A MARVELOUS CLOCK

THE WONDERFUL MECHANISM IN THE STRASBURG CATHEDRAL.

Astronomical Phenomena Delineated—At Noon of Each Day the Apostles Pass Before the Savior.

New York Morning Journal.

Everybody has heard of the celebrated Strasburg clock, but only those who have had an opportunity of observing it in operation could ever form an adequate idea of its wonderful complexity, ingenuity and exactness, as well as its remarkable beauty as a work of art.

The Cathedral of Strasburg, where the clock is placed, is itself one of the principal objects of interest in all Europe. Its spire is the highest in the world, being 468 feet above the level of the cathedral floor and twenty-five feet higher than the Pyramid of Ghizeh, in Egypt. But grand and majestic as is this wonderful specimen of mediaeval architecture, it fails to interest the spectator as does its marvelous clock. Cathedrals of singular beauty and wealth of intricate ornament there are without number, but the Strasburg clock is unique of its kind.

Preceding the construction of the clock two others had been erected in the cathedral, the first in 1352-54; the second, begun in 1547, was, on account of many interruptions, not completed until 1574, and was the one that gave rise to the legend that Josias Habrecht, who constructed the works, had been made blind by the magistrate, or Mayor of Strasburg, that he might never be able to construct such another. This story was, of course, entirely a fabrication. This clock was restored in 1669 and again in 1732. It ceased to work in 1789 and was removed and set up in the Frauenhaus, in the Place de la Cathedrale, in Strasburg. Both of these clocks were wonderful illustrations of mechanical skill, and contained many of the curious features which distinguish their successor.

The present astronomical clock was begun June 24, 1838, started on its working career on October 2, 1842, when the tenth Scientific Congress of France held its session at Strasburg, and was solomnly inaugurated on December 31 of the same year.

It was constructed by J. B. Schwilgue, who was its sole inventor, and who employed in its construction no part of either of the old clocks. At the base of the clock is a celestial sphere, which indicates the sidereal or star time on a disk, or dial plate. The sphere is made of copper, is supported by four metal columns and is arranged for the latitude of Strasburg.

All the fixed stars to the sixth magnitude to the number of more than five thousand are here represented in their true positions on a field which displays the celestial canopy. They are grouped in 110 constellations, easily recognized. The sphere revolves from east to west in exactly one sidereal day, being three minutes and fifty-six seconds less than a solar day. It carries with it the celestial equator, ecliptic and solstitial and equinoctial solures, while the meridian and horizon lines remain stationary.

The mechanism which works this astronomical feature is of such precision as to show the constellations as they rise and set in the meridian of Strasburg, just as these movements can be seen by the naked eye.

A PERPETUAL CALENDAR.

Immediately behind the celestial sphere is a metallic band, ring-shaped, having a circumference of nearly thirty feet and bearing on a gold ground the necessary features of a perpetual calendar, with the names of saints, dominical letters, fasts and feasts, etc. It advances every day exactly at noon to its proper position as changed by the passage of twenty-four hours. A statue of Apollo at the right of the calendar points perpetually with an arrow at the name of the saint and the day of the year of the existing day.

On the opposite side Diana, as goddess of the night, stands as a pendant to the sun god. The calendar makes its revolution in 365 or 366 days, according as the year is common or bissextile, and operates with its own mechanism to suppress the requisite three days in four hundred years of the actual calendar. Between Dec. 31 and Jan. 1 and thereafter it bears the words, "Beginning of the common year," except in a bissextile year, when the word "common" disappears and Feb. 29 appears when due. Four figures, painted by the old artist, Tobias Stimmer, at the four corners, represent in character the four ancient monarchies, Persia, Assyria, Greece and Rome.

Within the band which presents the calendar are shown the common time, the movements of the sun and moon, rising and setting, the revolution of the latter around the earth, its right ascension, passage of the meridian, phases, and, finally, the eclipse of both sun and moon as these occur. The two luminaries are represented, the sun by a gilt disk with rays, the moon by a little globe, silvered on one side and black on the other. The size of each of these figures is in exact relation to the apparent dimensions of the heavenly bodies they represent.

In the center of the dial plate is a figure of the earth shown by its northern hemisphere, with all the countries between the equator and the pole, serving to indicate the passage of the sun and moon over the meridian of each of these countries. During an eclipse of the moon the dark side of the moon is turned toward the spectator, while an eclipse of the sun is shown by its being obscured in exact agreement with the nature of the eclipse, total, partial or annular.

Above the calendar the days of the week are represented by appropriate figures, which pass before the spectator during each day: Apollo in his chariot on Sunday; Diana, as the moon, in a car drawn by two doves, for Monday; Mars, armed and equipped for war, on Tuesday; Mercury, messenger of the gods, with his caduceus and purse, on Wednesday; Jupiter, armed with thunderbolts, on Thursday; Venus, accompanied by Cupid, on Friday, and Saturn, armed with a scythe and in the act of devouring a child, according to the old myth, representing Saturday and symbolizing the devouring and irresistible character of Time.

On both sides of that part of the structure presenting the days of the week are beautiful paintings, picturing the Creation, the Resurrection, the Last Judgment and the Triumph of Faith and Virtue. These paintings are accompanied by appropriate passages taken from the Bible.

THE GALLERY OF LIONS.

