VALUABLE TO SCIENTISTS.

Importance of the Work of a Magnetic Research.

Instruments at the Naval Observatory Said to Be Rendered Useless by the Proximity of Railroad Tracks—Some Unsolved Problems.

The magnetic observatory in connection with the Naval Observatory is still regarded as somewhat a useless adjunct, owing to the fact that the electric railroad which runs in the vicinity causes entire disarrangement of the delicate in strument used to record the variations in the magnetic currents of the earth.

The importance of magnetic observation and research is constantly becoming more prominently recognized and other countries have begun to establish observatories for the purpose of conducting such investigations. It appears somewhat strange that the United States should be deprived of possible scientific discoveries of the highest interest and importance because of a private corporation.

An authority on the subject of magnetic currents while discussing them a day or two ago, said:

"The far-reaching import of an adequate knowledge concerning the magnetic currents, their variations, etc., it is impossible to exaggerate. Consult the old seaman on the main cause of collisions at sea; he will tell you the needle of the compass, influenced by one of those magnetic disturbances, the cause of which is unknown, has set the mariner astray. The latter may trust to his compass and disregard the temporary variation, which is the safest procedure; but, more often, realizing that the needle is unreliable, he will steer in what he imagines is his true course, and, a trifling mistake at first may carry him miles out of his way. This, on an ocean in which the path of a vessel is as distinctly marked as a roadway on land, means probable disaster, and such danger could be obviated by a knowledge of those mysterious magnetic influences the omnipresence of which we only now realize in a vague sort of way.

"Magnetic observations have so far been considered in their all-important bearing as necessary to safe navigation in wood-built ships, and in a far higher sense as indispensable to that of the iron or steel-built ships which now cover the ocean, the magnetic charts hitherto generally required for these purposes being those on which normal lines of equal values have been given; but something more is now needed.

"Observation in comparatively recent years has shown that not only are there large 'regional' magnetic disturbances extending over large areas of land, but that in moderate depths of water where the largest ship can navigate freely, the land below is also found to have considerable areas of local magnetic disturbance which, if not allowed for, may in thick or foggy weather lead ships into danger by seriously disturbing their compasses.

"The United States has done excellent work in the past in producing charts of isomagnetic lines, or charts in which the chief local magnetic disturbances are recognized, and the full results of observation recorded. The magnetic surveys of Rücker and Thorpe, in the British Isles, of Morean in France, of Rijckworsal in Holland, and elsewhere, have thrown considerable light on the magnetic conditions of those countries, but there remain whole continents to be covered by the observer.

"The direction, too, of the isomagnetics, from the deep sea to the dry land of the coasts is an extension of the subject on which we need much information, but one which affects the safety of navigation as well as the question that has been raised, whether the water areas of the globe are, as a whole, more or less magnetized than the land areas.

"The points of interest in the question of regional magnetic disturbance are not confined to the magnetician, or to the mariner, for the geologist cannot afford to neglect the valuable information the magnetic needle affords. Thus, although Rücker and Thorpe have since made a second and more elaborate survey of the British Isles, their remark of 1890 that 'the kingdom can be divided into magnetic districts in which the relations between the direction of the disturbing forces and the main geological characteristics are so suggestive as to be worthy of careful statement and further investigation, not only holds good, but has received confirmation.

"The mining engineer is deeply interested in a knowledge of the declination of the magnetic needle. Charts of normal lines are of great use to him whether above or below the earth's surface, but especially below when he has no other guide. To such a one a knowledge of regional magnetic disturbance as deduced from surface observations is most important, as it tells him when he is in the neighborhood of magnetic rocks, the disturbing effects of which on his compass needle may be far greater in the depths of his mine and turning it into a treacherous guide.

"And now, looking at the subject in its direct relation with the practical work of the Naval Observatory, who will say, in this great maritime nation, that the work of magnetic observers, even if solely to facilitate navigation, and insure safety at sea, is not worthy of the fullest consideration?

"But there is, besides, a vast field of enquiry for the observer of terrestrial magnetism in unraveling the secrets of the earth considered as a magnet, and the ceaseless change of its magnetic condition which the needle tells us of, for which no immediate practical result can be foreseen, yet is worthy of the attention of the ablest physicists and most advanced mathematicians.

"For instance, the unusual heat of this summer is co-existant with an appearance in the sun which is noted at regular intervals. This appearance in the sun, moreover, is accompanied by magnetic disturbances on the earth of very pronounced character; thus, you see, a very interesting condition is opened for investigation. The appearance of sun-spots of unusual size, or in great numbers, is invariably accompanied by a proportionate disturbance of the needle in the magnetic observatory, or rather, was, when the apparatus was in working order. Indeed, the observer in charge of the apparatus would often tell the one at the telescope, as he greeted him in the morning, that he might look for sun-spots, as the needle was found unusually disturbed, and the prediction invariably turned out correct. These magnetic disturbances, having apparently such a direct relation with sun spots, when of very pronounced character, were invariably followed by violent magnetic storms, insomuch that the matter engaged the attention of certain officials of the Weather Bureau as one worthy of research in connection with the work of that institution.

