THIRD PART.

THE PITTSBURG DISPATCH.

PAGES 17 TO 20.

PITTSBURG, SUNDAY, MAY 31, 1891.

SECRETS OF THE SKY.

John A. Brashear's Wonderful Instruments for Prying Into Them.

HOW LENSES ARE MADE.

Delicate Apparatus That Measures the Millionth of an Inch.

THE PROFESSOR'S EARLY WORK.

Two Years' Effort on a Twelve-Inch Glass Destroyed in a Moment.

HIS WORLD-WIDE FAME FOR ACCURACY

[WRITTEN FOR THE DISPATCH.]

THIRTEEN years ago, with fear and trembling, I executed one of my first assignments in newspaper reporting. It was to give an account of the observations of "the Southside astronomer" on some important event among the celestial bodies. I knocked at the door of his unpretentious dwelling on Mt. Oliver, fully expecting to be faced by a second Galileo of profound and stern scientific mien. But there appeared instead a pleasant-voiced woman.

"Oh, my husband is not home from the mill yet," she said in reply to my inquiry. "Will you step in and wait for him?"

The mill! My ideas of a Galileo were somewhat modified and I was more at ease. And, presently, when the "astronomer" came in, clad in the ordinary garb of a mechanic, and carrying a dinner bucket, I began to think I had made some mistake. No, I had not, and in a very few moments I had lost the odor of lubricating oil in the interest of what the man was telling me.

Never Courted Publicity.

John A. Brashear was of a remarkably retiring nature. He told me then enthusiastically all about his observations the night before from the roof of his house, but blushed painfully when I turned the conversation upon himself. When we were through, he fairly begged me to not print his name with the matter.

Three days ago I once more sat with John A. Brashear. I found him still the modest, reserved man that he used to be when he was unknown to fame. In the 13 years that have passed all Pittsburg knows his career.

Where Big Spectroscopes Are Made.

They know the story of how his nights, after weary toil in the iron mills of the Southside, were spent in astronomical observations on Mt. Oliver; how his desire to let others know something of the beauties of the heavens led him to write modest contributions for the daily papers; how the newspapers after awhile got to dubbing him "the Southside astronomer;" how Prof. S. P. Langley suddenly discovered the genius of Mr. Brashear in the construction of telescopes; how the celebrated Henry Draper befriended him; how a couple of requests came to him from famous astronomers to make them telescopes; how he tried to do this at nights while still master mechanic in the iron mills, the double strain upon his constitution finally breaking him down; his long sickness, and the physicians' ultimatum in the end that Brashear must give up either

The Telescopes or the Mills;

how he gave up the steady income of monthly wages and afterward scarcely earned a living at the tedious work of grinding optical glasses; how William Thaw, in the interests of science, gave the plucky mechanic such assistance as placed him five years ahead, and how that charitable millionaire, dying, left a special bequest, still in the interests of science, practically endowing the labors of Mr. Brashear; how the telescope maker sought the scientific atmosphere of Observatory Hill, in Allegheny, built a wonderful workshop there, from which have gone out rare and delicate astronomical instruments to all parts of the world.

Yet, this week, it was with great difficulty still that I could get Mr. Brashear to talk about himself. Willingly enough he described to me the process by which his workmen make object-glasses now. I happened to casually make the remark that with these improved processes it seemed to me a very long time was required to make the lenses for a single telescope—from two to six months.

"Yes, it is a long time to work upon one telescope," echoed Mr. Brashear, thoughtfully, "but I have known it to take a great deal longer.

The Astronomer's First Telescope.

"Well do I remember the first telescope I ever had. My education was limited to the village schools of Brownsville, and a commercial college in Pittsburg, so that when I went to work as a mechanic in the iron mills of the Southside I was illy-equipped for the practical study of astronomy. I loved to study the stars, but I found I needed a telescope to push my researches. I was unable to buy one of the size I wanted, so I concluded to try and make one myself. This was 16 years ago. I was engaged at the mill all day, and at night I labored often until morning hours devising my instrument, which I intended to make for 5½ inches aperture. To grind the glass I needed tools, so I first had to make the tools. To polish the glass and make the tube to mount it, I had to have steam power. I therefore built myself the engine necessary to carry on the work.

