Women in Japan.

Peculiar Treatment of Wives and Sisters—Their Social Position Is Inferior, but They Bear Their Full Share of Burdens — How the Soil Is Cultivated.

Miyanoshita, Japan, Sept. 16.—The workingmen of Japan have no reason to complain that the women do not carry their half of the load. Whatever may be the position of the gentler sex in the household, although she is not allowed to hold property, or share in the responsibilities that are usually divided between husbands and wives in America, she is at least permitted to an equality with man when there is any hard work to be done. Wherever you go, in the cities or villages, or the farming communities, you find the wife and mother working side by side with the husband and sons, plowing, planting, and reaping, and at sunset taking home a large portion of the harvest in a big basket on her back. Whenever you see a man between a pair of tiny shafts tugging to haul a heavily loaded cart up a hill, there is always a woman pushing from behind, bareheaded, barefooted, except for a pair of straw sandals, and wearing a pair of blue cotton leggings like tights from her waist to her ankles. Sometimes the baby is playing with a few rude toys on top of the load. Sometimes he is strapped to her shoulders, and his head drops from one side to the other with every motion of the body until you fear it may fall off.

You find women standing knee deep in the rice paddys, which are a thick mush of water, soil and manure, preparing the ground for the seed, and then, when the green shoots appear above the surface, they wade in again to separate and transplant the little bunches of grain. You can scarcely pass through a field without finding a woman weeding; you cannot travel a country road in the morning without meeting hundreds of them with heavy bamboo packs loaded with vegetables and other farm products on their way to market; and while woman may be satisfied with her assignments, it seems to me that the men give her all the back-breaking work to do.

There is very little difference between the dress of the sexes in the agricultural districts, and as you go farther into the interior it becomes less, until you find the farmer and his wife and their sons and daughters wearing exactly similar apparel, and very little of it, so that you can scarcely distinguish them, except by their hair.

Silk and tea, the two chief exports of Japan, are raised almost entirely by the labor of woman, and in the mechanical arts she appears to participate equally in the labor, although she gets little or none of its credit. Her deft fingers fashion many of the choicest pieces of cloisenne, and the ceramics, and in the decoration of lacquer that which comes from her hands is equal and often superior to the work of man. She weaves mats and other articles of straw, she braids bamboo baskets, and the thousand and one other articles that are made from that useful tree. She goes out with her husband in fishing boats and dries and salts the product that he brings home; she assists in house-building and cabinet-making, and in various other occupations which in the western countries are not considered suitable to her sex, and does most everything that man can do quite as well and as rapidly, although her wages in every employment are only a little more than half of his. She is always present in the shops and stores, usually as bookkeeper and cashier. Some of the largest stores are managed by women, and a few are owned by them. And, although the laws and social regulations of the country prohibit, sometimes you find a woman whose force of character defies both courts and customs and directs the financial affairs and the business of her family, as well as the matters that pertain to the household.

There can be no market for American agricultural implements and machinery in Japan for two very simple reasons. First, the farms are not big enough, and, second, labor is too plenty. If a Japanese farmer should introduce a modern reaper and self-binder upon his farm he would cut down everything in the way of crops while he was turning it around, and there wouldn't be anything left for him and his family to do all the rest of the season.

Most of the farming implements are of a very primitive character and many are home-made. Just as the New England farmer used to whittle his axe helves before the big log fire in the winter, so the Japanese farmer makes his own flails and rakes of bamboo, and the handles for his hoes, spades and sickles in cold and stormy weather. The iron portion is fashioned at the nearest blacksmith shop. These tools last for a lifetime, as they are kept with great care, and are often passed down from generation to generation. Everything is done by hand. You can travel all day in some of the farming counties without seeing a horse or a mule or any other kind of a beast of burden, and goats and sheep, cows and swine are equally scarce.

Japan is one vast garden, and as you look over the fields you can imagine that they are covered with toy farms where children are playing with the laws of nature and raising samples of different kinds of vegetables and grain. Everything is on a diminutive scale, and the work is as fine and accurate as that applied to a cloisenne vase. What would an Illinois or an Iowa farmer think of planting his corn, wheat, oats and barley in bunches, and then, when it is three or four inches high, transplanting every spear of it in rows about as far apart as you can stretch your fingers. A Japanese farmer weeds his wheat fields just as a Connecticut farmer weeds his onion bed, and cultivates his potatoes and barley with as much care as a Long Island farmer bestows upon his asparagus or flowers.