"During the eruption of the volcano of Krakatoa, in 1883, a remarkable alteration in the amount of secular change was noted in the declination and inclination of the needle at the observatories of Bombay, Batavia, and Hongkong. This may have been only a coincidence, but it may also point to the possibility that the changes below the surface of the earth which culminated in that mighty explosion, and may still be at work, have had, and continue to have, magnetic effects which are recorded by the needles at those observatories.

"Our present amount of knowledge on the subject of terrestrial magnetism is just about enough to cause us to realize, in a vague and undefined manner, the immense amount we do not know.

"We do not know why the earth is a magnet, the cause of the secular change of its magnetism, why it is subject to solar diurnal, lunar diurnal, sidereal diurnal, and the other variations and disturbances, nor the cause of magnetic storms, although we can observe connections between them, earth currents and auroral. Whether the causes of all these exist below the surface of, or are external to, the earth, or are a combination of the two, has still to be learned, and it seems hardly too much to hope that the restless needle will sooner or later be the means of opening up sources of knowledge invaluable to cosmical science, as well as to those concerned only with the planet upon which they dwell. Such results can only be accomplished by establishing around the earth a chain of magnetic observatories, conducting uninterrupted and systematic observations perhaps for a number of years, and then carefully comparing the entire data obtained. It is odd enough that the only magnetic observatory in the Dominion of Canada is rendered useless by the same cause that prevents us from using our plant—namely, an electric car line in the vicinity. Two observatories of this description are in process of erection in this country, and it is to be hoped that they may have luck enough to keep out of the way of the power of the corporation which is able to successfully combat the noblest efforts of science."

LOST, STRAYED, OR STOLEN.

Mysterious Disappearance of England's Ninety-eighth Yeomanry.

An extraordinary story of the total loss to all record and knowledge of two officers and some 300 men of his Majesty's South African Army is published today:

The two officers and 300 men have not been captured by the Boers, nor have they appeared as missing in any list of casualties, for they were lost some time before they left England, and only the vaguest rumors of their whereabouts, says the Central News, have since been forthcoming.

Many months ago a Yorkshire gentleman and officer offered to raise a body of Yorkshire volunteer artillerymen for service in South Africa on condition that he was himself allowed to command them. The offer, after some hesitation, was accepted by the War Office, and soon afterward there arrived in London some 300 sturdy Yorkshiremen gathered from the farming and manufacturing classes of the Riding, all of them volunteer artillerymen.

They caused at the time some remark by their appearance, for the majority of them were dressed partly in their private clothes and partly in the uniforms of the corps to which they belonged. Some wore helmets and corduroys, others jack-boots and military breeches, while the rest of their attire was their ordinary one. But, despite their heterogeneous appearance, they were just the material which was wanted, and Captain Grigg, the officer who had raised them, was very proud of his men. Khaki soon gave the necessary regular appearance to the troop, and they were dubbed the Ninety-eighth Company (North Riding of Yorkshire) Imperial Yeomanry.

From the day that they were christened nothing more has been heard of them. They disappeared from all record as completely as if they had never existed. After a time it occurred to the War Office that a knowledge of the whereabouts of the Ninety-eighth Company would be useful, and the enquiries then begun have been carried on to this day without anyone becoming any the wiser.

Aldershot reported at the time that it was believed that the Ninety-eighth Company had gone to South Africa. Soon after they were reported to be at Kimberley, but in reply to a cable the officer commanding communications reported that no such company as the one named had passed through Cape Town or any other of the South African ports. Enquiries in Yorkshire showed that the men were not in the county of broad acres following their ordinary employment.

Though the most diligent enquiries in South Africa failed to find the corps, nevertheless letters arrived at many villages in the North Riding from the men themselves describing plenty of hot fighting in which they had been engaged. The letters were forwarded to the Yeomanry officials in London, but as the only address which many of them bore was "On the veldt," it was impossible to locate them. Singularly enough, a letter written by one of the Ninety-eighth Company was received from Aldershot, in which the trooper described how sick "they" were of waiting for orders to proceed to the front.

It is now nearly a year since the company disappeared, and though the enquiries have been going on all the time the mystery remains unsolved. The War Office has still the hope that the opening of an office in London for the settlement of Yeomanry pay arrears will lead to the men discovering themselves.

At the headquarters of the Imperial Yeomanry Sir Robert Baillie did what he could to clear up the mystery.

"We have reason to believe," he said, "that the Ninety-eighth Company had a separate existence till the end of June last.

