THE FIELD OF ELECTRICITY

Present Development of Long Distance Transmission of Energy.

ELECTRICAL POWER ON STEAM RAILROADS

Sparrows as Electricians—Application of Electricity to Turntables, Rheumatism and Diamond Making—Farm Telephones.

Notwithstanding the fact that several articles have appeared in print quite recently—some of them in technical periodicals—tending to convey the impression that the application of electric power to steam railway conditions is now merely a matter of engineering, the Philadelphia Record reiterates with emphasis the statement that "it would be wise to remember that, as yet, this problem has not been solved, and long distance electric traction is, therefore, today an impracticable scheme."

This is a subject of so much interest and importance to the public that such a positive negation would not be made were it not well fortified by facts. While it is not within the limits of practicability to give the scientific and economic reasons in detail for this conclusion, says the Record, we may say, in a word, that the cost of transferring electrical energy (not "power," as it is generally incorrectly termed), increases enormously as the distance increases. In this respect the laws of electrical transmission may be said to resemble the laws of light in that light decreases in intensity as the square of the distance.

Electrical energy for power purposes is now conveyed for a distance of thirty-six miles from a generating station in the Ogden canyon in Utah to Salt Lake City, and this is the longest commercial transmission yet perfected. A contract has recently been signed by the General Electric company and the Southern California Power company to transmit 4,000-horse power of electrical energy a distance of eighty miles, from Santa Ana canyon to Los Angeles and Pasadena. A tremendous water pressure is here obtainable by conveying the water into a pipe line, which will have the equivalent of a vertical fall of 700 feet, and the water will impinge upon impact wheels, of which there will be, at the first installation, four of 1,000-horse power each. The electrical pressure on the cable (33,000 volts) will be the highest ever attempted, and it will be reduced, of course, to a practicable working pressure at the place of utilization by the intervention of "step-down transformers."

This is the latest advance—and a great step it is—in the conveying of electrical energy for power purposes over long distance, and the question may naturally be asked: If it be practicable to convey 4,000 horse-power, why is it not practicable to utilize the same energy for running trains between these terminal points? Perhaps the electrical experts who have proclaimed the practicability of the application of electricity to steam railway service will answer this question. It may be admitted that the problem of economical distribution of electric energy for power purposes to a point eighty miles away from the source, and to intermediate places, has been solved, but this does not necessarily mean that electricity is in the present state of the art practically applicable to operating trains such a distance.

The truth is, concludes the Record, that trolley lines are operated upon an entirely different principle, and no safe comparison can be deduced therefrom.

SPARROWS AS ELECTRICIANS.

All the telephones were out of order, relates the Chicago Record. When Mr. Smith rang up Mr. Brown he was quite as likely to get Mr. Peters or Mr. Snooks, and sometimes the instrument merely buzzed and clicked and sizzled. The managers of the telephone company were at their wits' end; they had looked high and low to find where the wires were crossed, but all to no avail. At last a lineman was sent out to follow the wires from pole to pole and not to stop until he had seen every foot of the line. All one day he tramped up and down the dusty streets of the little town, in which this happened, and he could find nothing out of order.

At last, just as it was coming 6 o'clock, he reached a big building which was used as a college library and museum. Up about twenty feet from the ground a stout timber protruded from the wall to the distance of about three feet, and along the top of this the wires ran into the building. The lineman could see nothing wrong, and he was tempted to go home without making any closer examination. But he was a careful workman, and so he climbed up to the timber. As he put his head over the edge he started back suddenly. With a cry of fright and a great fluttering of wings a sparrow flew off her nest and darted in wildering circles about the lineman's head.

The nest had been built—just on top of the timber and covered both of the wires. The lineman pulled it down carefully and found, woven in and out with strings and bits of twine, a small copper wire. This was placed at the bottom of the nest in such a way that it lay across all the wires and connected them. It is possible that the sparrows wanted to experiment a little with electricity in the laboratory at the basement of their home, or they might have discovered an improved method of building nests—with copper girders. The lineman stripped away the first bundle of the nest, and now Mr. Brown can talk with Mr. Smith without getting tangled up with Mr. Peters.

MAKING DIAMONDS.

