying for what he eats or drinks. The price paid for viands and drinks are high, and the young couple often make a handsome profit out of their wedding, realizing a sum quite sufficient to start them nicely in life. Sometimes as many as 300 guests are present at such weddings.

Semi-nudity is common in rural Japan, and furthermore it is regarded as being respectable and healthful.

Courtship in Spain is regulated by the strictest etiquette. A young man is never left alone with his fiancée. Near Malaga a beautiful young girl of twenty has just committed suicide by drinking a cup of coffee in which phosphorus had been dissolved. It appears that the girl had been driven to the deed by the adverse comments of neighbors, who became aware that she had given her sweetheart a kiss.

Carborundum was ever made. The success which followed their introduction made possible the securing of capital with which to continue the manufacture. And, so far as human suffering is concerned, it is possible that nothing among the so-called minor adjuncts of surgery has done so much to alleviate pain as these tiny discs and points.

If he is a benefactor who causes two blades of grass to grow where but one grew before, then surely that one has some claim on human gratitude who lessens by two-thirds the time required to excavate an exquisitely sensitive tooth!

This is one of the things Carborundum has done. But just about the time it began to do this well, it was discovered that in order to continue its manufacture with any profit electricity would have to be secured for less than any one thought it ever could be got. The possibilities seemed great, but it would take the key of cheap electricity to open the door to them, and where was that key to be found?

At that crucial moment the harnessing of some of Niagara's vast power was planned and accomplished, and so when cheap electricity became a necessity, it became a fact. And the little company that had been using 150 electrical horsepower in the annual production of forty-five tons of Carborundum, only half of which was being sold, by reason of its high price, entered into a long-term contract to use and pay for 1,000 electrical horsepower in

Niagara, signing the second of all similar contracts that have ever been made, and moving its factory to the home of the cataract.

It seemed a foolish thing to do. But the fact that it was wise foolishness is attested by the further fact that 5,000 horsepower is now used in the operation of the queer-looking furnaces, in which is constantly being produced the hottest heat in all the world—a heat so hot that it makes one perspire to think of it!

Imagine, if you can, 7,000 degrees of heat! Go to an ordinary blacksmith forge and work the bellows until you have heated an iron rod to white heat and then conceive making that iron rod ten times as hot as it is, and you may be able to form some idea of the heat required to bring this remarkable substance into being.

Or if it would be any easier, conceive a slice of the sun and you will have it, for the temperature of these Carborundum furnaces is approximately that of the sun.

The workmen who take care of them call it "purple heat," and after one of them has poked a steel rod into the hellish center of a cooling furnace, and let you look into the gleaming, sizzling hole wherein a piece of fire-clay would instantly vanish in vapor and any metal be turned to gas, you feel that the term is well applied.

It is a regal sort of heat; an astounding heat; a heat that makes you wonder if, after all, the orthodox are right about their ideas of one part of the heretofore!

A Fine Scheme Foiled.

This was a case of collusion, and as a chain is no stronger than its weakest link, the entire conspiracy fell apart when one of the accused confessed.

A simple scheme it was; so simple that it puzzled the best detectives for weeks. When a merchant wished to ship a case of goods to a customer in the South, for example, and it was called for by a truckman in the plot, it was a receiver of stolen goods.

The truckman then took his bill of lading to a checker, who checked it as if the goods had been received; then it went to a clerk for his "O. K." in order to complete to dispose of to a prospective bride.

So bold did they become that they made away with entire truckloads, taking only the very best silks and woolens. The pathetic part of the story is that the clerks, in order to prevent "O. K.-ing" so many bills for missing goods themselves, forged the names of other clerks in the office, usually newcomers, and a number of these were discharged.

Mrs. Parice Chestnut Deming was recently lodged in jail at San Antonio, Tex., accused of having operated that she defrauded him of \$40,000 in the bogus sale of an imaginary tract of land in Missouri.

Another citizen of Colorado Springs asserts that she secured \$5,000 from him under promise of marriage, while the police officials alleged that the woman is an adept at dealing with marriageable old men who have property to dispose of to a prospective bride.

Sometimes the story of a novel swindle comes across the water. At Koepenick, a small town near Berlin, not long since, a robber disguised himself as a captain of the guards. Meeting a squad of soldiers in the street, he exhibited a forged order, marched them to Koepenick, where he arrested the burgomaster and treasurer and took possession of the town's cash, about \$1,000.

Leaving the soldiers to guard the town and prisoners, the bogus captain rode off with the money.

Perhaps the most curious charge, however, was made recently by a New England pastor against the officers of his congregation; it is not necessary to state the location of the church.

The reverend gentleman asserted that, when he accepted a call to the church, he believed, from an examination of the books, that the congregation numbered over 600; but, having taken up his new work, he revised the rolls, whereupon the actual membership was found to be 200. He believed that the rolls had been padded. This so discouraged and saddened him that he resigned his pastorate.