"There were 300 of them, all told, drawn from the Ninth Riding of Yorkshire. It was originally intended to attach them to the Duke of Cambridge's Own, and they were to go out with that battalion. But the battalion was never raised for certain reasons, and the Ninety-eighth was despatched in drafts. What port in South Africa they went to I am not in a position to say definitely, but at that time most of the Yeomanry were going through Durban.

"We understand that they were collected at Jamestown, and sent to Johannesburg, whence they were despatched to Kimberley. We were informed that they were there as the Ninety-eighth Company on April 10 last. Since then Col. Lowthian Bell, the commanding officer at Middlesbrough, has heard that the company retained its identity up till June.

"Where the Ninety-eighth is now I cannot say, but I suppose they will be running all over South Africa."—London Mail.

ILLUSIONS OF THE STAGE.

An Interesting Talk With an Old Theatrical Property Man.

The Swan in "Lohengrin" and How It Is Made to Appear Lifelike. The Descent of the Dove—Startling Effects in German Operas.

"There is one thing about German operas, Wagner's in particular," said an old "property" man at one of the local theatres the other day, "that does not probably appeal even to lovers of music, at least beforehand. This," he continued, "is the scenic effect necessary in many of this class of productions. Take 'Lohengrin,' for instance. The swan in that opera is a most interesting 'prop.,' and is the result of many experiments. To understand the action of the Lohengrin swan it is necessary to know all about the setting of the stage.

"At the back is a river drop, next come set water rows, graduating in height to the level of the bank, giving the effect from 'in front' of the water rushes and reeds, and so set that the swan and boat, in passing through, are enabled to describe a graceful curve. The foreground is a built-up bank the width of the scene. Between the river drop and the first set water row there is space, enough for the miniature figures of Lohengrin and the swan to pass across the stage before the real Lohengrin and the swan come into view. The drop and the set water rows—everything, in fact—give the idea of the sluggish Scheldt winding in through the weedy meadows. In order to produce the effect, two entirely distinct trucks are used—one for the first act, when Lohengrin and his swan wind their way among the reeds; and one for the last act, when the swan disappears, and the lost brother of Elsa takes its place. The problem that confronted the property master in designing the first swan and car, that is to say, the one which was to bring Lohengrin, was to devise a method of propelling the truck which carried the swan and the car so that it could be run in a curved direction, adding greatly to the naturalness of the illusion, and rendering the truck capable of being turned in a short space.

"A three-wheeled truck is built, the top of which is concealed by draperies painted to match the water rows themselves. The truck is propelled by two men seated within it, who shove the truck along by shuffling with their feet on the floor. The first man steers by means of a handle bar which is secured to the vertical rod which carries the front wheel. The swan is fastened to this vertical bar, so that when the direction of the steering wheel is changed the swan also changes its direction. The neck of the swan is built around a steel spring, and the wings are actuated by levers and strings. The second man has nothing to do with steering the car and the swan. His duties, besides propelling the car, consist in inclining the head of the swan and operating the wings. This is accomplished by means of lines which are invisible to the audience. Lohengrin, on reaching the steps at the bridge, in front, gets out of the boat or car, and sings his well-known 'farewell song.' The swan then takes its departure, drawing away the car.

"Now, in the last act an entirely different mechanism is employed, although the change is not perceptible to the audience. In this case it is not necessary for the swan to take a sinuous course, and it proceeds in a straight line across the stage. For this occasion a truck is mounted on four wheels, and is pushed by the men; but in order to transform the swan into Elsa's brother, it is necessary to resort to an entirely different system. The swan, instead of being supported by a couple of rods, is supported on a parallel, which is hinged; it is normally held in position by means of cords, so that it shows above the set rows and the bank of the river. When the time has arrived for the transformation to be made, a man at the rear of the truck lets go of the cord which holds the swan in position; the parallel immediately drops, and is drawn back into the truck, carrying the swan with it. At the same instant Elsa's brother is raised by a trap which places him in precisely the position occupied by the swan a moment before. Then a clock-work dove descends on a wire, and as the dove drops behind the set piece it takes the place of the swan. Lohengrin steps into the boat, and the dove carries it from the stage. The changes are so remarkable and effective that the Lohengrin swan may, I think, properly be regarded as one of the most successful effects obtained in grand opera.

"Another remarkable effect in connection with Wagner's operas is that of the floating Rhine daughters in 'Rheingold.' You may remember that, when the curtain rises on this opera, the scene represents the bed of the Rhine. In the centre rises a high rock which supports the 'Rheingold,' a great nugget of gold that glimmers on the summit of the rock. The three Rhine daughters, Woglinda, Wellgunda, Flosshilda suddenly appear upon the scene, floating with graceful movements about the rock which supports the 'Rheingold.' It may not occur to the spectator how it is possible for the Rhine daughters to float in space while they sing. But the explanation is simple.

