LIGHT LIKE THE SUN.

ACCIDENTAL DISCOVERY OF A WONDERFUL ILLUMINANT.

Its Manufacture Possible Wherever Coal and Lime, Its Constituents, Abound—Gas Companies Are in Control.

Experts say that the most wonderful illuminant yet invented has come from the accidental discovery of a gas from acetylene, heretofore vaguely known as a chemical compound existing in small quantities and susceptible of but limited manufacture. T. L. Wilson was trying to manufacture cheap aluminum down at his works in the little town of Spray, in North Carolina. He conceived the idea of decomposing lime and separating the metal calcium, and of thereafter bringing this calcium into contact with ordinary aluminum, or clay, by fusing them together under the influence of the heat of the electric arc.

In order to separate calcium, then, from lime, Mr. Wilson one day in the course of his experiments brought together burnt lime and finely divided or powdered carbon, in the form of coke dust. He used certain proportions of each and put the mixture between the poles of an electric arc. Intense heat resulted and the mixture was melted down. Instead of finding in his furnace, after it had cooled off, the metal calcium of which he had been in search, he discovered a hundred or two pounds of a brown crystaline compound.

Doubtless Mr. Wilson was disappointed, and this slag, this refuse from an unsuccessful experiment, was cast aside. But for an accident it might have remained in the refuse heap forever. Chance, in the shape, perhaps, of a slovenly office boy or a careless house cleaner, threw some water on this mass of brown slag. It may have been Mr. Wilson himself who hurled away the dregs of his drinking cup. At all events, he was present when a wonderful thing happened. As soon as the water touched the brown mass Mr. Wilson saw, with intense interest, that it began to fuse and sputter and crumble, evolving all the while a gas whose properties he became immediately anxious to investigate. A chemical analysis of the gas disclosed the fact that it was acetylene. A match applied to it generated at once a brilliant white light, so intense and powerful as to dim the electric arcs near by and almost to scorch the eyes.

Nature had been once more at work in her laboratory for the benefit of man. Chemical analysis of the brown mass found in the furnace, the slag or residuum, showed it to be not a mixture, as Mr. Wilson had supposed, of metallic calcium and undecomposed lime and carbon, but a positive new chemical compound of calcium and carbon, expressed in the formula of Ca. 2, C. 2. The oxides of the calcium had passed off as carbon monoxide, leaving the new product, calcium carbide. That was the brown slag.

But what marvel of science took place when that water was accidentally thrown on the mass of calcium carbide? The water was instantly decomposed, the calcium was released from its union with the carbon and reconverted into ordinary lime. The calcium carbide having thus lost its calcium, the carbon remaining was at once snapped up by the hydrogen of water, which is, of course, a compound of hydrogen and oxygen. This new compound of hydrogen and carbon was none other than this wonderful acetylene gas, whose chemical formula, C.2 H.2, indicates equal proportions of carbon and hydrogen. The exact results of the whole operation, conducted by nature, in the presence of wondering man, showed also that the contact of water and the brown mass would always produce a positive percentage of the new acetylene gas, which contains 92.5 of carbon and 7.5 of hydrogen.

The light that resulted almost blinded the eyes of the observers, but it didn't blind their intellectual vision. They realized in an instant what a marvel flamed before them.

I found Dr. J. J. Suckert, an expert in chemistry and physics, at the offices of Cowen, Dickerson & Brown recently. "Acetylene gas," he said, "represents in itself the essence of all light. All illuminating compounds, whether gas or illuminating oil, cannot evolve light without first having burnt off sufficient hydrogen and carbon to form acetylene. Now acetylene gives forth light not by reason of the incandescence of solid particles of carbon, as heretofore supposed, but, and here is the whole point, because the carbon is incandescent in a vapor form in this new gas, which, for that reason, emits a light equal in proportion to the light of the sun. In fact, this new light is sunlight, for the two show exactly the same spectroscope."

Of course, Mr. Wilson wanted to protect his discovery by patents, and he consulted, for that purpose, Edward N. Dickerson. Mr. Dickerson's father was one of the most eminent men in the country in his patent specialty. The son happened to be a member of a firm which represents many gas companies. It speedily became apparent to him and then to Mr. Wilson that these gas companies, who were and are making cheap gas by cheap processes, could make a much better gas by much simpler processes with the help of Mr. Wilson's acetylene gas as an enricher.

And when the managers of the gas companies and Mr. Wilson came face to face it did not take long to make the deal. The discovery of acetylene down in the North Carolina mountains took place in 1890, and now, in 1895, after the secret has been so well kept, it is said that the chief gas corporations of the country already control the acetylene gas rights for most of the profitable American territory. Certain it is that the Chicago Gas Company owns acetylene for the Windy City, and the new companies, to operate in the City of Philadelphia and the States of Pennsylvania respectively, have been a nine days' wonder in the Quaker City.

Of the New York company the directors are Charles F. Dietrick, who is associated with many gas companies; Baron E. J. Jerzmanowski, president of the Equitable Gas Company; Mr. Proal, secretary ann treasurer of several Western gas corporations; Captain R. S. Hayes, president of the West Shore Elevated Railroad, in Chicago, and Anthony N. Brady. This company owns the rights for the United States and South America.