Next above is a balcony, which is called the Gallery of Lions, from the fact that it is guarded at either extremity by a superb lion carved in wood. One holds within his paws the crest and the other the escutcheon of the arms of Strasburg. The center of this gallery is occupied by a dial, the actual clock face of the structure, which gives the common time to the citizens of Strasburg. The dial derives its motions direct from the central power which governs the whole structure, while the other two, sidereal and apparent times, are regulated by intermediate mechanicism, in turn moved by the central motor, which is wound up every eight days.

On either side of the clock face there sits a figure termed a genius, or geni. The one on the right of the spectator holds in one hand a sceptre, and in the other a bell, on which he strikes the first blow for every quarter of an hour. The geni on the left holds an hour glass filled with red sand, which he turns every hour. The striking of the first blow for the quarter hour is followed at each quarter by other automatons, who make their appearance in a compartment and strike each his particular quarter. At each hour there is another symbolic procession. First, a child walks across the gallery and strikes the first quarter with a thyrsus on a bell. He is followed by a youth clad as a hunter, who sounds the half hour with his arrow. The third is a man garbed as a warrior, who with his sword strikes the third quarter. The last is an aged man leaning on a crutch, with which he strikes the bell and sounds the last quarter.

Meanwhile, in the center, near the bell, stands the figure of Death armed with a scythe. As each of the hours is marked by the appearance of the four ages this hideous figure strikes the bell, as though in mockery of the passage of time, with a human bone which he carries in one hand. This during the day, for at night the four ages, being mortal, cease their work. But night and day, indefatigable, eternal, Death strikes the bell at every hour with his emblem of dead humanity, just as in actual life, day and night are the same to him, neither offering any obstacle to the performance of his terrible function.

THE TWELVE APOSTLES APPEAR.

The upper gallery, more richly decorated than the others, is occupied by the figure of our Savior, thrown in the center. Placed upon His pedestal, He holds in one hand the banner of redemption while He extends the other, preparatory to giving the benediction. Each day, as Death strikes upon the bell the last blow of noon, there pass before Christ His twelve apostles, one after another, each carrying either the instrument of his martyrdom or the symbol by which he is commonly recognized, as St. Peter by the keys.

Each, as he passes before his Divine Master, turns his head toward Him and inclines it respectfully, whereupon the benediction is given him, after the manner described as given by Abraham to Isaac when the patriarch took his departure for the promised land. It is not until the last of the apostles has passed that Christ gives the benediction in the form of the cross. During the procession of the apostles a cock, perched upon the summit of one of the towers of the clock, crows forth his song of victory, beating his wings together and extending his neck, precisely after the natural manner of his kind. Every day at noon he crows three times, in memory of the time when his significant cries awoke repentance in the bosom of Peter in the Praetorium.

The dome which crowns the cabinet containing the clock is remarkable both for the elegance of its form and the richness of its ornamentation. In the center stands a sculptured figure representing the Prophet Isaiah. Around him are distributed the four evangelists, accompanied by the animals which have been given them for attributes. A little above them are four seraphim, each, on a different instrument, celebrating the glory of God. Finally, the dome is surmounted by the figure of the cathedral.

The tower, which is surmounted by the figure of the cock already mentioned, is adorned with paintings, representing Uranie, the one of the nine muses who presides over astronomy, a portrait of Copernicus and the three Parcae—Clotho, who spins the thread of life; Lachesis, who determines its fortune, and Atropos, the inevitable, who cuts the thread.

At the right of the spectator a smaller tower is reached by a winding staircase leading to the different stages of the clock, where the motors are to be seen, and which also gives access to the little balcony, whence can be viewed the exterior of the work, which has an elevation of about eighty feet from the base. The central motor, which controls the works of this stupendous clock, depends for its exact accuracy upon a regulator which beats seconds, and which, in turn, is regulated by a compensating pendulum and an escapement. This motor gives motion—first, to the hands of the dial for the mean time; second, to those of the great dial; third, to the planetarium; fourth, to the moon, for the representation of its phases; fifth, to the seven figures illustrating the days of the week; sixth, to the hands of the dial representing apparent time; seventh, to the solar and lunar equations; eighth, to the celestial sphere indicating the sidereal time.

It also, by the aid of a special mechanism, suspends the functions of the four ages during the night and accurately causes them to resume their work during the day. There are five other motors which produce the movements of the automatic figures and cause the bells to ring. No material was used in the construction of the clock but the most durable metals.

And so precisely conformed are the functions and relations of all the parts that it marks with the same exactness the passage of seconds and that of periods covering 25,000 years.

MR. HOWELLS'S WAIL.

Injustice of His Assertion Concerning the Position of Literary Men.

New York Letter in Philadelphia Press.

A recent comment of Mr. W. D. Howells has caused almost no end of contradictory discussion in literary and even in other circles in this city, and perhaps it has been quite as much discussed in those places as have the political or financial questions or even Theodore Roosevelt. Mr. Howells writes: "I have found that literature gives no one certain station in the world of men's activities, either idle or useful. We literary folk try to believe that it does, but that is all nonsense. At every period of life among boys and men we are accepted when they are at leisure and want to be amused; and at best we are tolerated rather than accepted."

This is looked upon here as a most surprisingly pessimistic statement from a man whose vocation it is to study the world and human nature. However, it is quite in accord with much that Mr. Howells is reported to have said in a despairing way of his profession. Theodore Roosevelt does not hold this view, and amid all the discussion which has been heard there is one point upon which almost every one agrees, and that is that it depends upon the man whether Mr. Howells be right or not. Mr. Roosevelt has had no other vocation outside of politics than that of literature, for his ranching in the West is a recreation, yet he has been accepted as a powerful force and many persons here regard him as likely to become one of the great influences of his party, and perhaps to gain its highest honors.