"My kind wife assisted me. Every evening when I got home from work she would have steam raised in the engine, so that I need lose no time. In this way we persevered, and, sir, it took me three years to complete my telescope. Good while, wasn't it?

Had to Have a Larger One.

"This telescope answered for a while," continued Mr. Brashear, "but soon I found that for my increasing thirst for knowledge about the stars I would need a larger one. So I resolved to attempt a larger instrument. I determined to make it a reflecting telescope. There was remarkably little literature on the construction of telescopes, and what few scientists I communicated with evidently had no time to help me. So I went at it myself again. I worked at nights for two years on a 12-inch object glass, and suddenly one night broke it into fragments while trying to silver it. The toil of two years was destroyed in a moment——"

Mr. Brashear paused. With my notebook on my knee, I was busy penciling out some of the previous memorandum about processes, and, without looking up, I remarked thoughtlessly:

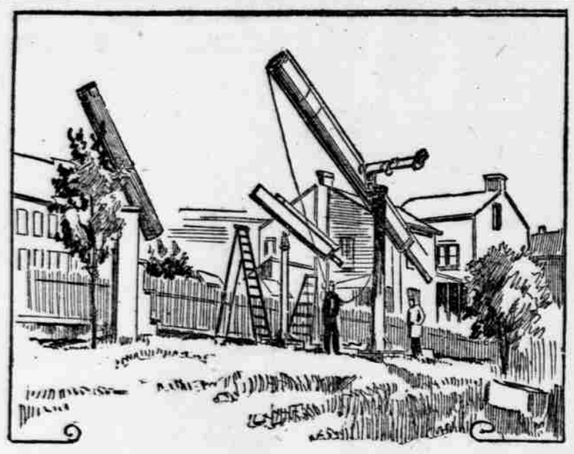
"I guess you don't like to remember that moment, do you, Mr. Brashear?"

There was no immediate answer, and glancing up quickly, I saw an intense quiver on the mechanic-astronomer's lips, which did what the story should have done—touched my heart.

"Ah, no," resumed Mr. Brashear the next moment. "It was the most bitter moment in my life. It took me 24 hours to get over it. But, sir, once over it, I went to work with renewed vigor, and so desperate was I that in one year I had completed another glass—one year! mark you."

Largest Spectroscope in the World.

Just now Mr. Brashear is making the largest spectroscope in the world. A bushel basket would cover the whole instrument, and yet with the assistance of five or six workmen he has been engaged upon it already four months, and it will take two more months to complete it. The enormous telescope in the Lick Observatory of California is fitted with a spectroscope that was also made by Mr. Brashear. Up to its time it was the largest and most perfect spectroscope in the world, but it is now to be surpassed by the instrument on the tables of Mr. Brashear's wonderful little workshop up on Observatory Hill.



TESTING TELESCOPES IN THE YARD.

This spectroscope is for Prof. Charles A. Young, the celebrated astronomer of Princeton Observatory. A spectroscope is used with the telescope to determine the composition of celestial bodies; for the determination of the motion of stars in the line of sight, and for the solution of many other interesting problems in "the new astronomy," as Prof. S. P. Langley calls it. It is one of the most modern of astronomical instruments, its use only having been known for about 30 years past. The spectroscope for Prof. Young will have every conceivable attachment for work of precision in photographic and visual observations.

A Spectroscope for Photographing.

During the present year Mr. Brashear's mechanical genius was enlisted in an entirely new field of astronomical work. Mr. George E. Hale, of Chicago, conceived the idea of making a photographic study of the solar flames. He needed a peculiarly-built spectroscope for the purpose, and experimented for some time to that end. At last, sending his designs to Mr. Brashear, he got that gentleman interested. The Allegheny man worked upon it for many months, and at last constructed a spectroscope of an exceedingly delicate nature, with which Mr. Hale has already been able to obtain good photographs of the spectrum of solar flames. It is a discovery of great importance to scientists.

But Mr. Brashear has about solved another problem of importance. The disks of glass for telescopic lenses cannot be obtained in this country. They are only made in France and Germany. Their manufacture requires a very regular as well as intense heat. In his study of the subject he found that the natural gas while it would supply the intensity was not sufficiently uniform in its pressure among Pittsburg glass factories. George A. Macbeth, the Southside glass manufacturer, assisted Mr. Brashear in his experiments, and the outcome is that Mr. Macbeth has agreed to build an optical glass factory in the natural gas belt in Indiana, which is noted for its regularity of pressure, and Mr. Brashear has contracted with Feil, the noted telescope maker of Paris, to come here and take charge of the factory.

