THE ENERGY IN COAL.

ITS RELATION TO THE FUTURE OF APPLIED ELECTRICITY.

Interesting Talk with an Expert Who Thinks There Is a Great Problem of Enormous Value Yet to Be Solved—The Wire Wave Current.

[Special Correspondence.]

NEW YORK, March 24.—A slender, bright eyed and dark haired lad stood some years ago upon the threshold of Harvard college prepared to begin the career of an undergraduate. It so happened that chance brought him into association with Professor Bell, the inventor of the telephone, and out of that circumstance the domain of electrical development and discovery has been greatly enlarged. This young man, J. J. Carty by name, determined to devote himself to the development of electricity as a commercial affair, and so successfully has he carried out his purpose that he is now regarded by many of the ablest electrical scientists as almost ranking with Edison and Bell, while some assert that before he has reached the prime of life he is quite likely to have distanced some of their exploits.

Carty is better known to scientific men than he is to the public. His writings have been confined almost entirely to the scientific journals, and his discoveries and inventions have been absorbed by the great commercial enterprises with which he is associated. So it happens that he is not talked of as Edison has been, and as Bell will always be, because his achievements have not been such as to attract popular attention. Mr. Carty is the executive head of that company which is putting up those wires which enable New York to talk with Chicago, Buffalo or Washington as easily as two persons can converse in the same room. He is not the executive, financial or administrative head, but he has absolute control of the mechanical and constructive department of this great enterprise, which involves millions.

Mr. Carty's researches enable him to talk with singular fascination about electrical development, and a few days ago when the writer asked him whether the popular idea that electricity is a force is a correct one, he replied, speaking with utmost charm and interest, and those things which he said cannot fail to attract attention.

He tilted back in an easy chair, lighted a cigar, and began and continued in a manner which showed thorough familiarity with the subject and great study.

"That question," he said, "is very often asked. I know that almost everybody who sees an electric motor running and driving an engine, for instance, is of opinion that electricity is a force impelling that engine, but in order to understand accurately how this machine works we have first got to know what electricity is. What is it? Who knows? We know no more about electricity than we know about gravity; even less than we know of that force which is called gravity. People are talking more about electricity, because of late years some of its manifestations have been brought in a most striking and dramatic way into their daily view, but we do not know what it is, and I think that the more scientific men study the matter the more they find themselves in fog and doubt.

"Now let me illustrate my meaning. You take a magnet, hold it in your hand and pass it up and down for a little while near a copper or iron wire. That will result in carrying a current of electricity through this wire. We know that by experiment. We can detect the electric current by delicate instruments. There is a force, a current, a something—call it by what name you will—which, by reason of the motion of the magnet near the wire, is conveyed through the wire. Now that something is electricity. But what that is no man has yet determined, and until the great problems of the universe are solved it is doubtful if any man will discover it.

"Yet the energy which passed through that wire was the energy of a moving arm which held the magnet. If the man who held the magnet did not move it up and down before the wire, then no electricity would pass through the wire, so that the energy which was communicated is human force. Now what is human force. It is simply the roast beef and bread and butter which the man has eaten for his dinner. The force of the arm is furnished by the food which a man consumes. But we can go farther back than that and ask where does the food get its force, and even a child at school will tell you that it comes from the light and heat of the sun, which enables vegetable life to thrive on the surface of the earth. Therefore the energy conveyed through the wire is traceable easily back to the sun.

"Practically in commercial affairs instead of using the human arm we use steam power. We build our boilers and make our engines and these turn the huge magnets before the wires which compose a dynamo, thereby producing a current of electricity intense or feeble according as we desire. So it is easy to see that electricity as we use it commercially is developed by steam power. Instead of using steam directly we use it to create a current of electricity, but where does the steam power come from? Of course from coal, and coal is simply carbonized vegetation containing energy which was planted in it by the sun. So that we get back to the sun again. And the best that electricians can do in speaking of this matter is to suggest that electricity is a current or medium which conveys the forces which originally came from the sun to the earth.