When grain is ripe it is cut with a sickle close to the ground. The bottom ends are carefully tied together with a wisp of straw; the bunch is then divided and hung over a bamboo pole or a rope, like Monday's washing, to dry; sometimes in the fields and sometimes in the back yard, and even in the street in front of the house.

When it is thoroughly cured the heads of grain are cut off with a knife and the straws are carefully bound up and laid away in bundles. The heads are then spread out upon a piece of matting and beaten with a flail. Another method of threshing is to take handfuls of straw and put them through a mesh of iron like needles.

After the threshing is done the grain is taken up in a sort of scoop basket made of bamboo, and shaken by one woman, who holds it as high as her head, while another woman stands by with a large fan, which she waves rapidly through the air and blows the lighter chaff away from the heavier grain as they are falling. The richer farmers have separators, built upon a primitive plan and turned with a crank. People often winnow grain by pouring it from a scoop upon a fan three or four feet wide, upon which it is tossed up and down gently so as to leave the chaff in the air when it falls. Another method of threshing is to beat the heads of grain upon a board or a row of bamboo poles. Sometimes you see a whole family at it.

In passing through country districts in a carriage or jinrikisha one finds the greater part of the roadway preempted by the farmers of the neighborhood for the purpose of drying their grain, which is spread out in thin layers upon long mats, and is raked over every now and then by an old woman in order that the particles on the bottom may get their share of the sun. The straw, which is still tied together in bunches, is hung over racks along the roadside during the day, and carried under shelter at night to protect it from dampness as well as from thieves. Sometimes the racks are 30 to 40 yards long, and 18 or 20 feet high, with a series of poles, and the farmer's wife or one of his daughters comes along at intervals to inspect it, to see that it is curing evenly, for it is almost as valuable as the grain.

Every particle of straw is saved, and it is put to a thousand uses. They make of it hats, shoes, ropes, roofs, matting, the partitions of floors of houses, waterproof coats, baskets, boxes and a thousand and one other useful articles. They braid it for fences, too, and the finer, softer qualities are cut up for fodder.

There is very little hay raised in Japan. The grass is very wiry and indigestible. It cuts the intestines of animals. Some alfalfa is grown, but it does not prosper. In the neighborhood of Kobe, which is one of the seaports on the southern shore, the soil seems to be better adapted for hay, and the best beef comes from that locality. M. Howard, of Yokohama, keeps a cow in his stable with his horses, but imports all his hay from California.

The ordinary Japanese horse, which originated in China, and is called a griffin, seems to like straw and thrives upon it, but he is small and ugly and is not capable of much endurance. He resembles the Texas broncho in appearance, but a journey of fifteen miles will use him up. They chop the straw very fine for feeding purposes, mix it with oats, barley, millet and other grains, and by adding water make a kind of mush. Oxen are given the same food, and in some portions of the country one sees a good many of them. They draw their loads by ropes stretched from a collar to the axle of the two-wheeled cart. One man leads them by cords attached to rings in their noses, while another steers the vehicle with a tongue that sticks out behind.

On very rare occasions you may find a man plowing with a cow or an ox, but more frequently with man or woman power. The Japanese plow is a section of the trunk or the branch of a young tree with a proper curve to it, and is all wood except a narrow pointed blade, which is fitted into the framework. It has only one handle.

Every variety of agriculture is carried on in a manner similar to that I have described, and the soil is in constant use. A couple of acres is considered a large tract of land for farming purposes. Most of the farms are of smaller area, and the crops are greatly diversified. Upon such a little spot of land will be grown almost everything known to the vegetable kingdom; a few square feet of wheat, barley, corn and millet, a plat of beans, perhaps ten feet wide by twenty feet long, and an equal amount of potatoes and peas, then a patch of onions about as big as a grave, beets, lettuce, celery, turnips, sweet potatoes, vegetable oysters and other varieties of cereals and roots occupy the rest of the area.

The farmer looks upon his growing crop every morning, just as an engineer will inspect the movements of his machinery, and if anything is wrong repairs it. If a weed appears in the bean patch he pulls it up; if a hill of potatoes or anything else fails it is immediately replanted. And when he cuts down a tree he always plants another to take its place. The artificial forests of Japan cover many hundreds of square miles, and by this accuracy, economy and care, the prosperity of the country is permanently assured. As one crop is harvested, the soil is worked over, fertilized, and replanted with something else.