The Mathematics of the Glass.

These disks for telescopic lenses as they are received from Europe are in their rough state. For instance, if Mr. Brashear is building a telescope of anything over 12 inches aperture it requires from two to six months to finish the lenses themselves. The work is most delicate. With each disk the European manufacturer has sent a prism made from the identical pot of glass from which was cast the disk. This prism is studied with the spectrometer in order to learn the optical properties of the two glasses, flint and crown. The curves of the disk intended for the objective are then computed from this prism. The mathematics involved in such a study as this are of such a difficult character that few men in a generation are competent to work them out. In this part of the work Dr. Charles S. Hastings, of Yale University, is associated with Mr. Brashear, and his knowledge of mathematical dioptrics is known all over the world.

The grinding on the disk in the workshop at Allegheny follows the calculations and this is continued with rough iron tools until the approximate mathematical computations are fulfilled; the final grinding is done with accurately prepared glass tools, working with emery of the finest possible washings. The curves of the lenses have to be measured from time to time with a delicate instrument called the "spherometer." It will measure to the one one-hundred-thousandth part of an inch, and in the hands of an expert workman it often measures much smaller fractions than this.

Delicate Work of Polishing.

The polishing of the disk is the next step. It is a beautiful process, the polishers being made of pitch and the polishing powder used is per-oxide of iron. For this work Mr. Brashear has devised some curious machinery, to be seen in no other part of the country. During this polishing process the polishing machine has to be carefully watched. The change of the fifty-thousandth part of an inch upon the curves of the lens would seriously affect the astronomical performance of a large glass.

Such a small quantity as that even is large when the glass is to be tested subsequently by Foucault's method. Mr. Brashear sets the object glass up before a large plain mirror having no error greater than the two-hundred-thousandth part of an inch. The light of an artificial star is then allowed to fall upon the objective, pass through it and be reflected back by the perfect mirror behind it. As the cone of rays comes back to a focus it is cut off by a knife-edge, when every little imperfection in the curves or other existing errors are instantly brought into view. So delicate is this test that errors as small as the five-hundred-thousandth part of an inch may be detected. After the glass has been brought by repeated workings to an accurate curve, it is then necessary to center it; that is to say, the edge, or circumference, must be of absolutely equal thickness in very part, so that the light, when passing through the glass from a star, shall all fall on the same focal plane.

Irregularities in Density.

Many difficulties surround the construction of an object glass. It must be perfect in the fullest sense of that word. Unless it stands two severe tests all the optician's work upon it would be lost. The first of these is to examine the glass by an Iceland spar prism and tourmaline. If there is any unequal density in a glass this instrument will at once detect it, and if improperly annealed it will show it by a remarkable series of irregular figures, both black and white, which condemn the glass at once.

The next test is to examine the glass for impurities. To accomplish this a screen is placed over a lamp, and a hole cut in the screen. The light from this hole is passed first through a condensing lense and then through the glass intended for the objective. It will instantly bring out any imperfections existing in the glass, and if possible these imperfections are ground out.

Another serious drawback to all optical work is changes in the temperature. Tests to ascertain imperfections in the glasses cannot be conducted in an ordinary apartment, or out of doors, for the reason that the weather is so variable.

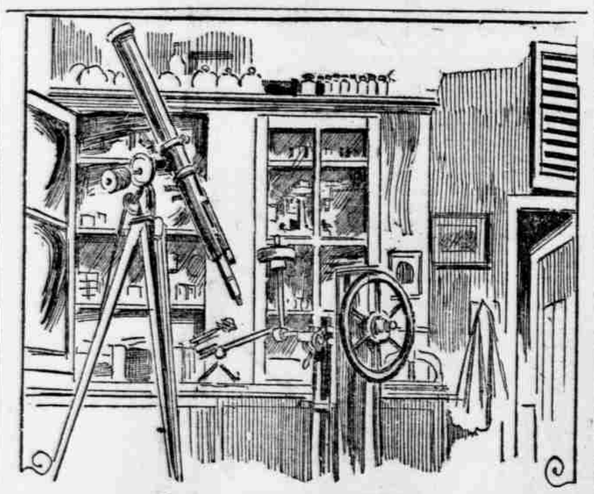
An Underground Apartment

must be used entirely. As built under Mr. Brashear's shop, this cave, or cellar, is surrounded by an air space of 18 inches, and the temperature there has been known to change but three degrees in a whole month. It is also absolutely necessary that no tremor interfere with the experiments, or at least that it be reduced to the minimum; therefore every part of the testing apparatus is isolated from the building, and so perfect are the conditions that the makers know more about the objective glass down in that dungeon than they ever can know in the outside world.