Prof. Crookes prophesies that within five years we shall be busying ourselves with the making of diamonds. The gems in a microscopic form can actually be made now, and the process is no secret. Moissan has described it fully. Pure iron is packed in a carbon crucible with pure charcoal from sugar. Half a pound of this iron is put into the body of an electric furnace, and a powerful arc, absorbing about 100 horse-power, is formed close above it between carbon poles. The iron rapidly melts and saturates itself with carbon. After a few minutes heating at an intensely high temperature, the current is stopped, and the fiery crucible is plunged into cold water until it cools below a red heat. Iron increases in volume from the moment of solidifying from the liquid to the solid state. The expansion of the inner liquid in solidifying produces an enormous pressure, under stress of which the dissolved carbon separates out in a transparent, dense, crystalline form. This is the diamond. The largest diamond yet produced in this way is only one-twenty-fifth of an inch in diameter, and some scientists are of the opinion that it will be much more than five years hence before large enough diamonds can be produced artificially to pay for the making. A foremost savant says: "Nature—that arrhobestist of the universe—starts with a molten world, invests it with a crust of solid rock, and then, through the mounds of years, waits while those mighty stresses and strains are at work, deep below, which have produced her precious gems. So great have been the forces at work, that even the great crust of solid rock has been forced up into mighty mountain ranges, and fissures, faults, and precipices bear witness to the gigantic forces that have been at play. Man, her puny imitator, having discovered her method, thinks he, too, will make gems. By the expenditure of a large amount of electrical energy he repeats the process, not with a molten world poised in space, but with a half pound of iron in a small pot; and the modern, unscientific world is astonished, not that any diamonds at all should thus be formed, but that they should be 'so very small.'"

ELECTRIC TURNTABLE.

Several large electrical manufacturers report a sudden demand for electric locomotive turntables, which are found to very quickly repay the cost of installation. One of these, which was recently installed on the St. Paul railway, can, when loaded with a 100-ton locomotive and tender, be turned in forty-five seconds. When unloaded it can make one complete revolution, including starting, in thirty seconds. The cost of fuel for each turning is 1 cents. Not less important is the saving effected in time. On the round house table 174 locomotives are regularly turned in the twenty-four hours, or about seven per hour, and the gain of a few minutes in each operation results quite a reduction in the daily expense. Formerly, when the table was turned by hand, four men were required, and the average time occupied by them at each turning was twenty minutes. The entire 174 turnings, therefore, necessitated the labor of fifty-nine hours and, at 15½ cents per hour, the cost of operating was $9.17½ per day. With the introduction of the electric motor the labor force was reduced to one man, day and night, or twenty-four hours, making a saving of thirty-five hours, or $4.37 per day in labor alone.

ELECTRIC LIGHT IN RHEUMATISM.

It is possible that the story recently circulated of the cure of rheumatism in Russia by means of the arc light should be regarded more as a welcome addition to existing data on the physiological qualities of the electric light than as an authoritative record of standard practice. The therapeutic effects of both natural and artificial light are not little understood, and there is no doubt but that their study will previously open out a new world of curative possibilities. It seems that Dr. Kouliewski, a St. Petersburg physician, was led to the treatment of rheumatism and neuralgia by experiments made by Dr. Ewald, the medical officer to some large iron works. Dr. Ewald stated he had noticed that since the introduction of the system of electric welding there had been a notable diminution in the number of cases of rheumatism, neuralgia, migraine and other nervous diseases among the workmen, which he attributed to the beneficial effect of the electric light. In order to put the matter to a test, Dr. Kouliewski fitted up his consulting rooms with an electric plant, including a powerful arc lamp with reflector. He puts the patient at a distance of five feet from the light, protected by blue spectacles and also by a screen of cardboard, in which an aperture is cut to allow the light to fall on the affected region of the body. To this it is exposed for from three-quarters of a minute to two minutes. At the time the patient feels a slight sensation of heat, though the temperature is never raised more than four degrees Fahrenheit where the light falls on the skin. No further inconvenience is noticed until six or eight hours afterward, when itching and tingling are felt and the skin becomes reddened. Some forty-eight hours later a peeling off of the skin occurs, which lasts for two or three days. In three months Dr. Kouliewski treated thirty-eight patients, varying in age from 11 to 70 years, by this system. There were eight cases of sciatica, all of which recovered; four of neuritis (locality not stated), two of which recovered; eighteen of chronic rheumatism, fourteen of which recovered, and three of lumbago, all of which recovered. In most cases three or four sittings produced an amelioration of the pain. They were continued at intervals of three or four days, according to the amount of cutaneous irritation, but the total number of sittings never exceeded a dozen. The results given correspond in some respects with those attained by a corresponding use of the incandescent light in this country. The inside of a cabinet is thickly studded with incandescent electric lamps, whose light is intensified by glass mirrors placed in the spaces between the lamps. Vigorous perspiration is induced very quickly, and the heat given off appears to be much more penetrating and more effective in its action than that of Turkish, Russian, vapor and ordinary hot-air baths. The light is said to act as a tonic and sedative as well as an alterative. Strange to say, it was adopted by its extremely limited following as preferable to the arc light, which had been experimented with and found too powerful when brought into proximity to the human skin.