The largest area of agricultural lands in Japan is devoted to raising rice, perhaps as much as nine-tenths of the whole, and as that crop requires a great deal of water, the paddys are banked up into terraces, one above the other, and divided off into little plats 25 or 30 feet square, with ridges of earth between them to keep the water from flowing away when they are flooded. All farming land is irrigated by a system that is a thousand years old, and some of the ditches are walled up with bamboo wickerwork.

The farmers live in villages, and their farms are detached, sometimes a mile or two or three miles away from their homes. There are no fences or other visible marks of division, but every man knows his own land, for it has been in his family for generations. Irrigating ditches and little paths are usually the boundary lines.

Theoretically all the land belongs to the Emperor, but the greater part of that under cultivation has been held in the same families for generations, and always descends from the father to the oldest son.

The official statistics of Japan show that there are 11,400,008 men and 10,948,053 women engaged in agriculture, which is more than half the total population.—Wm. E. Curtis, in Chicago Record.

FACTS ABOUT BANK NOTES.

They Have Been Used for Many Curious Purposes.

Curious and not uninteresting is the fate which occasionally befalls banknotes, as the following instance will show: Some time ago a wealthy gentleman in the north of England caused quite a sensation at a fancy dress ball by appearing in a costume covered entirely with banknotes, which were stitched on. The gentleman secured the first prize for the best dress of the ball, but it may, perhaps, be questioned whether he arrived home without finding himself minus a few of his valuable adornments.

It is said that the Duke of Wellington once, during a battle in the Peninsula, made use of a banknote in a unique way. In the heat of an engagement he found it necessary to send a dispatch to a distant point of the field, and not having any paper convenient, wrote his message on the back of a "fiver."

A few years ago a banknote was made use of by an unlucky gambler, in a sad and tragic manner. The unfortunate man, who had ruined himself beyond redemption on the turf, blew his brains out, and his last banknote served for the wadding of the pistol.

An amusing story is told of a farm laborer who one day presented at a bank a rag of gray paper, crumpled and pulpy, the type hardly legible, which he said was a banknote. His explanation was that a pet goat in his kitchen had got hold of and eaten it—a goat of expensive habits. The note had been in the animal's stomach some time before it was missed, and was only suspected to be there because one of the girls had seen Nanny "mumbling over" a bit of gray paper. the owner went through a serious domestic difference of opinion and mental struggle before he decided whether to sacrifice the pet on the chance of recovering the money. The struggle betwen sentiment and "siller" ended unfavorably for the goat, and after all, the "promise to pay" extracted from so strange a hiding place was so bechewed and mangled that the poor man was kept in suspense for some time as to whether he might lose both his money and his pet. But his story was ultimately believed and he went away comforted.

There was an old, eccentric lady of means, moving in high society, who always slept on a certain pillow, which she would allow no one to touch but herself, and always kept carefully locked up during the daytime. No one thought there was any particular value attached to her pillow, but put her conduct down to eccentricity. After her death, accident disclosed the fact that the pillow contained banknotes amounting in value to several thousand dollars. No doubt the old lady found it very soothing to sleep on so much wealth. Readers who suffer from insomnia may feel inclined to take the hint.

Comets as Portents

For Centuries Regarded as Forerunners of Great Events.

Several Instances That Are Cited From History.

Comets That Shone on the Great Napoleon—The Assassinations of Presidents Lincoln and Garefield Foretold.

The approach of Faye's periodical comet naturally raises the question to what extent, if any, this earth of ours is influenced by these strange denizens of heaven. That they have some influence has been stoutly maintained by astrologers of all ages.

Albumazar tells us that comets becoming first visible in Aries signify evil to the countries ruled by that sign, and that drought will be especially prevalent. Now, the comet of 1870 appeared in Aries, the sign of Germany, and in that year the Franco-Prussian war was begun and several districts in Europe suffered severely from drought. Donati's comet appeared in 1858, and was followed by the Italian war of 1859. The appearance of the great comet of 1861 coincided with a most destructive conflagration in London, and was immediatey folowed by the cutbreak of the civil war in this country. The assassination of President Lincoln belongs to the same epoch. This comet appeared in Gimini, the sign of the United States and London. The great comet (Comet B) was first seen in Gimini on May 22, 1881, and on July 2 of the same year President Garfield was shot. The same period was noted for its violent storms and hurricanes. Now, the ancient astrologers taught that the appearance of a comet in Gimini always signifies severe tempests and the death of some illustrious man.