Mr. Howells himself, had he been willing to share in those activities of which he speaks, would have had his influence in them according to his worth, and it is thought amazing that the man who wrote this should also have recently written of his intimacy with John Lothrop Motley, who had no other claim than literature for such recognition as made him American minister at the Austrian court and later at the court of St. James, and with James Russell Lowell, whose life was devoted to literature, and because of his pre-eminence therein was named American minister to Spain, and later to the court of St. James, and who was also chosen presidential elector. Hildreth, and Howells himself, were nominated for American consuls because of work which they had done with their pen, and George Bancroft and James K. Paulding became members of a President's Cabinet when their only fame up to that time had been such as was gained by literary work. Professor Matthews and Professor Boyesen were called to chairs in the faculty of Columbia College mainly because of their literary achievements, and Bret Harte was named as consul to Glasgow, and before that to Cracow, as having no other claim than that which literature furnished him. Mark Twain would have been named for Mayor of Hartford at one time had he consented, and one of the younger generation of humorists, John Kendrick Bangs, was accepted very much in earnest by his party in the city of Yonkers and made for it a vigorous canvass for the mayoralty. The wonder here is whether Mr. Howells is beginning to feel disappointment in his own career and is disposed to lay the blame where it really does not belong.

THE MEDIAEVAL CHURCHES.

Contrast Between Those of France and England.

Robert S. Peabody, in Atlantic Monthly.

Although the mediaeval churches of France and England were built by men of the same faith and for the same Catholic ritual; although England was long under a distinctly French domination and a large part of France was for one or two hundred years occupied by and ruled over by Englishmen, yet national traits asserted themselves, as they usually do, and English and French churches differ as much as if an ocean parted them instead of the narrow flashing "silver streak."

In a few exceptional instances we find a church that seems misplaced. Westminster Abbey, with its apsidal east end and encircling eastern chapels, is built upon a French plan. Norwich, Peterborough, Lichfield and Canterbury have circular endings, and the choir of the latter, built by a Frenchman, recalls in its Corinthianesque shafts and capitals, as well as in other details, the cathedral in the ancient French town of Sens, from whence its builder came to Canterbury. On the other hand, Laon is one of the few French cathedrals that have that square eastern termination which is so nearly universal in England. These are, however, exceptions, and in general we find on one side of the channel both cathedral and parish church of an undemonstrative, long, low, picturesque and domestic style, and on the other side of the water they are self-asserting, aspiring, stately and majestic. The English buildings blend with the rural landscape, while the churches of France are of a grander type, and rise from stone-paved streets and from amid the burghers' houses.

And yet, though lowness and length are such marked characteristics of the English cathedral, by a strange contradiction there is nothing about these English churches carried to a greater degree of perfection, or which brings them greater glory, than their clustered towers and their groups of heaven-soaring spires. At Caen and Coutances and Bayeux and Saint-Ouen we see the Frenchman attempting a central lantern over the crossing of nave and transept; but the Englishman, with his unerring instinct for a pleasing group and a picturesque arrangement, seized upon the idea of combining three towers on one church as his own, and at most of the English cathedrals we find, beside the western towers, either a central spire or the preparation for one in the shape of an incomplete tower. This ambitious tendency frequently ended in disaster, and many a cathedral such as Lincoln has boasted of lofty spires which do not exist to-day. Doubtless the western towers of the great French cathedrals, and perhaps even single western spires on those majestic temples, taken by themselves, are more grand and stately structures than similar features in England. In such a comparison England makes a poor showing. At Rouen, at Bordeaux, at Laon, the Frenchman was most ambitious, and started to raise towers at the west end and at both transepts, but all are incomplete, and no French church possesses a single central spire to vie with that of Salisbury or of Norwich, and surely none can offer a group of three spires to compare with those of Lichfield, nor can many foreign examples compete, as graceful and beautiful compositions, with the three uncrowned towers of Canterbury or with their sisters at Lincoln or at Wells.

But of all the features that mark and identify the English church, its square eastern ending would seem to be the most universal and the most self-evident. In France the choir of a church has a circular end, and the aisle encircles that, and is roofed, in consequence, with much involved and irregular vaulting, while beyond the aisle is the chevet or surrounding range of chapels. Throughout England, however, a church, whether small or great, has a square ending. Many may think this simple, quiet termination should be preferred to the intricate vaulting and tangled perspective of the French chevet, with its flanking chapels, but the French method is the more ambitious, involves vastly greater constructive skill, and produces by far the most magnificent effects.

But nowhere are the contrasts between French and English churches more striking than in their relative proportions, and in the different relations that height bears to breadth in these structures. For instance, as we ramble about the old Somersetshire city of Wells, we pass beneath a vaulted gate house and enter the precincts of the cathedral. Before us, rich with carving and shafts and arcading, and with those many statues that are unrivaled in similar English work, rises the western front of the great church. Great, do we say? Well, greatness is relative. This whole front at Wells is thirty-one feet wider than that at Amiens, but is only one-half as high, and the nave at Wells is but twice as high as it is wide, while that of Amiens is three times its own width. This vast difference, both in actual height and in the relation of height to width, is further emphasized by the scale of subordinate details. At Wells the church is entered through three small doors that are insignificant features in the rich facade. A man can span those opposite the aisles, and they do not rise much above his head. In France you would find, instead of these humble entrances, grand steps of approach and large triumphal arches lined with rank above rank of sculpture.