CURRENT TAP.

A simple device for tapping current has been invented, which is very useful wherever the incandescent electric current is employed for lighting purposes. It enables light or power to be transmitted to any point desired without interference with the lamp at the point where the current is tapped. That is to say, wherever there is an incandescent lamp in circuit, the current can be carried to a drop light or a fan motor, and the lamp will go on burning. Many offices are supplied with only one or two single wall brackets, and if a drop light or a fan motor is wanted, current can only be procured by substituting a socket plug for a lamp, the use of which is, of course, lost for the time being. The current tap is very useful in the sick room, where only one lamp may be installed and current may be needed for heating food or liquid or other purposes; and it gives the physician a collateral supply should he bring a portable hand lamp for diagnostic illumination. It is also found of the utmost service in factories and work rooms, where a good light is needed directly over an object somewhat removed from the lamp bracket, while the light of the bracket itself is maintained.

FARM TELEPHONES.

Twelve months ago there were comparatively few farm telephone lines in the country, but as the telephone itself has been cheapening, the farmers have become alive to its value. The state of Illinois has been especially active in the establishment of these rural lines. The system is simply and substantially constructed, each farmer contributing poles and work is hauling and setting poles and an experienced man has charge of the placing of the instruments, which range in price from $10 to $16. One system in the state embraces nearly 100 instruments, with two central stations. The farmers are delighted with the result of their own enterprise, as they say they can order anything from a spool of thread to a harvest hand without moving outside their door. Merchants of the different towns connected with the system hire delivery wagons to deliver such goods as have been ordered, at regular periods, the mail being taken around at the same time. In one district, the farmers find their eighteen-mile long telephone line of untold convenience. They are enabled to order boxes for transportation, and supplies, with a few words spoken over the wire, whereas formerly they were compelled to send a messenger across country.

OLD-TIME SWEETNESS GONE.

Molasses Now Made Into Rum and Brown Sugar Can't be Bought.

"The old-fashion molasses is rapidly disappearing as an article of commerce," said a prominent grocer, according to the Eastport (Me.) Sentinel, "and in its place have come a number of sirups, which are more costly and by no means as satisfactory, especially to the little ones, who delight, as we did when we were young, in having 'lasses on their bread. Most of the molasses goes into the distilleries, where it is made into rum, for which, notwithstanding the efforts of our temperance workers, the demand is constantly on the increase, especially in the New England states and for the export trade. The regular drinker of rum will take to other liquors in its place if he can help it. It seems to reach the spot more directly than any other drink. The darker brown sugars have also disappeared, and they are not likely to return, owing to the methods of boiling and the manufacture. Granulated sugar is of the same composition, as far as saccharine qualities are concerned, at first, cut-loaf cube and crushed, and differs from them only in that its crystals do not cohere. This is because it is constantly stirred during the process of crystallization. The lighter brown sugars taste sweeter than the white, for the reason that there is some molasses in them. Housekeepers have difficulty in these days in finding coarse, dark sugars, which are always preferred for use in putting up sweet pickles, making cakes and similar ones. As they cannot get brown sugar any more, it may be well for them to remember that they can simulate brown sugar by adding a teaspoonful of molasses to each quarter of a pound of the white granulated sugar. This combination does as well for all household receipts that call for brown sugar as the article itself, and besides it saves them a great deal of hunting for brown sugar, which, as said before, has disappeared from the market."

Natural Death.

Chicago Post: When the police arrived they immediately asked:

"Was his death a natural one?"

"Certainly," replied the companion who was with him at the time he died.

Then a brief examination was made, and one of the men exclaimed:

"Here's a bullet wound!"

"Quite right," was the reply. "I had to shoot him."

"But you said his death was a natural one," they protested.

"Well, wasn't it natural that he should die under those circumstances?"

WHERE HUGE EMPIRES MEET

The British-Indian Ramparts Along the Roof of the World.

SCENE OF BRITAIN'S LATEST "LITTLE WAR"

Characteristics of the Tribesmen of the Hills—A Possible Remnant of the Lost Tribes of Israel—The Pamirs.