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Evidences of a like nature abound in history. A comet tenanted the heavens for several months before the birth of the great Napoleon, and another one of vast splendor became visible at the beginning of September, 1811, when he was at the height of his glory. More curious still, it attained its greatest luster in the latitude of Paris, and it vanished over the latitude of Corsica. When Napoleon was dying a comet appeared again—for the third time in his notable life.

In 1606 a comet appeared in England in the watery sign Scorpio, and soon afterward there was a terrible inundation in Bristol, Somersetshire, Norfolk and the eastern counties. Nostradamus, by the way, predicted this flood in 1555, 50 years before it took place.

Oriental potentates have for centuries been swayed by comets. Timour, when one appeared, consulted Abdullah Lissan, a famous astrologer, and was informed that it presaged the utmost disasters to his enemies and especially to the Ottoman Empire. Abdullah predicted thus, seeing that the comet was in the west of Timour's dominions, and in the sign Aries. Timour prepared for war, entered his enemies' territory and utterly overthrew them. In the reign of Selim II. (1572), there appeared a comet which had the brightness and magnitude of a Venus. This excited the monarch's apprehensions, which were augmented by the predictions of his astrologers, who foretold that this phenomenon announced the calamities which excessive rain would inflict upon the empire. "Forty days afterward," says the historian, "they imagined themseves threatened with a universal deluge; incessant rains overflowed the monarch's dominions in Europe and Asia, laid waste three of his chief cities, swept away men, cattle and houses, and rendered the bridges and public roads impassable for several weeks." Whiston has conjectured that the deluge mentioned in the Bible was produced by the near approach of a comet to the earth, and he further surmises that the end of the world may be produced by the approach of a comet prodigiously heated in its perihelion.

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Even the great Charlemagne regarded comets as portents. Seeing one appear a few weeks before his death, he consulted his astronomers, and in reply to his secretary, Eginhard, who urged him not to grow uneasy, he said that he was not dismayed at such signs, but feared the divine framer of them, who, being incensed with anger against a people or a prince, is wont in this way to admonish them of his wrath and to call them to repentance. Other famous men held similar opinions. Cicero writes that "In civil war between Octavius Augustus and Mark Antony, it was observed that comets were harbingers of the miseries that then befell them," and expressed the opinion that "such appearances foretell great events." Pliny writes: "A fearful star this comet is, and not easily expiated, as it appeared by the late civil troubles when Octavius was consul, as also a second time by the intestine war of Pompey and Caesar, and in our days about the time that Claudius Caesar was poisoned and left the empire to Demetrius Nero, in the time of whose reign and government there was a blazing comet continually seen." Seneca exclaims: "Some comets are very cruel and threaten us with the worst of mischiefs; they bring with them and leave behind them the seeds of blood and slaughter." Socrates, writing of the seige of Constantinople, says: "So great was the danger that hung about over the city that it was foretold by a huge blazing comet that reached from heaven to earth, the like of which no man ever saw before." Anna Commenus, the daughter of Emperor Alexius, speaking of a comet that appeared before the invasion of the Gauls, says: "This happened by the usual administration of Providence in such cases, for it is not fit that so great and strange an alteration of things as was brought to pass by that coming of theirs should be without some previous denunciation and admonishment from heaven."

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Machiavelli, writing on the same subject, says: "Experience shows that some great commotions are the consequence of such signs as these." Millchius, a noted mathematician, says: "Much experience and observation show that comets announce great slaughter to the world, such as sacking of cities, subversion of kingdoms and other public disasters." The learned Grotius observes that "Comets and fiery swords and such like signs are wont to be the forerunners of great changes in the world." Raphael tells us that "The great comet in 1680, followed by a lesser one in 1682, was evidently the forerunner of all those remarkable and disastrous events that ended in the revolution of 1688. It also evidently presaged the revocation of the Edict of Nantes and the cruel persecution of the Protestants by Louis XIV., which was followed by those terrible wars that with little intermission continued to ravage the finest parts of Europe for nearly 24 years." Princess Olive of Cumberland says on the same subject: "Comets have been seen to be the forerunners sometimes of especial good, but more often of excessive evil. Thus a comet or blazing star may be presumed to have aided the wise men of the east to Bethlehem, as recorded with solemnity in the New Testament. The downfall of many states has been foreshown by prodigious sights seen in the air. Jerusalem, Egypt, Rome and many other regions declare as much, and, indeed, all strange and unusual apparitions of this nature are generally followed by direful effects, such as convulsions of the earth, insurrections, wars and changes of dynasties. A comet appeared just at the time Charles of England was defeated by Cromwell, and in 1819 a comet appeared in the summer previous to the death of the excellent Duke of Kent and of his Majesty George III."