THE DARK SIDE OF THE PICTURE.

Some Reasons Why Women Dislike Life on the Farm.

New York Ledger.

A writer whose name is almost a household word in this country, perpetrated the following, the other day, under his own signature: "It is a thing most remarkable to the clear-thinking mind of man that women, as a rule, display a certain unaccountable aversion to farm life. Men do not share this prejudice, for it can be nothing else."

It would be an interesting experience to this man if he could, just for a little while, take the place of some farmer's wife, and find out by actual trial just exactly why farm life is not attractive to women. He would come out of the experiment much wiser than he went in. Only those who have been there can understand just what life on a farm means to the average intelligent woman. If she is a born and bred farmer's daughter she learned in her earliest childhood that she must look after certain things about the place, because the men were busy in the field and hadn't the time to spare. In many instances this, by easy stages, grew to mean that the calves, the pigs, the chickens and the lambs must be fed and watered, the cows must be brought from the pasture, milked, and taken back again or securely housed for the night. The milk, where there is any quantity of it, is the most exacting taskmaster, and tolerates not one atom of neglect.

Cleanliness about the place is the only way to secure the best results in the dairy; cleanliness not only about the milk things, but in the vicinity, for nothing takes up odors so quickly as milk and butter.

Everything must be gotten ready for market, and this falls to the lot of womankind, and it is a weary task that never seems to have any vacation or intervals; and the work is not the worst of the trials of life. The farm woman is as virtually a prisoner as though she were on parole. Most women of this class are not remarkable pedestrians, and there is never a time when the horses are not too tired or too busy to take her anywhere except to market when something is needed for the home.

Sunday is one of the hardest days of the week, as breakfast is always later than usual, and if there are children, they must be got ready for church or Sunday school, as the farmer's family who do not go regularly to Sunday service are apt to be thought not far from heathenish. The whole season is a succession of rushes and there is always something to be put up or packed down or prepared against the coming winter.

One woman was never able to go anywhere during the summer and autumn because she had to pare apples and dry them; another was a slave to chow-chow and pickles, and many a woman has worn her life out in compounding sweetmeats and canning fruit and vegetables for winter consumption.

This is the dark side to farm life, and it is the common one. There is a better side to it, however, and this comes to people who have an income from some business or profession outside of the farm. It is almost an ideal situation for those of moderate means to have a small place under good cultivation, and money coming in from some other source for luxuries. Five acres of ground, with tolerable buildings, and $1,200 a year, will keep a family in the most comfortable and delightful fashion, if the resources are properly utilized. It is persons without outside income that find farming hard and uphill work. Farm produce, outside of the market-garden, turns into cash rather slowly, and the market-garden itself entails an enormous amount of handling and care. Practically carried on, anywhere from two to five acres will furnish all of the provisions of life to a family of half a dozen people, and leave a small surplus for paying grocery bills and the necessary expenses of the place. Of course, there is a season with all farmers that is not productive, and it is this that reduces the general average. When people can so situate themselves that they can grow all of the produce they consume, and have something over to fall back on in that portion of the year when nothing grows at all, they have solved the problem of living. And this problem can only be solved in this way by making the farm and other occupations work together.

GIRLS WHO PROPOSED.

Sonya Kovalevsky Married to Escape from Home Ties.

Century Magazine.

When Sonya was eighteen and Aniuta was twenty-three, the first crisis in Sonya's life arrived. They were again in St. Petersburg. All their intimate friends were imbued with the "advanced" ideas, and longed for more knowledge, in order that they might, in some undefined manner, serve their beloved country. But parents in the higher ranks of life would not allow their daughters to go abroad to the foreign universities to study, and the higher courses of instruction for women connected with the universities of St. Petersburg and Moscow were not yet established. In this difficulty the young girls had recourse to the famous "fictitious marriages," which are usually incorrectly represented as having been adopted for the purposes of revolution and anarchy only. An "advanced" young man and girl went through the marriage ceremony; the young husband escorted his bride to the foreign university of her choice and left her there, or remained to study; but the marriage remained a mere form.

Sonya's sister and that sister's friend resolved to escape from parental "tyranny" by this means. They made their choice of a young professor in the university, whom they knew by reputation only, called on him (in company with the ever-present and admiring Sonya), and proposed that he should marry one of them at pleasure, in order that they might acquire freedom. The girls had made the compact that whichever of them was chosen should take the other abroad for study under the guise of a pleasure trip, to which the obdurate parents would make no objection. The professor gravely declined, and courteously bowed them out. Sonya met him in society fifteen years later, and they had a hearty laugh over the memory of this extraordinary scene.

The next venture of these undaunted girls was, in a way, more successful, though it also had a surprise in store for them. They proposed to a talented young student of great promise, but the proposal was made in society, with far less solemnity than on the previous occasion. To their satisfaction—and horror—he agreed, with a slight change in the programme, which was that he should marry Sonya. As they at once foresaw, General Krukovsky sternly refused to allow his younger daughter to marry while her elder sister was unmarried.

But Sonya was capable of desperate deeds. One evening, just before the arrival of the guests for a dinner party, she stole out of the house, aided by Aniuta, and went to the lodgings of Vladimir Kovalevsky, the young student, and there awaited results. General Krukovsky discovered the absence of his daughter just as the company was about to sit down at table, and in answer to his inquiries Aniuta told him that Sonya had gone out alone (an unheard-of thing, especially at that late hour, in that land and class), and had left a note on her dressing table. Half an hour later General Krukovsky led his daughter and Vladimir Kovalevsky into the dining room and presented them to his guests as betrothed bride and groom.