The scene of Britain's latest "little war" is a suggestive one, both reminiscent and foreboding. Chitral lies in the very shadow of the mighty wall of the Hindoo Koush, relates the New York Tribune, and properly pertains to that Afghan realm which was the military part of the old Empire of Irak. It was in Seistan that Saum, the Pehlevan of Nerimad, dwelt and ruled, and his mighter son, Zal, and his grandson, Rustem, the mightiest of all. It was the boast of the latter that he bore a sword and mace of Cabul. The latter "dread city * * * set at the mountain's scarped feet," lies just over the range from Chitral. Just to the south lies Swat, whose picturesque entitled ruler gave to the world one of its most familiar horseshoe questions. Beyond Swat lies the Khyber Pass, in whose name resides more than a half century of stirring Indo-Afghan history. Then if to them are added the indubitably Semitic features, names and rites of the mountain tribesmen, the Abrahams, Isaacs and Jacobs which make up their nomenclature, the tales of Canaan and of the Persian exile which throng their familiar legends, suggestions of romance are borne back to some of the most impressive eras of recorded time.

All borderlands seem turbulent. Perhaps the little buffer state is doomed to be ground to powder between the giant neighbors. But a hard flint pebble may do much mischief to the upper and nether millstones. Chitral and Swat and Waziristan and Kafiristan are properly a borderland between India and Afghanistan, and naturally belong to the latter. But Afghanistan is but the neighbor India dreads. Slowly but surely Russia has been making her way to the "Roof of the World," and now from the desolate heights of the Pamirs she looks, or is supposed to be looking, with longing eyes toward the fertile Indus valley. Wakhan, Roshan and Shiwah and other minor states lie at her feet, and then the long slopes of the Hindoo Koush and India. These hillside states must form the British vantage-ground on which to make the stand, if it ever must be made, against the northern foe.

RIVALS IN CHITRAL.

Chitral, indeed, is the one border state which touches the Russian frontier and also the Chinese. It is the apex of the British Indian wedge, driven to the heart of the continent, into the spheres of two other imperial wedges driven home to the same goal. The Russian advance first drew attention to it, or something more than mere attention. Captain Younghusband, traveling in that region, suddenly came upon a Russian military force under the famous pioneer of conquest, Captain Grombchevsky, or his colaborer, Captain Yonoff. The latter had actually come through the passes of the Hindoo Koush and advanced down the slopes. On meeting the British party the Russians made a mighty show of innocence, as though merely traveling for health and pleasure, and so by an easy circuit moved back to their own land.

But the incident set Simla and Calcutta to thinking and Downing street as well. Chitral was closely watched. Every murder of a mehtar was taken into account. And when a series of such tragedies made the throne secure, unstable, and the habit of Jandol planned to compass it, and the amees of Afghanistan prepared to seize both Chitral and Jandol and Russia was deemed ready to seize them all, the gods of chance as they are begin to consider the things that are to be. A British force was sent to Chitral, to make a permanent garrison and keep the throne secure. A highway was opened up from Peshawar, up which the loyal legions of the Sikhs and Punjabis could hasten, should need be, to guard the passes. And a subsidy was settled on the mehtar, thus making him a vassal of the British Indian empire.

So stands the case today, the present structure being no more than a protest of the more utterly Chitralis against the British comfortably. And so it comes that once more

The silver-throated clarion blows
Across the Pathan's ready fen,
And the high steeps of Indian snows
Shake to the tread of armed men.

But it is and will be only a "little war." The masses of the tribesmen of the hills are loyal to the British, under constraint of circumstances, if not through heartfelt love. They are all Pathans, save the nondescript Kafirs, and have the well known characteristics of the Pathan race. The old story that they are Greeks descended from a colony planted by "Macedonia's Madman," is to be dismissed. Some traces of Greek forms, in implements and weapons, may be discovered; but of Greek types of body, face or mind not one.

More plausible by far is the self-cherished legend of Hebrew origin. The Semitic type is unmistakably evident. They call themselves Children of Israel. They observe many of the peculiar rites of the Mosaic law. They keep the Passover. They keep the Year of Jubilee, with its release of debtors and redistribution of the land. They wear the Hebrew garb of the Israelites. Their names are echoes from the roll call of the Pentateuch. Apes of Mahometanism have obliterated many Hebrew practices, and made they as fanatically loyal to the prophet as any tribe in Islam. Yet he who studies them can scarcely doubt the truthfulness of their boast, "We have Abraham for our father."

AMONG THE PATHANS.

The Pathan type is distinctly different from that of any other Hindoo nationality. You can pick a Pathan out in a Hindoo crowd, unhesitatingly and unerringly. He is big and bony. He walks with a long, easy stride that seems slow, but covers the ground swiftly. His cheek bones are prominent, his lips full, his nose aquiline. His skin is swarthy, but not brown like that of the Hindoos further south. As the men grow old, especially among the well-to-do classes, they dye their beards a bright red, in order that the grayness of age may not be visible. Many of them have naturally fair hair and beards and light blue eyes. In their clothing blue and white are the most common color, and both are mingled in the turban. Long jackets and cloaks are worn, and in cool weather a sheepskin robe covers both, the wool being inside and the leather outside, adorned with elaborate silk embroidery. At such times a leather skull cap, or sometimes a leather helmet, coming down over the ears, is worn instead of the turban.