"Each of the singers is supported upon a cradle, which is secured to a four-wheeled car by an upright post strongly braced. Each of the cars is pushed around by two attendants, while a third sits in front and steers. They are hidden from view by low screens which effectually conceal them.

"In Mozart's opera of 'Don Juan,' a rather curious illusion occurs. The monument of the commander bears the inscription, 'Here revenge awaits the murderer.' The moment that Don Juan appears in front of the monument one of the stage hands removes a strip of some opaque substance from behind the transparent inscription, which now appears in brilliant letters on the base of the monument, the letters being lighted by lamps behind the statue.

"The army of demons and ghosts which pass over the stage in 'Der Freischutz,' and which have been known to cause nervous persons to swoon, are produced in various ways. In some cases a movable scene is used, and in others the uncanny creatures are painted upon a canvas roll, and are projected by means of a powerful light upon a scene representing clouds. Hissing, snapping, screeching, and other hideous noises are produced by means of whips, clappers, whistles, rattles, and other like devices, behind the scenes."

VINEYARDS IN PALESTINE.

Jewish Colonists Revive Ancient Industry of Holy Land.

The account of the trade of Palestine during last year, given in the consular report just issued, is fairly hopeful, though neither the exports nor the imports reach the level attained in 1889. The prosperity of the country depends still, as it always has done, and most probably always will do, upon the fruits of the earth. Centuries before the present era corn and wine and oil were among the chief boons of the "promised land," and though we hear little now of the first, the other two are regaining their ancient reputation. To melons, which also were valued in ancient days, a new fruit has been added—the orange. This, indeed, and the grape are now the most important products of Palestine, though the exports of the former have declined considerably in value during the last few years. Jaffa oranges, however, maintain their reputation, so that it may be hoped that the depression is only temporary. Southern Palestine has always been noted for its vineyards; it was Judah who "bound his foal to the vine and washed his clothes in the blood of the grapes."

Of the principal Jewish colonies in the Jaffa district Richon-le-Sion, Petach-Tikvas, and Ekron, on the supposed site of the Philistine city, which last received the fatal trophy of the Ark, the first is the chief one for grape growing. A fourth colony, Sarona, also near Jaffa, is German. In all these agriculture, and especially everything connected with wine-making, is conducted on scientific principles, and the first and last have become really important centres in the trade. Richon-le-Sion has excellent works and machinery for the manufacture of wine, and great underground cellars for its storage. These last year contained about 1,100,000 gallons, in addition to a considerable quantity which is always kept in depot at Hamburg. Two kinds are specially in demand—a red wine, like a dry claret, and a dry white wine, rather of the nature of sauterne. The Germans of Sarona make wines of a good quality, though in less abundance. They bestow characteristic care on the processes and turn out a large number of varieties—a red and white muscat, a red wine like affenthaler, a red "alicante," and two other white wines—reisling and sarona. All, we are told, compare favorably with the common French and Italian wines, and are beginning to find their way to Europe, probably appearing in wine lists under French or, occasionally, German names.

There is an excellent prospect, therefore, that the vineyards of Palestine may once more be of note, as in the olden days. Many parts of the land seem to be naturally adapted to grape growing, although the industry has for long been neglected, partly, perhaps, because the Koran frowns upon the vine. One traveler speaks of a vine near Acre, the branches of which formed a shelter more than thirty feet broad and long, and bore bunches weighing ten or twelve pounds. The late Dean Stanley describes, as one peculiarity of Judea, the abundance of the terraced vineyards, with their watch towers and wall, just as they were for centuries before the fall of Jerusalem. But in those days the culture of the vine was far more general than now; it extended south of the boundary of Judeh into the region possessed by Simeon, and the late Prof. Palmer tells us how he saw even in the arid Negeb, or south country, signs of former vineyards. The revival of the ancient industry in this and other fruits is largely due to the Jewish colonies which have been planted by the liberality of their wealthy co-religionists, and the success of their efforts at once to help their own people and to make Palestine again a land to be desired is a matter for hearty congratulation.—London Standard.

WHY GLASSES ARE COMMON.

Modern Occupations Demand Keener Vision Throughout the World.

Take your stand at any street corner and note the spectacled people who pass. Glance round the interior of a tramcar—if you can see so far!—and reckon the number of spectacle users.

Watch the merry school child at play and see the round goggles hitched behind the infant ears.

No wonder the casual observer fears lest the fate of the eyeless fish in the mammoth caves of Kentucky should overtake the British people, and for lack of proper use the eyes of the nation should disappear.

But the outlook is not really so terrible. To Mr. J. H. Sutcliffe, Secretary of the British Optical Association, an "Express" representative is indebted for the other side of the picture.

"No," said Mr. Sutcliffe, "we are not going blind. On the contrary, our sight is much better. Ophthalmic hospitals will tell you that diseases of the eyes are lessening.