REAVIS'S BIG SCHEME

AN IRRIGATION PLAN BY WHICH HE HOPES TO MAKE MILLIONS.

Dams Hundreds of Feet in Length, Huge Reservoirs and a Citrus Belt Earlier Than California.

Santa Fe Letter in St. Louis Globe-Democrat.

What manner of man is this James Addison Reavis? He paralyzed a Territory and set it back in growth a dozen years. He enlisted in his service the ablest lawyers of the country. He all but fastened on the government a judgment of between $5,000,000 and $6,000,000. He "touched" men like Collis P. Huntington, the Southern Pacific magnate, for means to carry on his campaign as claimant. And, finally, he made the government spend $50,000, and gave lawyers and experts months of the most difficult work in three countries to run him down. Shortly before he was forced to trial by the refusal of the Court of Private Land Claims to longer delay the trial of the Peralta grant, Reavis wrote to Matt E. Reynolds, the United States district attorney:

"My counsel have all resigned the case simply because it was impossible for them to break off long-standing engagements in order to dance attendance at your caprice. Then shall I suffer in a case of equity wherein the government has been the trespasser, the intimidator, the suborner, the falsifier, the perjurer, the incendiary, and, last, but not least, the server of Mammon, is the question that I put to you square as the only responsible agent created by statute with an eye single to justice, justice to an outraged, down-trodden, conquered people, who transferred their allegiance and souls to its care, and, too, in a civilized age when the cruelties of war are followed by the balm of Gilead?"

Reavis, on the maternal side, is the great grandson of a once famous Missourian, known far and wide as "Corn" Taylor. Mr. Taylor lived in Cooper county. He owned more negroes than any other man in central Missouri. He raised enormous crops of corn on his farms. It was his custom to crib the corn and let it remain two or three or four years until there was a short crop and the price went up. Then he unloaded at the top of the market. This custom, pursued with great success through a long life, brought upon him the name of "Corn" Taylor.

Reavis has traced his genealogy on his father's side back to a much earlier period. At a time when he expected to establish his rights as "Baron of Arizona" to an estate of 12,700,000 acres, he took occasion to hunt up his origin.

"I am partly Welsh and partly Spanish," he said recently. "In early times the Spanish pirates settled on the coast of Wales, married there and raised families. I come of that stock. The name was originally spelled R-i-v-a-s. That was Spanish for pirate.

ANOTHER BIG SCHEME.

Since the close of the trial, resulting in the claim to the Peralta grant being denied, Reavis has given little attention to that matter. It is doubtful if he takes an appeal to the Supreme Court. A project beside which the barony of Arizona was a trifling matter engages him.

"You remember," he remarked, as he unrolled several blue prints, "that just before the trial closed in the Land Court I said that so far as the grant was concerned I didn't care a snap of my fingers for it; that if it was confirmed to me it would be an incumbrance on me the balance of my life? Well, that is what I meant."

Mr. Reavis held up the blue prints of the water system of "the Casa Blanca Improvement Company."

"The capitalists who are interested with me in this enterprise," he continued, "are very glad to have the grant beaten and the land disposed of under United States laws. They feel that way because there is a great deal more for us in the development of a water system and in the sale of water rights than could possibly have been made if we had obtained title to the land."

This rather astonishing overture Reavis proceeded to make clear.

"I will show you," he said, "why it is to our interest to defeat this grant. If we got the grant it would have been impossible to compel people to take the water when they had bought land from us. They could have bought the land and let it lie unimproved as long as they pleased. Now, consider how it will be with the land under government control as part of the public domain. No one man can take up more than 320 acres. To obtain his title he must spend $3 an acre each year for five years under the desert land act. We think that after a man has spent $15 an acre in improving his land he'll not abandon work on it in order to take up and improve other land near him. We are interested in the land being improved, so that we can sell the water to the landholder. For that reason we much prefer the grant should be defeated and the land taken up under the desert land law. But that isn't saying I will not carry the case to the United States Supreme Court."

With that plausible explanation Reavis unfolded the most fascinating irrigation enterprise that ever entered into the mind of engineer or capitalist. The gift of statement which this man possesses is almost beyond comprehension. It is only after hearing him talk that one can comprehend his remarkable success in enlisting the services of the ablest lawyers and the financial backing of the most conservative moneyed men in the Peralta grant. When the government experts came back from Mexico loaded down with evidence of forgery and fraud, they met in Denver a former private secretary of Reavis, and told him what they had found.

"By thunder," said the ex-secretary, "if that man gets hold of you and talks to you twenty-four hours, he'll make you believe that everything you found in Mexico is all wrong."

SOME OF HIS CLAIMS.

Reavis and those associated with him have, if he may be believed, obtained possession of natural dam sites and water locations which will enable them to establish an irrigation system beside which all existing systems are insignficant.

"When I stated in my testimony that I had taken up this water individually," said Reavis, "I meant as against the title to the grant. That title holds in my wife, and she is not included with me in this water development. The water has been taken up by people who live under the flow and who are in this enterprise with me. They have joined me and made the locations under the United States laws. We have covered the reservoir sites. These are natural locations. I have never seen anything to compare with the natural advantages these sites offer. I don't believe there is anywhere else what will compare with these. I have made it my business to investigate thoroughly the water systems of this country. I have also given careful attention to the water systems of Mexico and Spain. There has never been anything conceived that approached this plan of ours. I don't believe there is so much valuable land which can be brought under water anywhere in the world. No grants encroach upon this field of ours, and we are glad of it, because, as I said, we believe the land laws of the United States are better to work under with a water system than grants would be. We don't have to own great bodies of land to preserve the water sheds."