The women commonly dress in red and blue, wearing trousers and a long cloak with which they cover their faces when meeting strangers. The men are universally armed with long, straight Afghan knives, with ivory handles. Another common weapon is the "jezail," which is an enormously long musket with a carved and ornate stock, and a slender rod to support the muzzle while firing. The sword commonly used is the common talwar or Turkish scimitar. In addition to these a great variety of weapons of all kinds of European makes are to be found among them.

The Pathans of the hills are chiefly an agricultural and pastoral people. They cultivate wheat, rice and sugarcane in the valleys, depending almost exclusively upon irrigation, though perhaps once in five years it is possible to obtain good crops from land that is not irrigated. Sheep, goats and cows make up the bulk of their live stock, though they also use camels and donkeys as beasts of burden. Their trade with India and Afghanistan is conducted by means of caravans made up of camels, mules and donkeys. Sometimes a single caravan will contain from 300 to 400 camels laden with skins, grain and other merchandise. These trains have to be guarded by numerous armed men to secure them protection against the countless outlaws that infest the region.

THE ROOF OF THE WORLD.

Just over the mountain wall from Chitral lies the vast, lone and desolate plain of the Pamirs. "Going northeastward from Wakhan, where dwell stout warriors and good hunters, and traveling by a road which ascends for three whole days together, you come to an exceedingly high mountain, than which there is said to be none higher in the world. Here also between two mountains is a great lake, and running over the plain is a very fine river. The plain is twelve days' journey in length, and is called Pamere. Onward the road leads to Kashgar, which is tributary to the Great Khan." Such was Marco Polo's account of the "Roof of the World," and it follows well with all that know today of that forbidding region. Captain Younghusband, previously mentioned, has described it as about 130 miles by 150 miles in extent. It is a region of broad valleys, each three or four miles wide. Most of the country, to have, but parts of it in the summer yield good grass, on which the Kirghis nomads pasture their flocks the "wandering Kirghizes, who come to shaggy ponies from Pamere." Besides the valleys there are huge bare mountains rising more than 20,000 feet above the sea, while the bottoms of the valleys are at an altitude of from 12,000 to 15,000 feet. Winter begins in August and ends in May, and the temperature is often from 15 to 20 degrees below zero. The latter "half" of June and the first two weeks in July contain the only really warm weather. Heavy frosts begin with the first of August.

The only resident population of the Pamirs are the wandering Kirghis. Of these there are in the whole region not more than 100 families, with five or six persons to a family. They live in tents, and for their living depend entirely upon their flocks. They come down from the mountains to the nearest towns occasionally to buy flour and grain, and to sell their cattle and hides. As a rule, they are well clad and robust, prosperous-looking men. A few of them carry firearms, which they use for shooting game for food. They are a friendly, amiable people, well disposed toward the British, but regard the Chinese as the real lords of the world. In religion they are Mahometans. They have no temples or mosques, but pray at sunset, looking toward the west.

Such are Chitral and its neighbors, among the most remote and inaccessible of lands, yet among the most jealously regarded of all. The two greatest and most aggressive of the world's empires there meet, perhaps to clash, perhaps to dwell in amity. It would be a dreadful region for a great war. Yet who would have chosen the Virginia Wilderness for a battlefield? The exigencies of empire make strange campaigns, and it may be that the "lonely Himalayan height, gray pillar of the Indian sky," may some time see another Arbela or Waterloo. If so, there will be, thanks to the genius of more than one, but of none more than of Field Marshal Lord "Bobs," no lack of preparation for it in the southeastern slopes of the Hindoo Koush.

THE FARMER AND GOOD ROADS.

Practical Systems Now at Work in New York and New Jersey.

With all the advance of thought in the direction of better highways, says the Motocycle, there are still many who believe that their cost must necessarily fall upon the agriculturist. Just as the farmer was the pioneer settler in most of the states, so he has been the pioneer road builder. At his town meetings he has determined where new roads should be laid out, which of them should be "worked" and improved and how much of a tax should be expended upon each improvement. As it was left to him to plan the important work, so its expense has rested almost entirely upon his shoulders. Now that the cry for macadamized highways is to be heard in the city and country alike, farmers believe, as a rule, that they are to be called upon to build them.