"There is, for example, much less ne-onatorium, or new-born ophthalmia, than formerly, thanks to modern conditions. It used to be a common cause of bad sight in later years.

"Really bad sight is only found nowadays among the agricultural classes, poor Irish, and the East End Jews, people who are not generally seen wearing glasses."

"How is it, then, one sees so many persons wearing spectacles?"

"In general I ascribe it to the fact that modern occupations demand keener vision. Take the case of the young girls employed in weaving.

"A girl may have very fair sight, and would not think of wearing spectacles in the ordinary way. But she finds that she cannot turn out as much work as the girl next to her. Then it becomes a question of wage-earning, and she gets a pair of glasses.

"So it is among girls engaged in type-writing, dressmaking, and other occupations demanding good sight.

"Eighty per cent of people have defective vision, and the ordinary man almost invariably has one eye slighly stronger than the other. Defects, though small, are constantly corrected nowadays by the use of glasses so thin that they would have been laughed at by the optician of a generation ago. The prejudice among young persons against the use of glasses has been greatly lessened."

Mr. Sutcliffe has an interesting theory, which he thinks ought to be put into practice.

He believes that among a number of artists some few fall short of genius only because their eyesight, unknown to them, is slightly defective. If one eye is more powerful than the other, the artist loses stereoscopic depth.

"Michael Angelo," says Mr. Sutcliffe, "could truly and accurately draw a complete circle. The feat would be impossible to any one with the merest suspicion of astigmatism. Messonier must have suffered from myopia to paint canvases of such microscopic size.

"If you take an artist with said mental gifts and normal but not absolutely perfect vision and correct the defect in his vision, I believe he would take much higher rank in his profession.

"No student should enter a public school of art until properly equipped and able to see things as they are. Symmetry and beauty would then become universal in private and public buildings, and the artistic world would look askance at unhealthy and decadent art."—London Express.

A VIOLIN CENTURIES OLD.

Rare Instrument Possessed by a Man in Chicago.

Manufactured in France During the Fifteenth Century—Supposed to Be a Genuine Duiffoprugca—Said by Experts to Be of Great Value.

Every now and then an old violin, which turns out to be the handiwork of one of the old masters of violin making, is found and it becomes the pride of its owner and the object of covetous regard of collectors and musicians. J. B. Wagoner, of 1029 North Clark Street, has an instrument made by Gaspard Duiffoprugca, in France, in 1516. There are marks of age about the instrument and some other indications, such as the mellow richness of the tone and the peculiarities of the finish, that strengthen his belief that his instrument was made 385 years ago. There is a controversy among musical instrument experts and musicians who have delved into the history of the art of violin making as to whether Gaspard Duiffoprugca ever made a violin. There are authorities ranged on both sides and the fragments of the histroy of the long dead master instrument-maker are so meagre that it is likely to be waged for an indefinite period. The trouble about either side convincing the other is that there are few facts to go on, and the controversy is confined to theories and deductions from preconceived estimates of the scope of his work. However, that controversy is interesting only as it touches the general histroy of violin making.

The violin was first evolved, according to the authorities, by the French instrument-makers toward the close of the fifteenth century, when they reduced the size of the older viol and with some changes of form and proportion made the modern violin. The statement that they made the modern violin is made advisedly, for since the perfect work of the old masters of the sixteenth century, there has literally been no improvement made on this grandest of musical instruments. The work of those earlier makers was so perfect that they turned out models that cannnot be improved upon and in many ways cannot be equaled. This is one of the reasons why the old violin, which has its history traced back to one of their workshops, is worth its weight in pearls. The ingenuity of later workmen has been equal to the task of improving almost every other musical instrument and implement of common use, but there has been no improvement in the violin, for the reason, the makers and musicians say, that the first generation of makers made perfect violins. There have been but two changes in the form, proportion, or arrangement of the parts since those first days. These changes are in making the sound bar slightly longer and adding a fraction to the length of the neck. These slight alterations, which mark the whole difference between the sixteenth century made violin, were made not because of any defects in the other or older plan, but to adapt the instrument to modern requirements.

The history of stringed instruments played with a bow, as is the violin, runs back to the time when a bishop of Poitiers found during the sixth century in Wales the first one, which was known as the Crwth. The authorities think that from this was developed the viol, the Viol Da Gamba, the Viol d'Amour, with its sixteen strings and sixteen other "sympathetic" strings, and finally the violin. Down to the beginning of the eighteenth century instruments of the violin class were given the general family name of the Welsh instrument of the sixth century. The Italians had been the makers of musical instruments of this class, and there is evidence that in France toward the end of the fifteenth century, or the beginning of the sixteenth, the evolution of the violin was perfected. The antiquarians say that in delineations of Italian scenes of a little later date the violin occurs under the name of "piccoli Violins alla Frances," or little violins of the French fashion.