Many other examples could be given of the popular belief that comets are harbingers of tremendous changes in mundane affairs. This belief is doubtless not as widespread as it was a century ago, but there are still some who cling to the old so-called superstitions, and even the most skeptical must admit that very notable things have happened on earth while comets were blazing in the heavens.—St. Louis Globe-Democrat.

GOLD IN ABUNDANCE.

The Expert Sent to Africa Made a Great Mistake.

The African gold fields of the Witwatersrand, now turning out $40,000,000 annually, had their share at the outset of adverse expert reports. It is nearly ten years since the Rothschilds sent thither Mr. Gardner Williams, at present the director of the De Beers diamond mines at Kimberly, an authority of the highest class, and he reported to his principals that there was no gold in the region. At present over two thousand heads of stamps are at work upon the ledge which he pronounced barren; and it is declared that the amount of "gold in sight" exceeds $250,000,000. This is only one field of the African outcrop. The deposits in Matabele Land show equal abundance and richness, and the work of their development is proceeding with great energy. Such a tremendous boom as that which the last year or two has witnessed in the South African properties must, of course, have its collapse, but the solid value of many of them may delay it for a time, and perhaps when the downfall comes act as a sort of parachute and let the whole frabic down gently instead of tumbling it in a mass of ruin. The gold production of the Transvaal bids fair in no long time to reach $100,000,000 annually, and there is no reason to imagine that it will materially diminish in a generation. The industry will in time take its normal direction undisturbed by booms, or speculative excesses, but undoubtedly has some powerful shocks and agitations to encounter first, concerning which the forecast of experts is as variable as the judgment of their predecessors on the value of the deposits. When they occur we shall know all about them. Till then each one is at liberty to guess for himself when the Kaffir bubble will burst, and the relative proportion of wind and guineas it will be found to contain. If there is an exorbitant volume of the former the latter are at least not wholly wanting, as they have been in some of the wildest and most extravagant enterprises which the history of speculation presents.—New York Tribune.

"Perhaps the most delightful friendships are those in which there is much agreement, much disputation, and yet more personal liking.—George Eliot.

KAFFIRS CANNOT STAY OUT LATE.

Kaffirs are known as Zulus. They are very ignorant, and go about almost naked. They travel on foot hundreds of miles from different sections of South Africa, to these gold fields, work about six months, save wages, return home, purchase ten bullocks, look up a wife, deliver the bullocks to the prospective father-in-law, and get married. Kaffirs are illiterate and perfectly harmless, and have a peculiar language of their own. There is a stringent law in force in the African Republic which compels the Kaffir to be in his home at 9 p.m. At this time a bell is rung in every town and city, and he must go home. Should he be found on the street, without a permit from his mother a policeman or constable puts him under arrest and he is fined ten shillings by the magistrate, and ten rawhide lashes are applied on his naked back. Kaffirs are prohibited from enjoying the sidewalks or pavements, and must walk in the street.—Johannesberg letter to the Pittsburg Dispatch.

Wizard of Lightning.

Nikola Tesla and His Inventions in Electrical Science—His Studies, Experiments and Marvelous Inventions.

Nikola Tesla is today the most interesting personality in the department of electrical investigation and engineering inventions in the world.

The fire which lately destroyed the Tesla laboratory in New York, consuming all the recent devices and creations of his ingenuity—the results of years of such labor as only such a man is capable of—had in it a touch of the tragic. But at any rate, it has directed public attention afresh to the character and achievements of this wonderful and still youthful inventor.