Right here the gray-bearded engineer stopped to refer to the Peralta grant in a peculiar way.

"Do you know," he said, "that no other grant was ever made which encroached upon the boundaries of the Peralta grant as we defined them? Here is all this valuable land, with possibilities of water supply, and yet neither the Spanish nor the Mexican government made a grant to any of it. Hopkins, when he was in the Surveyor-general's office of Arizona, thought that this fact was one of the strongest points in favor of the genuineness of the Peralta grant. It certainly does look as if the early authorities knew of the Peralta grant and purposely refrained from making any other which would conflict with it."

The Baron threw his observation in as purely incidental, and then proceeded with the elaboration of his water scheme. Small ideas have no place in this strange man's brain. The plans of the Casa Blanca Improvement Company contemplate three dams and three reservoirs, all connected and forming part of the same system. The Gila river buttes dam is to be 330 feet high. Perhaps some irrigation expert will throw down the paper at this point with an exclamation of disgust. A hundred feet is as high as the engineers have dared to go with their overflow dams up to this time. The Folsom dam is 100 feet. The San Francisco is between 80 and 90 feet. The Sweetwater is about 70 feet. These are the highest overflow dams of the western country. The trouble in building an overflow dam is that the fall of the water on the outer front, or apron, wears it away, and thus danger of injury increases with the height. Reavis proposes to build a dam 330 feet high, an overflow dam at that, and he has got an idea which will meet the wear of this apron. He will insert in the dam rows of steel tubes passing entirely through it. The first row of tubes will be a little above the bottom of the dam. Successive rows will be put in as the dam grows higher. As the water rises in the dam the surplus will partially escape through these tubes. The water from the lower tubes will fall in jets clear of the dam entirely. That passing through the second row will fall upon the jets from the first row. In this way Mr. Reavis makes the front of the dam a complete apron of jets of water. When the reservoir is full, the overflow, instead of striking and wearing the dam, falls on the successive rows of jets from the tubes. There will be no wear of the front of the dam with this provision, Mr. Reavis believes. He has devised automatic valves for the steel tubes, and believes that he can regulate perfectly the escape of the surplus water. The profile view of this dam, 330 feet high, shows both fronts curved. Here is another of the Reavis theories. His idea is to make the center of gravity of the dam at the same point, whether the reservoir be full, empty or partially filled. By the curvilinear fronts he reduces the pressure because the gravity of the water on the curve counteracts the thrust. It is a nice problem, but Reavis claims he has worked it out; and has produced to a mathematical certainty the proper curve to keep the center of gravity unchanged, as the water rises from the bottom to the top of the dam.

"I always had a taste for mathematics," said he, "and never had to study as others did. When I had once gone over a rule or a principle it was fixed in my mind. I never went back to it. I could calculate the relation of the stars mentally. When my fellow-students got stalled they came to me and I helped them out. That was the way I got my lessons in mathematics. I never studied. If no one needed help on a problem I had no lessons."

MONEY NO OBJECT.

Millions of dollars roll off the tongue of James Addison Reavis as easily as millions of acres. When the Casa Blanca Improvement Company has carried out the plans in full it will have invested $20,000,000, and will have realized $500,000,000 profits from water rights, and will have an income of $35,000,000 from water rents. The water right is sold once for all. The water rent is collected annually.

The Gila river buttes dam will create a reservoir covering 100 sqare miles of territory. It will cost $2,977,508. The reservoir's capacity will be 251,537,873,400 cubic feet, or 5,774,515 acre feet. In irrigation water is measured by acre feet. An acre foot of water means enough water to cover an acre 1 foot in depth. The 5,774,515 acre feet in this reservoir, therefore, would spread water 1 foot deep over 5,774,515 acres.

The second dam of his system Reavis calls the San Carlos. It is to be 300 feet high, and will extend only 96 feet across a natural gorge, costing $2,185,075. The conditions are so favorable that the San Carlos dam will back up water over 207 square miles of territory, and will hold 864,554,432,000 cubic feet, or 19,872,000 acre feet of water.

The Gila river buttes and the San Carlos dams are on the Gila river. The third dam of the system is on the Salt river, and will create what Reavis calls the Tonto Basin. This dam will be 450 feet high. It will cost $3,654,922.19, and will contain 989,600,000,000 cubic feet, or 22,700,000 acre feet, of water. This reservoir will cover 135 square miles.

The figures are given that the reader may see how thoroughly Reavis has worked out the plans, and may receive some impression of the magnitude of the enterprise. When Reavis was on the witness stand he told of the Casa Blanca Improvement Company having already taken from the landholders water notes for $5,500,000, to be good when the company delivers the water, at the option of the givers of them. The counsel for the government got the impression that the validity of the notes depended on the confirmation of the grant. Mr. Reavis says the inference was wrong. The water notes have nothing to do with the grant. They are based entirely on the expectation of a water supply from the Casa Blanca Improvement Co. He mentioned the amount at the trial to give some idea of the scope of this proposed water development, in which he is more interested than in the grant.