The Wagoner violin is believed by its owner to be one of those produced in France in those earlier days. The supposed maker, Gaspard Duiffoprugca, went to France about 1510 from his home in the Italian Tyrol. He was a famous engraver and inlayer of woods and maker of violoncellos. The French King, Francis I, about this time was encouraging artists of various kinds to come over the mountains from Italy to educate his subjects to an appreciation of artistic things. Duiffoprugca settled at Bologna and afterward on the invitation of the King went to Paris. How long he lived at Paris, what he did out of the ordinary while there, where he went when he left, and where and at what time he died are mere matters of conjecture now, for the history of his after life and death is lost in the silence of the chroniclers so far as positive and exact statements are concerned. It is believed that he went to Lyons, or some point near there, where he had a powerful friend in a dignitary of the church. That he made violoncellos before and after he went to Paris is unquestioned. One of these instruments was adorned with more than the usual care of this maker, who is noted for the carving of the heads and the inlaid work he put upon the backs and sides of his instruments. The violoncello in question had in inlaid work on the back a complete plan of the city of Paris.

The violin, which is now owned by Mr. Wagoner, of this city, and which he believes is a genuine Duiffoprugca, has this elaborate carving and inlaid work that distinguished the violoncellos of this maker. The head is a finely carved one and represents a human head and face. The inlaid work on the back represents the towers, roofs, and chimneys of a city with churches, castles, and dwellings and a stream just without the circling walls. There is a bridge over this stream, and the whole work in the comparatively small space wonderfully portrays the scene, a dozen different woods being used in its. This, at the bottom of the instrument, the end of which rests under the player's chin. Just above this and at the other end of the back is the inlaid figure of a violoncello with the old-fashioned bow. There are a number of different kinds of wood used in this to give the proper shade to the different parts of the pictured instrument such as the strings, body, neck, the bow handle, the string-keys, and the like. The whole of this is surrounded by two twining vines which form a wreath. There is more inlaid work around the sides.

Mr. Wagoner knows comparatively nothing of the history of his instrument further back than the time of his father, who has been dead over forty years. The violin was an heirloom which came into the possession of the elder Wagoner, and was by him handed down to the son who holds it. The family for two or three generations lived in Pennsylvania, and when the present representative grew to manhood he moved West. Not being a musician, the old violin was packed away and has not been taken out or strung up for over forty years until within the last few days.

Musicians who have examined the old violin say that even in its present condition, a slight loosening of the front board at one corner and a small crack in the back showing the lack of care that has been bestowed upon it, it is undoubtedly a magnificent instrument. Independent of its right to claim Duiffoprugca as its maker, which it does in a pasted slip on the inside of the back, it is without doubt a very old and superior instrument.

The musicians who have handled the Wagoner violin have been interested in recalling the history of Duiffoprugca and the controversy which has raged over his violin manufacturing. The claim of those who hold that he made no violins is based upon the assumption that there is reason to believe he did not since they have no record of such work being done by him. There is equally as strong ground for the belief that as Duiffoprugca, who was a skilled manufacturer of violoncellos, he would fall into the fashion that the French makers had recently introduced of making the smaller instrument and that all trace of this fact as well as of the other important facts of his life and death were lost.

There was so strong a belief that Duiffoprugca had made violins that in the early years of the nineteenth century the most noted violin-maker of his day took advantage of it. This man was Jean Baptist Vuillame, of Paris. He conceived the idea of making a number of violins and crediting them to Duiffoprugca. He followed the characteristics of the early master in the matter of engraving and inlaid work and made instruments that were pronounced the perfection of art and sold as genuine Duiffoprugcas, being eagerly snatched up by the finest musicians of the Continent.

There was held at South Kensington in 1872 an exhibition of musical instruments at which were gathered together a large collection of specimens of the makers of every age and country and of all classes. In this collection were two iolins, one of which was labeled "Duiffoprugca, very ancient," and the other as a "Duiffoprugca, 1515."

The Wagoner violin is creating a great deal of interest among collectors and musicians, as, if it is what he supposes, it is one of the oldest violins in existence.—Chicago Chronicle.

SKYSCRAPERS ARE SAFE.

The Tall Office Buildings Not Damaged by Lightning.

Without doubt lightning was the first electrical phenomenon that was ever observed by human beings. To this day it remains the least known and least understood of natural electrical manifestations, except, perhaps, the aurora.

There is a vast deal of popular misconception concerning the danger of lightning and the nature of it. The lightning flash is a discharge from a cloud at a high potential with reference to the earth.

When the atmosphere is charged with water, vapor and some eddy or current in its colder upper strata is deflected downward, causing condensation, and exceedingly minute drops of water are formed, each bearing an electrical charge. The consolidation of these into larger drops results in a very great increment of the potential of the charge, since the capacity of the drop varies with its diameter and the volume of the drop with the cube of the diameter.