It is natural that the world should look with wonder on its great inventors. What they do often has the appearance of being the work of an especial "creative faculty." They seem to be men who have hade rather than merely formed something. In an age like the present, when so much of the world's industries depend upon mechanical use of nature's forces, the inventor becomes one of the greatest of public benefactors. This is especially the case when the saving economies—saving in time and in other expenditures—are so necessary. The available supply of the world's coal, for instance, is no doubt limited. Should this supply be prematurely exhausted the calamity would be beyond calculation. Engineering invention, if it can, must devise methods for its economical utilization and expenditure.

Are these other forces of nature still lying dormant or being let run on to waste—powers that are wanted in helping out the tremendous tasks which the eager workers of the world are having in hand? There is Niagara, with its seemingly almost infinite power, running to waste. Who can by searching find out nature's secret methods and fit the apt contrivance to the natural law so that that and other similar wasting forces may come into play along with the other working forces of this "industrial age?"

These are some of the questions which nobody has studied more deeply or with more surprising success than Nikola Tesla.

But who is this deep prier into nature's mysteries, this wonder-working magician? Where did he come from? How came he here? And how came he to be what he is, to do the things which have already made his name famous?

In the first place, this Nikola Tesla, though plainly enough a man of genius, is no magician. He is no mere visionary. He is no child of luck. His achievements have been no accidents. He is one of the most logical of men. He has not jumped to conclusions. Every perceptive faculty has been alert; but so have all other co-ordinate faculties of the mind been alive and alert, each faculty instant in the doing of its own part toward the wanted and waited-for result.

President Jordan of the Leland Stanford University, is right in insisting as he does in a recent strikingly just article in one of his educational reviews that "genius" should be taken as the "model in education." The man of true genius, when he does the things at which men wonder and admire, has no lazy fiber in his brain. All the faculties work—work at their best. And they work at their best because they work suitably and all together.

But Nikola Tesla—in America he is one of our "immigrants," as Emerson was, as Agassiz was, and some other such people whose names and services the new world will not soon let die. Tesla is now 38 years of age. He is by birth a Slav. His boyhood home was in the borderland of Eastern Austria, where Slav and Turk have so often struggled for the mastery. He was born in Smiljan, in the province of Lika. His father was a clergyman of the Greek Church, who had hoped to have his son succeed him in the sacred office.

As for his education, he spent four years in the public school, three years in the real school, three years in the higher real school at Cortstatt, and the or three years in the polytechnic school in Gratz, Austria.

By this time young Tesla had become so absorbed in his electrical studies, experiments and scientific ideas, that he saw, as he expressed it, felt that he must "get into the gulf stream of electrical thought." Accordingly, breaking away from all ties and traditions of the past, in 1881, he came to Paris, presently obtaining employment as an electrical engineer. It was not long, however, before it became plain to him that America was the place for him. Associated for a time with Edison, in whose shop he took off his coat the day he landed in America, he threw himself into the mid-stream of the then extraordinary intensity of electrical investigation and invention.

In 1887 the Tesla Electric Company of New York having been formed, he devised and brought into use the epoch-marking motor for multiphase alternating currents, thus dispensing both with commutator and brushes.

Tesla was engaged about this time, contemporaneously with Prof. Ferraris, an independent inventor, in perfecting the demonstration of the enormously important principle of the rotary field motor—a new system of electric distribution and transmission of power by means of alternating currents.

The various Tesla patents having been acquired by the Westinghouse Electric Company, they began at once to be put to uses in many ways, to the inestimable advantage of the world's growing mechanical industries. In the year 1890 Mr. Tesla, severing his connection with the Westinghouse Company, devoted himself to the study of alternating currents of high frequencies and very high potencies. His lecture on "Experiments With Alternating Currents," delivered before the American Institute of Electrical Engineers, and shortly after repeated before similar bodies in London and in Paris and elsewhere in the summer of 1891, marked a fresh era in the evolution of electrical applied science.

At the present time Tesla is devoting himself to the working out of another great invention, but this time in the department of mechanical engineering known as the oscillator, from which immensely important results are anticipated. If successful, this new mechanical contrivance is a combination of the steam engine and the dynamo, by which, it is said, an engine of a given power can be made about one-fortieth the weight of the ordinary engine of the same power. In the oscillator the piston travels its path to and fro 100 times a second, or oftener if required. In one form of the oscillator two pistons are used that go out and in the opposite ends of the cylinder at the same time, thus balancing their motion and relieving the apparatus from the rapid shock of vibration.