The discovery of acetylene gas has released the gas-making companies of the United States, a high official said to me recently, from the power of the Standard Oil Company. That powerful monopoly, he said, would no longer be able to control gas manufacture, because water gas companies would no longer be compelled to buy and use as their raw material naphtha, which is a petroleum product. It is expected that acetylene will supplant naphtha in gas making. And acetylene can be obtained in unlimited quantities wherever coal and lime are found, for they are its only constituents. It can be seen at a glance that the materials for making acetylene can never be monopolized. Coal and lime are found in almost every State, for example, in the Union, and the gas can be made from them on the spot without the necessity of a long haul of naphtha, for example, from the petroleum fields.

Baron Jerzmanowski, who is not only a real baron but a coal and gas expert, says acetylene can be liquefied and transported to any place and used by individuals, even through their old gas pipes. He says there would be no danger of an explosion in such everyday use. A gentleman connected with him in business gave me in the Baron's presence the facts about acetylene's influence on our present gas supply systems and the reasons why gas, even with the afd of the new acetylene process, cannot be delivered to the residence of the consumer, the gas companios think, at much less cost than it is now.

"There are $70,000,000 worth of gas pipes in the streets and houses of New York city to-day," he said. "In fact, nobody could duplicate the gas pipe supply system now in use for that sum of money. When persons talk about cheap gas and wonder why the consumer has to pay so much more than the actual cost of the gas he burns, they forget that this enormous pipe system must be maintained, that men must be employed to take the indexes that metres must be bought and that books must be kept. Why, the Consolidated Gas Company of New York owns $15,000,000 worth of real estate alone! It is precisely because of what it costs to maintain this great plant and carry on the business that gas can never cost New Yorkers much less than 8c a thousand.

"Consider the reductions that have already taken place in the cost to consumers of illuminating gas. The first method of lighting American cities was by coal gas. It was the only method known then, and is even yet in use in England. In the forties this gas, made from bituminous coal, cost the user $8 per thousand in New York, the lights varying from twelve to fifteen candle power. Coal gas is made to-day in some American cities for $1.25 per thousand, the price varying according to the locality with the price of transporting raw material. Eighteen candle power gas is furnished to-day when twelve candle power was used fifty years ago.

"Then came improvements in the processes and reductions in the cost of transportation, and coal gas in New York came down to $3 per thousand. Next succeeded the discovery of petroleum, which water gas makers speedily found they could utilize, especially in its by-products. The Tessie du Motai process of making water gas was introduced in New York about twenty years ago. Marked improvement resulted. It was found that this water gas could be enriched by naphtha, a petroleum product, and that gas could be elevated in quality and reduced in price to as low as $1.25 per thousand. Twenty-six to thirty candle power gas resulted, and most of the big gas companies in the country changed from coal to water. Of course, in cities like Cincinnati, Cleveland and Pittsburg, coal gas is cheaper even to-day, because coal is so cheap; the residuum, after making the gas, being valuable as roofing tar and asphalt and in the ammoniacal liquors resulting.

"The next step in the evolution of better gas and cheaper gas for the consumer was the accidental discovery of carbide of calcium in solid masses, which in contact with water generates acetylene gas. This is the highest illuminant hydrocarbon known in chemistry. It is already an industrial product and can be made anywhere. Wherever we find power sufficient to supply the electric current requisite to the production of acetylene there we find its raw materials—coal dust and lime dust. Charles M. Dietrich, an expert and high official in several gas companies, at once saw the value of acetylene and took it up with his friends. It was he who brought it into practical use. The acetylene gas can be used to enrich water gas.

"It is not the intention of the owners of acetylene to 'wipe out' the gas companies and knock down prices, even if they could. They have in the main dealt direct with the gas companies already in existence and sold the acetylene rights to them, instead of organizing rival companies. When the electric light was brought out everybody said the old gas companies would have to go into bankruptcy, but they haven't, by any means. Dietrich foresaw that acetylene, judiciously handled, would work out similar results."

At Niagara Falls the Philadelphia company is constructing a large plant for the manufacture of calcic carbide. If the electrical furnaces there can produce the carbide in sufficient quantities to supply the demands of a large city, and on an economical basis, there can be little doubt of acetylene's future success. Scientific men agree on these points, but some are not so confident that the ends desired can be accomplished as are those interested in the Philadelphia company.

The carbide will be brought to Philadelphia in lumps, then liquefied, placed in cylinders and distributed to householders, who will connect them in their cellars with service pipes from the street mains, whence the supply of city gas is derived. No change in existing gas fixtures will be necessary, except to substitute for the five feet per hour burner a tip through which one-half a cubic foot of acetylene will flow in an hour. A one-half foot burner, with acetylene, it has been demonstrated, will give the same illumination as three ordinary five feet burners using city gas. A cylinder six inches in diameter and six feet long will hold sufficient acetylene to light an ordinary ten to thirteen room dwelling three months.