This is wrong. Farmers have enough in the way of taxes to pay without shouldering the building of elaborate gravel and stone roads. It is unfair that such a burden should be added to their already heavy load. Whatever may be undertaken in the way of constructing permanent highways, should be done at the expense of those who are to reap its benefits. True it is that the saving in the cost of hauling crops would be considerable, and that this saving would result almost entirely to the farmer. But that is no reason for asking him to pay the cost of building such roads. He is not the only one to use them. They serve to bring city people and city products into the country as much as they serve to bring country people and country products into the city. The merchant who has business with the farmer is as much benefited through a good road to travel over as is the farmer who wishes to drive on business of any kind. Neither is the use of roads limited to those living in the vicinity and travelers from a distance share the benefits resulting from their improvement. It would be the height of injustice, therefore, to ask the farmer alone to stand the cost of good roads.

The proper division of the cost of good roads has been accomplished through state aid. This is the system by which the stone roads of New Jersey have been built. The farmers in that state are so enthusiastically favorable to the extension of the state aid system that it deserves to be described. In the first place, under the workings of the state aid system, no improvement is undertaken except upon the petition of those residing upon the road to be improved. When such a petition has been duly signed it is presented to the county board, who proceed to have the necessary drawings and specifications made. These are then presented to the state highway commissioner for approval. Upon their return by the state commissioner to the county officers they proceed to advertise for proposals to build the road. When the contracts are let a copy of each contract must be filed with the state commissioner, who thereupon appoints a supervisor of construction, upon the recommendation of the property holders, who have petitioned for the improvement. This supervisor must give his whole time to the work, and see that the conditions of the specifications and contract are carried out.

Under this state aid system the cost of improvement is divided between the state, the county and the adjoining property, the state paying one-third, the owners of the property adjoining the improvement paying one-tenth and the county paying the remainder.

The bill introduced in the New York legislature by Senator Higbie provides for a similar state aid system of road building except that the proportion of the expense borne by the state is raised to one-half of the total cost. This bill is the result of numerous conferences between Mr. Isaac B. Potter of the League of American Wheelmen and representatives of the various farmers' organizations in New York state, and will have the generous support of both farmers and wheelmen.

This system of building improved roads is highly popular, because no work is undertaken except upon the petition of those to be benefited. At the same time the cost of the improvement is not required to be borne by the farmers, and those of them whose land borders upon the road where the work is done are required to pay only a small share of its cost. The rest of the expense is shared by city and country property owners, because county taxes are assessed in the cities as well as in the country, and because state taxes are shared by every one in the state, according to the amount of property he owns, including the wealthy manufacturers, railway and insurance companies. As most of the wealth of the state is to be found in the cities, the New Jersey system successfully brings about the construction of improved gravel or stone roads without laying their entire cost upon the farmers, and without requiring them to contribute more than an equitable share of the expense according to the wealth of each individual taxpayer. The state aid system successfully answers the objection still made by many, that we cannot have good roads without overloading the farmers with taxes, of which he is already paying more than his share.

Indiana Woman Farmer.

Mrs. Adelaide E. Sherry of West Point, Ind., is the owner and manager of one of the largest farms in the Hoosier state. She is a young widow of versatile capabilities. Her farm of 1,000 acres lies ten miles south of Lafayette and nine miles north of the celebrated Buffalo Badger springs. Two hundred walnut trees of fifty years' growth rise from a lawn of four acres surrounding the handsome buildings, giving the estate its name, "Walnut Lodge." Mrs. Sherry hires and directs her large corps of assistants, indoors and out, entertains generously, drives over the estate daily, buys pigs and calves, ships Percheron horses to Germany, cattle and hogs to Chicago, cribs annually an average of 10,000 bushels of corn, travels extensively and writes for publications. Mrs. Sherry has lately returned from a sojourn in the holy land, and, "after basking in Egypt," she purposes investigating occult philosophy among the Mahatmas in their mountain abodes in India.

STUCK ON HYMEN'S HALTERS

A Chicago Man's Extraordinary Talent in the Matrimonial Line.

AT LEAST SIX WIVES TO HIS CREDIT

Maintained Three Domestic Establishments on a Salary of Sixty Dollars a Month—A Remarkable Achievement.

One of the suburban pals of Chicago shifters at the present time a man of conversible note. He is not one of the busy kind, who achieves prominence by wealth of tongue, nor does his present fame rest on public services—political philanthropist, hero or otherwise. His chief and sole claim to public attention is based on the fact that during his thirty-eight years of life he accumulated six living wives, and maintained three of them in separate establishments in Chicago on a salary of $60 per month. That fact alone demonstrates the extraordinary matrimonial talent of the man. The details of his career, related by the press of Chicago, forms an interesting revised version of old Bluebeard.