Just how revolutionary this new step in both steam and electrical engineering is destined to be is not yet wholly certain. But in view of what is already as good as certain that electricity is destined, and that before long, to take the place chiefly of steam in railway and other traction, in the opinion of those most competent to judge, its importance can hardly be over-stated. The problem, the worst to be met, has been to devise the best type of engine for driving the simplest and most economical form of dynamo. Of course, until the problem has been completely worked out there remain some things about it which the wary inventor "keeps to himself and scarcely tells to any."

Some of Mr. Tesla's most brilliant experiments of startling beauty have had to do with phenomena of light and heat as produced by electrostatic forces acting between charged molecules or atoms. As described by Mr. Marten, perfecting a generator that would give him currents of several thousand alternations per second, and inventing his disruptive coil, he has created electrostatic conditions that have already modified many accepted notions about electricity. For one thing, it has been supposed that one or two thousand volts potential would surely kill, but Mr. Tesla has been seen receiving through his hands currents of a potential of more than 200,000 volts, vibrating 1,000,000 times a second, and manifesting themselves in dazzling streams of light. An actual flame is in this way produced of intense whiteness that does not consume anything, "bursting from the ends of an induction coil as though it were a bush on holy ground," with such vibrations as can be maintained by a potential of 3,000,000 volts. Mr. Tesla expects some day to clothe himself in a robe of lambent fire that will be altogether harmless. Indeed, such currents as he now uses, he says, would keep a naked man warm at the North Pole; and as for the curative uses of such currents, who can say or gainsay in electrical science and engineering during the past ten or twelve years

Another of the ideas which Tesla is working out is that of the transmission of intelligence, or perhaps of power, across wide spaces without the use of any connecting wire. This, of course, is not any experiment of trying to "do something by means of nothing." It is entirely scientific. It is an effort to utilize the earth itself as an electric conductor. It is an attempt to get at the law of those earth currents of electrical force in a way to devise some method of getting the mastery of them, and of bringing parallel currents, though widely separated in space, into "resonating" relations with each other, the one electrical current being turned to the other.

As Mr. Tesla has himself said: "In connection with resonance effects and the problem of transmission of energy over a single conductor, I would say a few words on a problem which constantly fills my thoughts, and which concerns the welfare of all. I mean the transmission of intelligible signals, or, perhaps, even power, to any distance without the use of wires. I am daily becoming more and more convinced of the practicability of the scheme, and though I know full well that the majority of scientific men will not believe that such results can be practically and immediately realized, yet I think that all consider the developments of recent years by a number of workers to have been such as to encourage thought and experiment in this direction. My conviction has grown so strong that I no longer look upon this plan of energy or intelligence transmission as a mere theoretical possibility, but as a serious problem in electrical engineering which must be carried out some day. The idea of transmitting intelligence without wire is the natural outcome of the most recent results of electrical investigations." Some enthusiasts, he says, have expressed their belief that telephoning to any distance by induction through air is possible; for himself he cannot stretch his imagination so far, but he declares his firm belief that it is practicable to disturb by means of powerful machines the electrostatic condition of the earth, and thus transmit intelligible signals and perhaps power. We need not be frightened, he says, by the idea of distance. To the weary wanderer counting the mile posts, the earth may appear very large; to the astronomer it appears very small. So, Tesla thinks, it may seem to the electrician. The "big earth," as we call it, contains a certain capacity of electricity; let the electricians of the world find out how to measure that capacity, and then, reasoning solidly from one point to another, find out how to convert the "art and mystery" into the art and mastery of it, for the world's everyday uses.

Nikola Tesla is a man of a most interesting personality. Through his inventions he has begun to do the work of millions of workmen, so helping on immensely the great world's industries in order to the growing comfort and happiness of mankind. This man, of whom America is now so proud, is not without honor in the region of his birth. The Order of the Eagle has just been conferred upon him by the Prince of Montenegro, as previously the Order of St. Sava had been given him by the King of Servia.

MORE TO THE POINT.

"Is she the daughter of a hundred earls?"

"No, but she's the daughter of a million dollars."

IT WAS REVISED.

It was merely the editor's nerve that saved him.

"Sir," cried the irate reader, "I demand the proofs of that scandalous story you printed about me in this morning's paper."

"Certainly," said the editor. "Get this gentleman the galley proofs of that article about him. He'd like to read it in its unrevised form."

And the irate reader, overcome by the joke, rushed chattering insanely from the sanctum.