"We take out water on a level 1,900 feet above the sea, and we shall be able to irrigate land all of the way from the buttes to Yuma, a distance of two hundred miles. All of the land next to the Gulf of California is citrus, and of a kind to bring the highest price when watered. After irrigating thirty or forty miles from our dam we strike the citrus belt. The advantage these lands have is that the citrus fruits from them come in from one to two months earlier than anywhere else in the United States. Oranges at Phoenix are riper and sweeter the 1st of November than they are in California the 1st of June."

"Two-acre feet," continued Reavis, going on to show where the big profits are realized from water systems, "make the maximum requirement for irrigation in Arizona. The water rates we have taken are made on a basis of one-acre foot, and are for $1.25 an acre. The maximum rent will be $2.50 an acre. The immense income to the water development company isn't derived from the minimum. Suppose a man owns 160 acres and takes water from the company. We sell him a minimum water right for from $5 to $10 an acre, and charge him $1.25 an acre for minimum flowage. That gives him six inches of water on the land in the spring and six inches in the fall. The minimum rate is made low to encourage settlers to take land and develop it. The minimum rate is enough for barley, or any agricultural crop, but for alfalfa and fruits there must be a maximum supply. If a settler develops his land and wants to take the maximum water supply he will be sold a maximum water right for from $50 to $100 an acre, and will be charged $2.50 a year per acre for the flowage. So you can see that it is on the growing demand for maximum rights and flowage that the company will derive its greatest profits."

The Casa Blanca Improvement Company expects to irrigate millions of acres in eastern and southern Arizona, and also to extend its canals and supply into the State of Sonora, Old Mexico. Its reservoirs will drain three mountain ranges—the Mogollons, the White and the Penal—an extent of not less than 10,000 square miles, part of it well timbered, where the snow collects fifteen to twenty feet deep. It will take a tunnel 17,000 feet long, about three miles, to convey the water from the Tonto basin to the place where it is wanted for irrigation.

Apparently deserted by his former friends of wealth and influence, Reavis talks with enthusiasm of this grand scheme. He realizes how difficult it will be to appeal to capital after his trouble with the United States government over the Peralta claim. He has arranged to begin modestly, but with the whole plan in view just as outlined. The Gila river buttes dam is the key. Reavis will begin work on that. He will lay the foundation of a dam to be 330 feet high, when finished. But he will build only 35 feet of it to begin with. On this height he will be able to deliver water for irrigation.

"An investment of $50,000 is all that is necessary," said Reavis, as he rolled up his blue prints. "That amount will raise the dam 35 feet and enable the company to commence the delivery of water. After that the income will raise the dam to 330 feet, extend the system, and furnish the means to construct the other dams."

That is to say, with a cash capital of $50,000 Reavis has figured out an investment of $20,000,000 and a profit of $500,000,000. He talks as if he thoroughly believes what he is saying. No wonder he says he has got "a bigger thing than the Barony of Arizona."

THE COCOANUT TRADE.

How It Was Introduced Into Florida—Its Value and Uses.

Washington Letter in Boston Transcript.

Quite a number of tropical nuts have recently been introduced into cultivation in this country. Already on the east coast of Florida are growing 250,000 cocoanut trees, 42,000 being on one plantation. It is believed that the first trees of this kind in the State sprouted from nuts brought from Central America and the West Indies by the gulf stream. At Key West and about some of the old forts cocoanuts were planted at an early day, as certain ancient trees now standing bear witness. In 1877 a bark freighted with cocoanuts was caught in a storm off the coast of Florida and beached near Lake Worth. Several thousand of the nuts were saved and planted, the satisfactory growth of the seedlings giving an impetus to cultivation.

The first importation of cocoanuts of named varieties was made in 1889, when the Secretary of Agriculture obtained through the State Department two shipments of selected nuts from the Philippines. These, with two other shipments in 1890 from the same islands, comprehended fourteen varieties. To get so many varieties was no easy task, inasmuch as not more than two or three kinds grow in any one district or island of the archipelago, and they were collected by a skilled botanist, who made a tour for the purpose. The nuts thus received were forwarded to growers in Florida. Certain specimens from the islands of Albay and Misamis were of the smallest known variety, which yields little oil and is of inferior flavor. The shells are carved by the natives into beautiful drinking cups. The meat of a variety called "tayomamis" is prepared as a delicious sweetmeat with yams and syrup. Another variety, on account of its extreme hardness, is known as "bahan," which means millstone.

The word cocoanut is derived from the Portuguese "coco," meaning monkey, because the base resembles a monkey's face. The tree was known to the people of Ceylon as early as 160 B. C., the milk being used by them for making cement. The cocoanut is one of the most useful of plants. Root, trunk, leaf, sap and nut are made to yield tribute to man. The fibre of the husk furnishes excellent yarn, and is preferred to horsehair for stuffing beds, cushions, chairs and saddles. It is stronger and more elastic than hemp. The Polynesians twist small cords of this fibre, which serves in the construction of houses and canoes where Europeans would employ nails. The green nuts are grated for medicinal use. Grated cocoanut forms an ingredient of the East Indian condiment, curry. In the Maldive islands labor is usually paid for in cocoanuts.

The chief manufactured product derived from the cocoanut is oil, valued at 7 cents a pound by the hogshead. Most of the cocoanut oil consumed in the United States is manufactured in this country from imported nuts. It is valuable in the making of candles and soaps; it also serves as a substitute for butter. It is used by natives of the Pacific islands for burning in lamps. The kernels of the nuts, broken and dried, are called "copra." One thousand cocoanuts yield five hundred pounds of copra, from which are obtained twenty-five gallons of oil. A good tree yields one hundred cocoanuts annually, worth 4 cents apiece. The worst foe of the planter is the black rat, which builds its nest in fruiting trees and destroys the nuts. To protect the trees against this enemy the trunks are incased in broad sheets of galvanized iron.