"People are not asking what the sunlight is, I suppose, because they are so familiar with it, and yet there is more mystery to scientific men even in the sunlight than in electricity. Perhaps it is because electricity does sensational things apparent to the naked eye, while the wonderful things which sunlight does are carried on in silence and subtlety. We see electricity cook a steak. Surgeons use it to cut out a man's tongue. It will run a train. It will kill an ox or a criminal. It will carry conversation over a wire. It will explode a mine and will cure diseases. But what is it? When we ask this question we are brought face to face with that eternal why or what. Still we have been getting some knowledge. We know that the transmission of light from the sun requires a medium, which is called ether.

"We have discovered, too, by experiment that disturbances on the sun like sunspots are recorded by delicate instruments, therefore electricity must be transmitted from the sun through this same medium, ether. We have got so far as to be able to say that electricity bears something of the relation to light that heat does. Electricity will produce heat and light. Heat will produce electricity, and so will light. I have a machine in the other room which if I light gas under it will produce an electric light or run a telephone. Now these things show the relation of heat, light and electricity and their common lineage in the sun.

"Lately scientific men have gone a little farther. They have discovered that waves of electricity are propagated at the same rate as waves of light. They differ probably only in their length and their form. This is a step further into the investigation of the subject, for it shows a closer relation between light and electricity than used to be supposed existed. Now, I should say that if a machine could be constructed that would generate electric waves with sufficient frequency, it is more than probable that this machine would emit light without heat. If such a machine is ever made, and it may be, it will be a mighty aid in the further investigation of this mysterious what.

"Everybody is familiar with the remark that 'electricity is in its infancy and that it is the coming power.' Every electrician has this statement made to him, and when I hear it now I always say: 'Well, when is it coming? Where is it coming from?' This brings me right back to the question which you first asked me. If it is the coming power it is coming from coal, because that is the cheapest form of energy which we now possess. In every given pound of coal there is a certain amount of energy or power stored there by the sun. Now the best engines are enabled to deliver at the belt only from 6 to 10 per cent. of the energy stored in coal. This may seem surprising, but it is the result of accurate tests.

"You wonder what becomes of the rest of this energy, and are of course amazed when I say that it is wasted, almost absolutely wasted. It goes off in the form of heat. You feel the heat when you enter the boiler room, and you know that much of it goes up the chimney. Now, if we can capture that waste, see how greatly it will cheapen electricity. One hundred pounds of coal will furnish the energy which it takes a ton now to furnish, and that means comfort, luxuries, pleasures for mankind which seem almost incredible. Then truly electricity will not be the coming power, but the power which has come. When I say power I mean the force which transmits the energy stored up in coal.

"It will do almost every kind of labor which now requires the physical work of men, and do it for a trifle. It will heat houses in winter and cool them in summer. It will make genuine cheap transit. And I might talk for an hour simply telling the things which this cheap electricity will do which now require the hands and arms and muscles of men to perform.

"Therefore as a commercial question the great problem for electricians is this, How to convert the energy which is in coal directly into the electric current? If this can be done we shall save the enormous wastage and do away with the intermediary steam boiler and engine. It is inconceivable the untold wealth which will follow the solution of this problem. The imagination of man is not powerful enough to conceive of those stupendous developments for the blessing and comfort of mankind which are in store for us when the energy which is in coal is converted directly into electricity."

Mr. Carty seemed himself to be impressed by the splendor of the vision of the future which he saw with his mind's eye, as he thus discoursed, so that for some moments he suspended his conversation.

At last the writer ventured to ask him if he believed that this discovery would be made in the near future. He replied that Mr. Edison had been studying the problem for many years, but how near he had approached to a solution he alone knew. Mr. Carty also said that machines had been constructed which would do it, but they were rude, unsatisfactory and in practical operation were really more expensive than the present method of using steam power as the intermediary.

"There are many persons who suppose," said Mr. Carty, "that the electric force is conveyed exactly as the force of water is upon a water wheel, but this is a great mistake. There is no physical transfer of force as is the case when water power is used. There is simply a wave current through a wire which conveys energy, but which is not itself probably energy, and one of the most marvelous things about this force is that an electric current of great intensity may be conveyed over a wire steadily for years and the finest microscope or the most delicate analysis of that wire will not reveal the slightest change in its molecular or chemical construction."