The consequence of this is that it takes, for example, eight drops consolidated to make one of twice the diameter of the constituent drops, and the charge on the surface of the consolidated drop will be four times as great as that upon the surface of its elements. In this way, as the small water particles unite to form drops which fall as rain, the potential of the charge they carry increases until it attains enormous values and the lightning flash leaps to the earth, which may be regarded simply as a body of very great electrostatic capacity. This discharge, which is called lightning, is apt to be more or less destructive, although the energy of an individual flash is perhaps not very great.

Often the conditions are such that the discharge takes on an oscillating character, producing violent surgings of current. No very accurate measurements have been made upon the current involved, but it is taken to be of the order of 1,000 to 5,000 amperes.

The electro-motive force necessary to cause a flash a mile long is probable several million volts, and, of course, the power of the flash measured in watts is very great, but its duration is correspondingly short.

Protection of property and life from lightning flashes has been a subject that has entranced the attention of natural philosophers since Franklin sent up his historic kite. The net result of more than a century of attempt to secure protection has been the lightning rod in its more or less inefficient forms, and the discovery that buildings of modern construction, having metallic roofs and often metallic frames as well, are practically immune from attack by lightning. The total number of deaths due to lightning in any given summer is comparatively very small—in the ratio of about one to each 200,000 population in the United States.

In cities the destructive influence of lightning is exceedingly small, although occasional fires are caused by it, especially where gas pipes abound.

Protection of electric circuits from lightning has been an interesting subject for research for a number of years, and several highly efficient devices have been constructed for this purpose.

Today lightning is little feared by the station superintendent, and should be very little feared by anyone. The time honored rule that it is wisest to keep in the open and not seek the shelter of trees is one which common prudence dictates. Recourse to the feather bed of our ancestors, however, is no longer necessary, except to quiet the timorous persons, while the ancient superstitions regarding handling steel instruments and sitting in draughts may be utterly disregarded. A modern building in a city is as nearly absolutely lightning proof and those in it are as nearly absolutely protected from lightning as is possible.—Electrical Review.

THE COUNTING MANIA.

Men Who Keep Tab on Cracks and Telegraph Poles.

"I have fallen into the strangest habit in the world," said a newspaper man who lives down below Canal Street, in a part of the Old Quarter, "and I am often greatly embarrassed on account of the thing. The counting habit has become a perfect mania in my case. I would give anything if I could quit it all. I want to count everything. I do count everything. One day recently I was walking home, and I must have been going at a pretty rapid pace, for when I came to my senses—for, really, I had lapsed somewhat on account of a certain mental violence—I was about to burn up.

"'Hello, old fellow,' said a friend of mine, as he patted me on the back. 'By the way, what on earth are you walking so rapidly for?' he continued.

"'Well, sir,' I said, 'I will be very frank with you about it. I am simply rushing about here like an idiot counting these telegraph poles. I have been counting them for some time, and I always rush from one to the other, just like there was immediate danger of the next pole disappearing before I could get to it.'

"My friend laughed heartily at my embarrassment.

"'You are not the only man who does foolish things of this kind,' he said. 'I just met Jones on Canal Street, and he was walking very rapidly, with his head down, and he wore the most serious expression I ever saw on his face. Jones is usually jocund, you know, but he was evidently in a deep brown study—and I do not mean to make any pun on names, either. I asked Jones what the matter was and he replied that he was counting the cracks in the sidewalk.'

"'So I am not the only fellow who indulges the useless habit of counting things. Really, it is very common. I have heard of many men who would count the number of steps home, or the number of cars they passed, or other objects, just so they could indulge the habit of counting things. Sometimes it is a trifle annoying, but there is no harm in it. Sometimes it is unconscious work, and I find myself actually thinking vigorously about some serious business matter while keeping tab on the number of telegraph poles as I glide by them.'—New Orleans Times-Democrat.

BOSTON'S BANANA TRUST

How the Fruit Is Distributed Throughout the Country.

Nearly Twenty Million Bunches Imported Annually—From Plantation to Market—Ten Thousand Men Employed—Sixty-three Boats Engaged

Did you ever stop to wonder by what process that daily cry, "Banana! Banana! Ten-a cent dozen-a!" of the Italian peddler at your door is made possible? Every city and every village in this country is regularly provided with bananas, and they are being used everywhere in increasing quantities. To supply the enormous demand is an immense and difficult undertaking.

That undertaking is successfully accomplished principally by a single great corporation, which was organized by Boston promoters and is carried on largely by Boston capital. Two years ago the Boston Fruit Company associated with itself certain other concerns and became the United Fruit Company, which today controls almost the whole business of importing bananas into the United States. President Preston was kind enough to explain to me the other day the system by which the people of this country are supplied with the fruit of tropical America.