The name of the matrimonial wonder is David E. Bates. He was born in Michigan thirty-eight years ago. He is a psychological puzzle. He is a dull, uninteresting, homely, thin-faced, angular specimen of humanity of the commonplace type. In the slang of the street he would be called a "lobster." Yet he induced at least six women to marry him, and has been in correspondence with scores of others, who have expressed in their letters the warmest affection for him.

LIST OF WIVES.

These are the women whose claim to Bates as husband were presented to the police:

Mrs. Bates, formerly Miss Julia McCarthy, married in Chicago three years ago, recognized by the prisoner as his true wife and dwelling at 640 West Sixty-first street.

Mrs. Gates, formerly Miss Nettie Swain, married February 25, 1897, in Chicago and residing at 6402 Bishop street.

Mrs. Bates, formerly Miss Anna E. Herbert, Plainwell, Mich.; a sister of the brother's wife; married September 11, 1889, and now in Michigan.

Mrs. Bates, formerly Miss Nellie Howard of Kalamazoo, Mich.; married in 1886 and divorced two years later.

Mrs. Bates, formerly Miss Ida Calderwood of Galesburg, Ill., who dwelt at 5401 Dearborn street, where she gave birth to a baby. Her home is not now known to the police.

Mrs. Gates, whose identity is a mystery, but known to have dwelt at Forty-third and Wallace streets, where a child was born.

A Wisconsin sheriff believes that Bates is really Austin O. Craven, who is under indictment at Waupaca, Wis., for the abduction of pretty 15-year-old Olive Vannett some months ago. Her photograph was found in his coat. It is suggested by the police that this girl may have been the sixth wife. The sheriff will try to identify the prisoner.

He kept three and possibly four establishments in Chicago at the same time, though he was only getting $60 a month as night clerk for the Union Stock Yard and Transit company. He fell heavily into debt. This was the only matter that troubled him. He had finally determined to get rid of all his wives by starting for Alaska on the day he was arrested.

HAPPY FAMILIES.

Bates had three wives within a few blocks in Englewood at the same time. He visited them nearly every day, yet none of them suspected he was living a triple life until a few days ago. When he wanted a vacation he invented a story that his mother in Ypsilanti, Mich., was sick. He did this several times, so that he could spend a few days with each wife without interruption. Nevertheless, he was married to four women, three of whom were in Chicago, he was corresponding with other women in different towns and states.

Bates is calm, and believes he is a fascinating fellow. His success among women has been such as to foster his belief, though some he has deceived assail him with harsh names. To the three wives in Englewood he is known as a whispering bushelt, never speaking loudly, always ready to wake out of sleep lest his pockets should be investigated, always considerate and always smooth. He carried incriminatory evidence in his pockets or kept it in his desk at his office in the stock yards. He was too calm to destroy letters as soon as received, and these letters are now to be turned against him.

Bates seems to have overcome the problem of economics in matrimony, but the way he managed to support four wives on $60 a month and visit them all daily in the small hours between work and slumber has not yet been worked out.

Last month Bates' grocery account with the general store of the Stock Yards company, for which he worked, was $37.80, and that for the month his cash receipts amounted to only $2.50. Rents must be figured somewhere. Receipts and bills from various stores found in the man's possession show that he bought and rented immoderately in dry goods, jewelry and furniture. Lieutenant Shippy figures that it would more than consume the husband's balance of salary paying street car fare riding daily among the miscellaneous residences.

HOW DID HE DO IT?

"How did you do it?" asked a detective of the prisoner after wrestling half an hour with the problem.

"That is something for you older married men to study over," said Bates, backing his worried look long enough to smile faintly.

"I do not see how this man overcame the difficulties of time," said Sergeant Shaake, and Lieutenant Shippy: "You see, he worked all night as clerk at the stock yards and necessarily he had to sleep most of the day. Yet he found time to oscillate between at least four places and there seems to have been no complaint that he was not an average husband in attention at each of them."

"One of his days would probably run about this way. Work all night at the stock yards; sleep and breakfast at his main home, 820 West Sixty-first street; a jaunt north so as to spend a while at 5401 Dearborn street, winding up at Forty-third and Wallace streets, where a child was born.

A Wisconsin sheriff believes that Bates is really Austin O. Craven, who is under indictment at Waupaca, Wis., for the abduction of pretty 15-year-old Olive Vannett some months ago. Her photograph was found in his coat. It is suggested by the police that this girl may have been the sixth wife. The sheriff will try to identify the prisoner.

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Besides accomplishing the feat of maintaining two wives in Englewood within a few blocks of each other without any complications by alternating on Mr. Bates and Mr. Gates, the husband made a record by walking to hymen's altar with one bride, while another wife was dreaming of her sick baby next door. With only thirty feet separating the wedding party from the child's sick bed Bates took the vows of fidelity to his latest wife, while the cries of his baby might have been heard above the voice of the clergyman. That was when he married Miss Nettie Swain in February at the home of her father, Duncan E. Swain, 6404 Wright avenue, while Mrs. Bates, nee Miss Julia McCarthy, was temporarily at the home of her parents next door.