E. J. EDWARDS.

A New Dinner Table Decoration.

A new decoration for the dinner table has just been introduced in Paris. It consists of a set of flamingoes in pink enamel with jeweled eyes. The center of the festive board is arranged to represent a marsh, namely, a large looking glass imitating water is bordered by tiny wreaths, miniature rushes, lotus blossoms and water lilies, among which are poised the great, vicious looking birds, who rear their proud heads high up above the green leaves and fronds.

SENATOR A. P. GORMAN

A MAN WHO IS AMONG PRESIDENTIAL POSSIBILITIES.

Walter Wellman Says That He Has All His Life Been a Leader, Even in the Days of Boyish Sports and Enterprises.

[Special Correspondence.]

WASHINGTON, March 24.—A good deal of a presidential possibility is Senator Gorman, of Maryland. You have all been to the races, and noticed the horse who stands quietly near the fence, cool-

ARTHUR PUE GORMAN.

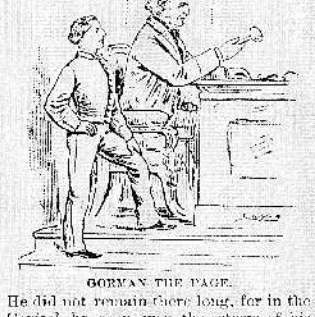
ly watching his companions frisk and jump about while waiting for the word. You have noticed also how often this quiet, steady, unassuming animal gets a good start in the race when the race is really on, and how frequently he comes at the head of the bunch to the wire.

Gorman is just that sort of a racer. As a presidential candidate he makes no noise, writes no letters, indulges in no speech making. But that he is carefully watching every possible competitor, that he sees and understands every movement of the great game, is obvious to all who know and observe the senator from Maryland. In all America there is no more shrewd, adroit public man.

The life story of this man who has come up to party leadership in the national capital and to promising presidential possibilities, is an interesting, though somewhat uneventful, one. He is of Scotch-Irish stock, from that sturdy race of Presbyterians of the north of Ireland. A little more than a century ago his grandfather, John Gorman, came to this country and settled at Harrisburg. John Gorman was a cattle trader, and eventually took up his residence in Baltimore.

There was born Peter Gorman, the father of the senator, a self reliant, hard headed man, with all the vigorous characteristics of his race. He helped build the Baltimore and Ohio railroad, and was one of the contractors who undertook the construction of the first section of that pioneer line. Arthur Pue was one of three sons born to Peter and his wife, the latter being of the well known Brown family of Anne Arundel county. Peter Gorman was active in politics and public affairs, attended national and other conventions as delegate, but never became a candidate for office. He was a warm admirer of Stephen A. Douglas, and a "Douglas Democrat."

When Arthur was thirteen years old his father secured his appointment as a page in the house of representatives.



GORMAN THE PAGE.

He did not remain there long, for in the Capitol he soon won the esteem of his father's friend, "The Little Giant," who had the boy transferred to the senate. That was in 1852, and thus, forty years ago, he who is now the leader of the Democratic side of the senate entered that chamber as a waiting lad. He made his way there, of course. Old Captain Bassett, who has governed the pages for about half a century, says Arthur Gorman was a model boy. The only fault he could find with him was that he quickly made himself the leader of the pages and had more influence over them than Captain Bassett himself.

From page, Arthur was promoted to be messenger, and then assistant doorkeeper and finally postmaster of the senate. His intimacy with Douglas continued. It was at the feet of "The Little Giant" that he learned his first lessons in statesmanship. He acted for some time as Douglas' private secretary, and lived in the senator's family. When Douglas went out to Illinois to have his great debate with Lincoln, young Gorman accompanied him. He naturally became imbued with the spirit of his chief, and on his return to his duties in the senate engaged in his first legislative battle. It was the fight over the Kansas-Nebraska bill, and the Douglas Democrats depended upon Gorman as their "whip" to manage the voting strength of the friends of the bill, and by alertness, physical endurance, tact and caution to defeat the filibustering tactics of the opposition.