JEFF DAVIS'S RICHMOND HOME.

It Is Being Refitted to Serve as a Confederate Museum.

Richmond (Va.) Times.

Work is going on rapidly on the old Jefferson Davis mansion on North Twelfth street, which is being remodeled for the ladies of the Confederate Museum Literary Society with a view of having it put back in exactly the same condition, or at least as nearly as possible, in which it was at the time of occupancy by President Davis and his family during the war. When the School Board took charge of it a number of partitions were taken out on each floor for the purpose of obtaining classrooms large enough to answer the purposes of the Central School. These partitions are being replaced, and by the time the Confederate Museum is thrown open to the public the interior of the building will have almost the same appearance as it did more than thirty years ago, when all eyes of Virginia, and, in fact, of the entire South, were resting on the inmates of that structure.

It has been the wish of the ladies who are now in charge of the building to make the same as nearly fireproof as possible, so that the danger of having the treasures to be conserved in the various rooms destroyed by flames might be reduced to a minimum. This desire is being carried out in every respect by Mr. Henry E. C. Baskerville, who superintends the renovation of the building. All of the wooden flooring of the first and second stories has been removed, and iron beams have been put in its place, which will be connected by terra cotta arches. The arches will be leveled up with concrete and granolithic floors, and a similar floor will be laid in the basement.

The old doors and door trimmings will be put back, and this will be the only woodwork that is to be found in the basement and the next two stories. The wooden stairways have been taken out and their places will be taken by iron ones, which, however, will be an exact reproduction of the old ones in cast iron. The back and side porches, which were constructed of wood, will be remodeled in the same manner as the floors.

The third floor will be thoroughly repaired and put in first-class order, but it will not be made fire-proof at this time. The same is to be said about the roof, but its old wooden cornices will be replaced by galvanized iron, and the same material is to be used for the ventilator on the top of the building. The old stucco on the entire outside of the building has been chipped off and the walls will be restuccoed, while the plastering of the interior will also be renewed. Casts have been taken of many of the old ornaments and cornices, which will be reproduced as nearly as possible.

The entire building will be heated by steam, and the boiler will be placed under the back porch, so as to remove every possible chance of fire from the interior of the building. All the old plumbing fixtures will be replaced by modern ones, in order to make the sanitary arrangements perfect.

Great care has been taken to reproduce the building as it was when occupied by President Davis and his family, and careful measurements have been made of the entire building. There will be five rooms on the third floor, four on the second, four on the first, and five in the basement. All will be used for museum purposes, and it is the intention to set aside one room for each Southern State, but the selection has not yet been made. Under the contract the building is to be completed Nov. 10, and its cost is estimated at $13,500.

When Mrs. Davis visited Richmond the last time, she went all through the building and pointed out the rooms as they were used during their occupancy. On the third floor, the room in the northeast corner was occupied by Miss Winnie Davis, and the others were set aside for visitors and other purposes. On the second floor was the nursery in the room at the east end, and the middle room served as Mr. Davis's private office. The room in the southwest corner was Mrs. Davis's bedchamber, and the one in the northwest corner was her dressing room.

On the first floor was found the dining room in the east end of the building. The middle room back of the large entrance hall and the room in the southwest corner were drawing rooms. The one near the stairway hall, in the northwest corner, was the reception room. The room in the southeast corner of the basement served as a dining room for the children, and the one in the southwest corner was used as a breakfast room. The kitchen was in a separate building.

Christian Chaplains in Japan's Army.

Chicago Record.

The government has decided to send Christian chaplains to the island of Formosa to work among the soldiers and the coolies employed there, and will give them perfect freedom to do outside missionary work at the same time, although general emigration is prohibited as long as affairs are in confusion in that newly acquired territory. A few days ago, when a committee composed of representatives of the various denominations of the native Protestant church called at the War Department to ask the privilege of sending missionaries to Formosa, they were informed that it would be granted just as soon as facilities for transportation could be afforded; that the conduct and services and the influence of the Christian chaplains who had gone to China with the army were so gratifying that the government desired to show its appreciation by offering them the greatest freedom and all the possible encouragement to work among the soldiers.

This reception and acknowledgment were not unexpected, because the Secretary of War and several of the most prominent generals have several times taken occasion to commend the good work of the chaplains during the late war and to express their sympathy in an unmistakable manner.

Emma Abbott's First Check.

New York Press.

I saw a day or two ago the first check ever given to Emma Abbott for singing. She appeared at a church festival of some kind here in New York, for which she charged $100, and accompanying her was a tenor who charged $10. A check for $110 was made out in her name, and she paid the tenor. Mr. Lake first met her at this festival, I believe, and became her warm admirer, her friend and her "angel." It was he who started her out with a company that made her rich. He always had the utmost faith in her. He called her "Honest Little Em," and had the entire second floor of his fine house in Fifth avenue fitted up for her. He was old enough to be her father, and she was a daughter to him. Whenever she came to New York she went to his house, which she soon came to regard as her own. If she appeared in a neighboring city, at Boston or Philadelphia or Baltimore, he always formed a party to go by special train to hear her sing. If I am not mistaken it was Mr. Lake who made the match between Miss Abbott and "Gene" Wetherell.

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