AS A LETTER WRITER.

When Bates was arrested a large bundle of letters was found in his possession, nearly all of which were from women in various parts of Michigan, Wisconsin and Illinois. Some were couched in loving terms, while in others the alleged bigamist was reproached for inconstancy, but all gave evidence of intimacy on the part of the writer.

In contrast with these epistles were letters from lawyers regarding divorce proceedings in which women with whom he had contracted matrimonial alliances were interested.

There was a profusion of marriage notices clipped from newspapers in which Bates figured as bridegroom. His career for several years seems to have been one in which marriage was made a specialty.

"There is something singularly pathetic about Gates' or Bates' case, says the Chicago Record." This young man was without any doubt the most successful young husband in the world, and that he should encounter an irreparable matrimonial disaster by reason of the very success with which he surmounted the difficulties of matrimony is one of the bitterest ironies of fate.

"On a modest salary of $60 a month and with only a little leisure at his disposal the young mimic maintained four wives in the same neighborhood in comfort and contentment.

"That simple statement of his achievements sounds stupendous, miraculous, impossible. Yet it is according to the testimony of the wives and the police. Bates, or Gates, worked eight hours a day and slept eight. He had, therefore, just 56 cents and two hours per day to devote to each household. Yet each household was a bower of love and peace. By mathematical calculation he had six hours of time every day, aside from that taken by his work and sleep, to account for to each wife. Yet every one of them loved him.

"Bates, or Gates, was a wonder, a wizard. To devote such a man to breaking stone and putting house on barrels would be the most wanton and criminal of wastes."

MCKINLEY'S POSTMAN.

The President Remembers the Man Who Carried His Mail in Canton.

The man who for seven years has delivered the mail to President McKinley's residence in Canton, O., was in the city, says the Indianapolis Sentinel, and received instructions from Postoffice Inspector Fletcher which will enable him to assume the role of district inspector. He received his appointment to this position as a gift from the president on July 1. Today he and Mr. Fletcher will make a tour embracing several postoffices in Ohio.

Mr. Owens is a firm-looking, solidly built man of perhaps 35 years of age. In a conversation he related some interesting facts about the prodigious amount of campaign mail which the president got last summer.

"Bill Smith," said the anti-caucuser, "was larger before his nomination than after, but it held up marvelously all the way along. His letters would number 1,000 a day, although the average was somewhat below that. As for pulpers—well, you know how the like. They seemed to come from every newspaper publisher in the country, and the amount of letters and papers together was sometimes so prodigious large that it seemed that all the mail dropped off at Canton was for Mr. McKinley. Those letters of no consequence the most valuable superscriptions. The effort of a great many of the writers was to get the candidate's signature. All at once I noticed that the number of registered letters was increasing largely. This kept up for several days, until the presidential candidate got sighting the receipts and turned them over to his secretary for him to sign. That ended the flood of registered letters. Too see a receipt accompanies every registered letter to be sent back to the sender, and these letters were merely a dodge to get Mr. McKinley's signature. I carried every piece of mail that the president got during the campaign, and did it without complaint and carried one regular route besides. In order to do this I had to make extra trips to the McKinley home every day, but I lived only a block away and it was not much trouble to do it. It required five and six trips a day to deliver the mail."

Arnold's Bromo Cascry cures headache. 10, 25 and 50 cents. All druggists.

BEECHAM'S PILLS

For Bilious and Nervous Disorders such as Wind and Pain in the Stomach, Sick Headache, Giddiness, Fullness and Swelling after meals, Dizziness and Drowsiness, Cold Chills, Flushings of Heat, Loss of Appetite, Shortness of Breath, Costiveness, Blotches on the Skin, Disturbed Sleep, Frightful Dreams, and all Nervous and Trembling Sensations, &c., when these symptoms are caused by constipation, as most of them are, THE FIRST DOSE WILL GIVE RELIEF IN TWENTY MINUTES. This is no fiction. Every sufferer is earnestly invited to try one box of these Pills, and they will be acknowledged to be

A WONDERFUL MEDICINE.

BEECHAM'S PILLS, taken as directed, will quickly restore females to complete health. They promptly remove obstructions or irregularities of the system. For a

WEAK STOMACH, IMPAIRED DIGESTION, DISORDERED LIVER

they act like magic—a few doses will work wonders upon the Vital Organs; strengthening the muscular system, restoring the long-lost complexion, bringing back the keen edge