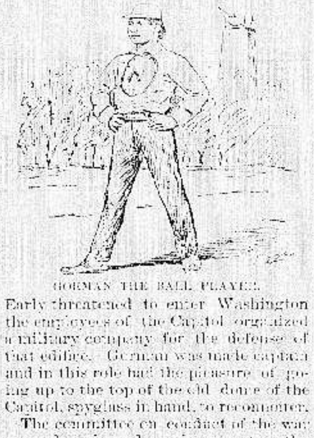
In this school of politics and statesmanship the young man proved himself an apt pupil. It is not surprising, since he was educated in the senate, that he became an adept in the practical side of public life. He was early taught to sit in the chamber not as a dreamer but as one who was expected to work and bring results. That lesson he has never forgotten. The page who acted as "whip" for the Douglas Democrats in the memorable Kansas-Nebraska struggle became the senatorial leader who directed the opposition to the federal election bill in the equally memorable conflict which took place in the last congress.

Much of his prominence and popularity Senator Gorman owes to his success in that struggle. Whether or not the so called "force bill" should have been passed is no business of ours; but for the fact, the skill, the untiring diplomacy and masterful leadership displayed by Gorman in that battle, Republicans and Democrats alike express the highest admiration. His party was in minority and yet it carried the day. Senators on his own side became jealous and balky, and gave the leader almost as much trouble as the enemy.

Yet Gorman never lost his temper; that placid face was never ruffled with a frown. "My dear senator," he would say to one of his Democratic colleagues, who was disposed to balk on him, "I hear you have been looking up such and such a question. It is a good point, and it ought to be elaborated. Don't let any one else do it; do it yourself. You are the only man who can show it up as it deserves to be. Make one of your great speeches and it will help the cause immeasurably."

Of course the senator who was thus appealed to forgot his envy, left off his balking and made the great speech. This is how Gorman kept his own men in line, and up to the high pitch of combativeness required by the nature of the struggle. How he managed the other side, his friends, the Republicans, without whose help he could not win, is secret history. But the upshot of it all was success, an honorable success, and throughout all Dixie there is not a Democrat on whose tongue the name of Gorman is not spoken with affection and gratitude.

To go back to the early days, young Gorman held his postmastership of the senate all through the war, though the senate soon became Republican. His natural gravitation toward leadership showed itself in many ways. When



GORMAN THE BALL PLAYER.

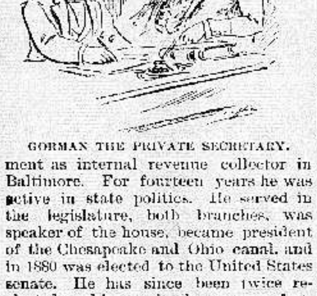
Early threatened to enter Washington the employees of the Capitol organized a military company for the defense of that edifice. Gorman was made captain and in this role had the pleasure of going up to the top of the old dome of the Capitol, spyglass in hand, to reconnoiter.

The committee on conduct of the war wanted a shrewd, active, trustworthy young man to hunt up information for them, and Gorman filled the bill. On one occasion he was sent to General Grant's headquarters near Petersburg and witnessed the great mine explosion which occurred before that city.

About 1863 a baseball craze ran over the country. In Washington was organized the National club, which soon became famous. It used to play in the lot in the rear of the White House, near the then half finished Washington monument. There was no grand stand, but chairs were brought out from the treasury, the war and state departments and the executive mansion, and placed on the sward. The president, cabinet senators and congressmen witnessed the games, and enthusiasm ran high.

Among the best of the players, one who was "all round," though he generally played right field, was Arthur Gorman. He became captain of the club, and when the Nationals started off on a triumphant tour of the country Gorman was their general manager. They whipped every club that opposed them, and their progress through the country was the occasion of an ovation. Not until they reached Chicago were they compelled to lower their banner in defeat. There they were beaten by an unknown club of country boys from Rockford, Ills., whose pitcher was A. G. Spalding, soon afterward a great professional player, and now one of the biggest baseball men in the country.