A few figures will indicate the extent of the business. The company owns altogether 236,000 acres of land in six different countries, the value of its plantations being about $10,000,000. It operates a fleet of sixty-three steamers and employs about 10,000 men. It brings into this country every year nearly 20,000,000 bunches of bananas, besides great quantities of other tropical fruits. Each week of the summer three steamers bring to Boston alone 120,000 bunches, about 40,000 in each boat.

From the planting of the banana tree to the delivery of the ripe fruit in American cities, the company's system is complete. Years ago when the business of importing bananas was just beginning, the raising of the fruit was left in the hands of native planters. But very soon the stress of active competiton made native sluggishness and stupidity intolerable and the American companies began to buy up plantations and raise their own crops. Even American brains and energy, however, did not at first prove equal to the task of managing the large banana plantations efficiently, for the reason that both brains and energy seem to desert most men who remain in the West Indies or in Central America for any length of time. At least, that has been the experience of the Boston company. Man after man whom they have sent to those countries has yielded to the enervating influence of the tropics and has lost either ambition or honesty. It has taken twenty years of effort to collect a body of overseers upon whom the company may rely.

It requires men of more than average ability to solve the problems that come up in running a banana plantation. The land of the United Fruit Company is located in six different countries—Cuba, Jamaica, San Domingo, Costa Rica, Honduras, and the Republic of Colombia—in every one of which the mass of the population is unsettled, ignorant, and untrained to labor. Unwearying patience and firmness are both essential to the American manager who has to get his work done by the negroes and imported coolies of these countries. In order to attract and keep in its employ the thousands of laborers whom it needs, the company has established a commissary department which provides merchandise at low prices for its men.

After the company has raised the bananas on its own plantation it packs them in its own fruit cars and transports them over its own railroads to the nearest port, where they are loaded on the company's own specially constructed steamers and brought to its own wharves in American cities. The scene in Jamaican ports at loading time is a most animated one. The constant procession of blacks bearing the bunches from wharves to steamers is most interesting.

Boston, New York, Philadelphia, Baltimore, Mobile, and New Orleans are reached by the company's lines of steamers. The two Southern ports are the chief distributing centres and from them bananas are sent out over the whole United States to wholesale grocers in every important inland city. The bunches from Costa Rica, Honduras, and the Republic of Colombia, which are larger than those from the West Indies, pass through New Orleans and Mobile, while the island bananas are sent to the Eastern cities.

All the inland business is handled by a department of the United Fruit Company known as the Fruit Despatch Company, whose fruit cars are familiar sights over the whole country. Even to San Francisco, which would naturally be supplied, one would think, by the great fruit-growing region of southern California, the Fruit Despatch Company sends fifteen to twenty carloads of bananas every week.

When a cargo of bananas arrives at New Orleans or Mobile the ripe fruit is sold at once to local dealers, while the green bunches are sent northward by a special train. As it proceeds the train slowly dwindles, for sections of it are dropped at this point or that and sent off in various directions, until finally it is broken up altogether and the last car is sidetracked at some town in the far Northwest.

The principal difficulty in sending bananas a considerable distance is to keep them at a proper temperature. Now the proper temperature is not below freezing, as is the case with most foods, but about seventy degrees. Consequently, instead of providing cold storage, the Fruit Despatch Company has been compelled to build at Cairo, Ill., a unique "warm house." When the banana trains reach that city they are sent to a large shed which accommodates eighty cars at once. The cars are opened, and are thoroughly warmed. Then they are closed air-tight and sent on. Even in the coldest weather these cars will hold a temperature of 70 degrees for several days.

The 9,000,000 bunches of bananas which come every year to the four Northern cities are distributed about as follows: Baltimore, 1,500,000, Philadelphia, 2,000,000, New York, 2,750,000, Boston, 2,500,000 bunches. At all these cities most of the bananas go to supply local trade, and only a comparatively small proportion is handed over to the Fruit Despatch Company. In Boston, for instance, eighty per cent of all the fruit brought in is taken at once by wholesale dealers of the city, and the other twenty per cent goes to other parts of New England.

It is interesting to note that the sale of $5,500,000 worth of bananas last year by the Fruit Despatch Company entailed a loss by bad accounts, and so on, of less than one-eighth of one per cent, and that a very large business at the seaboard cities was almost equally free from losses. This remarkable record is to be explained partly by the company's business methods and partly by the completeness of its organization. To the Boston headquarters come frequent telegraphic reports from the managers of the company's plantations and agencies in every quarter of the continent, so that the whole army of ten thousand employes is all ways directly under the control of the company's officials at Boston.—Boston Transcript.

Winning Her Respect.

(From the Chicago Record Herald.)

"Mary, will you marry me?"

"No."

"But you respect me for my good judgment don't you?"

"Well, yes."