Based upon photometric tests 1,000 feet of acetylene light is equal to 12,500 feet of city gas. Rays of acetylene light are claimed to diffuse to greater extent than any other known illuminant. Under them all colors and shades are almost as accurately distinguished as in sunlight.

In a circular issued by the Acetylene Light, Heat and Power Company, of Philadelphia, these advantages are claimed for the product: "It gives more light, throws out less heat, consumes less oxygen and can be produced at much less cost than other illuminating gases. It is capable of being stored as a solid in the shape of calcic carbide, as a liquid or as a gas. It may be shipped long distances as carbide or as a compressed liquid gas manufactured from it, and in the latter state may be applied to all purposes of isolated lighting, especially as in railroad trains, street cars, carriages, bicycles, steamships or sailing vessels, street lighting, and it may be used in dwellings, stores or manufactories, its application for the latter purpose permitting the manufacture of a gas sufficiently low priced to be used for fuel or heating purposes."

When the company begins the distribution of cylinders of light throughout the city consumers will be charged 80 cents per thousand cubic feet. Philadelphians pay $1 per thousand for gas manufactured by the municipality, but promoters claim 1,000 feet of acetylene are equal to 12,500 feet of city gas.

Amputation Not In Favor.

Dr. A. Pearce Gould in his oration the other day before the Medical Society of London, alluded to the fact that amputation has become much less frequent in surgical practice. At best it is a confession of failure. "We have to admit that at times it is an inevitable step and may be a great boon to the patient, saving his life or health or freeing him from the incumbrance of a painful and useless member; but, all the same, it is a therapeutic tragedy, an irreparable disaster. Now, not so long ago, surgeons took a special interest, even a pride, in their cases of amputation. To-day, I venture to say, there are no operations in surgery that excite less enthusiasm than amputations, none which are felt to be more opposed to the whole spirit of surgical art; and a surgeon rarely approaches one without not only a certain misgiving, but a painful sense of disappointment, if not of failure. The readiness with which he resorts to amputation is recognized to be a rough working test of a surgeon's unfitness to practise his art."—London Daily News.

She Didn't Know.

"You are so late."

It was nearly 1 o'clock in the morning, and Mrs. Dimpleton looked reproachfully at her husband, who but a moment before had stealthily entered the house. Dimpleton turned quickly, and, putting his hand under his wife's chin, lifted her rueful face to his own and then put his arms around her.

"Ah, my dear," he said, softly, "do you suppose I have been happy away from you? When I met Winkleton, purely by chance, he invited me to spend the evening with him, it took a great deal of will power, I can assure you, to accept the invitation. It was only the thought of business, and that it really meant more for you in the end, that compelled me to. How unhappy I was as we bought the tickets and entered the theater! Your face was constantly before me. How I longed to tear myself away from that brilliant scene and follow the promptings of my heart! I applauded mechanically, my laugh was forced, and then at the supper, afterwards, how miserable I was! I pictured you sitting here alone without me. I—"

"But I wasn't alone," interpolated Mrs. Dimpleton.

"Not alone!" echoed her husband. "Who on earth was with you?"

His wife smiled, loftily, as she replied:

"No one has been with me, strictly speaking. Only if I had known that you were going to be so late, I would have stayed at my club half an hour longer."—Truth.

Worked the Cashier.

A good story is told of a young man, who, besides being a spendthrift, is a splendid mimic, and can imitate his father's voice to a dot. Not long ago the young man wanted, at once, some money to pay a bill, and he knew that his father would treat a request for the same with cold contempt. Waiting till he knew that his father would be away, he went to a telephone and rang up the office, calling for the cashier. The cashier answered, and when he was at the other end the young man imitated his sire's voice.

"I say, Blank, if that scapegrace son of mine comes round and asks for $100, don't give it to him. Only give him $50."

The cashier promised that he would obey the order. Not long after, the son called at the office and demanded $100. He was refused by the conscientious cashier, and, apparently in anger, the young man contented himself with the $50. When the old man reached the office there was a scene.

She Will Stand It.

Lilly—Why did you speak to that horrid fellow in the car? Weren't you afraid it would affect your standing?

Millie—Not a bit. He never offered a girl a seat in his life.

Much Alike.

"Do the twin sisters look much alike?"

"Alike? Why, each of them can tell if her hat is on straight by just looking at the other."

They Stopped Laughing.

It takes a bright woman to rebuke another woman's rudeness, a general statement well borne out by the following story:

A lady entered a railway train and took a seat in front of a newly-married couple. She was hardly seated before they began making remarks about her.

Her last year's bonnet and cloak were fully criticized, with more or less giggling on the bride's part, and there is no telling what might have come next if the lady had not put a sudden stop to the conversation by a bit of strategy.

She turned her head, noticed that the bride was considerably older than the groom, and in the smoothest of tones said:

"Madam, will you please ask your son to close the window behind you?"

The "son" closed his mouth, and the bride no longer giggled.

Why He Felt Good.

"Hallo, Bill, you seem in rare good spirits. What's made you so?"

"The boss sent me to buy half a pound of meat. On the way I dropped it in the mud, and he said I could eat it myself."