Young Gorman was finally ousted from the postmastership of the senate, though against the protest of Ben Wade and other Republicans. He was then active in the organization of the Conservative party in Maryland—an outgrowth of Douglas Democracy—and Republican senators secured his appoint-



GORMAN THE PRIVATE SECRETARY.

ment as internal revenue collector in Baltimore. For fourteen years he was active in state politics. He served in the legislature, both branches, was speaker of the house, became president of the Chesapeake and Ohio canal, and in 1880 was elected to the United States senate. He has since been twice reelected, and is now in the very comfortable position of having a seat in the senate assured him till the close of this century. A year hence, if he be not elected president, he will enter his third term in the senate, which does not expire till March 3, 1899.

WALTER WELLMAN.

He Won After a Hard Fight.

The chairman of the London school board has almost arbitrary power over the interests of more than half a million children, and Rev. Joseph R. Diggle is the man. He got there the other day at the end of a fight which for heat, bitterness and persistence would have amazed a New York Democrat or an Indiana Republican.

REV. J. R. DIGGLE.

Nearly all the teachers were against him because he is severe and favors low salaries. All the dissenting clergy opposed him because of his high church proclivities, and the liquor interests fought him frantically because he is notorious for radical temperance views. Nevertheless he got there. The Gladstonian caucus decided in his favor and put all that party's machinery to work for him. The "economy dodge," as they call it in England, was "played for all it was worth," as they say in America, and so the Rev. Diggle won. Now the Gladstonians claim this as a test of their strength for the approaching general election.

Even Corn Husks Are Valuable.

The fates are combining to make things pleasanter for the western farmer, the latest discovery of value to him being that the husks of corn will make excellent paper. Hitherto husks have not had any commercial value, and have only been eaten by stock under protest and during hard spells. Now, however, the establishment of paper mills in the west should put a stop to the constant shipping of paper from the east, and also convert a waste article into what manufacturers would call a "residuary profit," such as coke in a gas factory. It is not many years since old rags were looked upon as the only possible raw material for the manufacture of paper, and the course from cast off shoddy to the covering of corncobs has been both steady and interesting.—Interview in St. Louis Globe-Democrat.

Went Out Unattended.

Considerable surprise was caused the other morning in the southern quarters of Berlin by the presence of the emperor and two of his little sons in one of the streets leading to the military drill ground in the Hasenheide. His majesty had been desirous of witnessing shooting practice by the troops of the Berlin garrison, and left the palace quite unattended, proceeding on foot to the drill ground with his two boys, each of whom he held by the hand.

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Notice of Final Proof.

LAND OFFICE AT HELENA, Mont., March 19, 1892.

NOTICE is hereby given that the following-named settler has filed notice of his intention to make final proof in support of his claim, and that said proof will be made before Register and Receiver at Helena, Mont., on May 4, 1892, viz.:

WILLIAM H. MURPHY,

who made Homestead Application, No. 3387, for the SE¼ sec. 8, twp. 14 n, range 11 w.

He names the following witnesses to prove his continuous residence upon and cultivation of, said land, viz:

William Ohensorge, Albert Lindukee, of Ovando, Mont.; William Kutchell, James O. Gara, of Helmville, Mont.

S. A. SWIGGETT, Register.

First publication March 26, 1892. 85-43

PROPOSALS FOR CAVALRY HORSES. Office Chief Quartermaster, Department of Dakota, St. Paul, Minn., March 25, 1892. SEALED PROPOSALS, in triplicate, subject to the usual conditions, will be received at this office until 11 o'clock a. m., Monday, April 25, 1892, at which time and place they will be opened in the presence of bidders, for furnishing this Department with Seventy-six Cavalry Horses. Bids for a less number will be entertained. Blank forms of proposals and full instructions to bidders may be had on application to this office. The government reserves the right to reject any or all bids. JOHN V. FUREY, Quartermaster, U. S. A., Chief Quartermaster. 85-46

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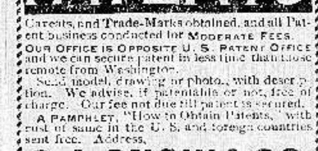

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