This may cause the reader to wonder how these glasses are protected from the ordinary changes of the weather when they are in transit from the manufacturer's shop to the astronomer's observatory. In shipping large object glasses Mr. Brashear always mounts them in steel cells, because steel is very nearly the same in its expansion and contraction as glass. Great care is taken in the shipping. The glasses thus mounted are packed in some springy substance. When the object glass for the great telescope in Lick Observatory was carried across the continent from New England to California, it was known that it would pass through every gradation of climes. An entire freight car was engaged for the single disk of glass, and it was suspended in the center of the car. It made the journey in safety. When all else is done the object glass is studied with a spectroscope so as to understand its color correction.

Half an hour after leaving Mr. Brashear's shop I took intense delight in standing down at the Fort Wayne Railroad crossing on Federal street and drinking in the dimensions of a modoc locomotive. It was exhilarating, and served to expand my ideas of size after lingering most of the afternoon among devices which could measure the two-millionth part of an inch.

L. E. STOFIEL.



DEVOTED TO SCIENCE, NOT DOLLARS.

REVEL OF REPTILES.

Death Valley Alive With Wriggling Things When Night Falls.

SCORPIONS BATTLE TARANTULAS,

While Lizards and Serpents and Horned Toads Seek Their Prey.

WONDERFUL FORMS OF ANIMAL LIFE

[WRITTEN FOR THE DISPATCH.]

The Government expedition to Death Valley is bringing forth its first fruits. Large consignments of dead creatures illustrating what it has thus far accomplished in the study of the life of that amazing region have reached the Department of Agriculture at Washington. The collections thus far sent there include 2,368 mammals, beside numerous birds, reptiles, insects and other specimens. It is desired by the scientific authorities in charge to find out just what animal and vegetable life is able to preserve existence under conditions so extraordinarily unfavorable as are found in this desert of horror, the like of which is not found anywhere else in the world.

Of plants there is scarce anything to be discovered beside cacti, which only represent a sort of vegetable half life, and clumps of chapparal that are gray instead of green. One sort of cactus that grows to be five or six feet in height, with extended branches, is called the "Dead Man," because each stalk in the night

Looks Like a Corpse

by the wayside. In rare spots where the water has gathered may be seen a singular fleshy bush without leaves and with thick green stems. Such vegetation as there is is rank and spiny, its gray or dull olive hues harmonizing with the parched and barren aspects of the great alkali crust, extending north and south between two precipitous walls of mountains, the Amargosa and Panamint ranges. It is beyond human powers of description to picture the wholly unnatural scene to be beheld here—the vast stretches of white plain variegated with black lava, the alluring mirages, the strange appearance of the towering hills outlined like the backbones of monstrous beasts against the yellow sky, the total absence of trees, the dearth of animal life, and the intense heat, from which there is no escape. Here and there, too, are pebble beds miles in extent, made up of agate, moss-agate, chalcedony, jasper and obsidian.

This astonishing design, however, is by no means so devoid of life as its aspect by daylight would lead the observer to imagine. As soon as night falls it is all aswarm with creatures of various sorts.

Scene for Dante to Picture.

Countless lizards come out of their burrows to look for insect prey; snakes wriggle across the alkali crust; horned toads creep about, and scorpions and tarantulas of enormous size sharpen their claws for combat. Rats, mice and squirrels trot about in active pursuit of game, and wildcats and coyotes forsake their lairs on the mountain sides and roam over the plain in pursuit of all sorts of smaller mammals. It is a nocturnal population, simply because the heat is so great as to forbid going out in the daytime.

The Death Valley expedition has not attempted to encamp upon the desert itself for the sake of securing specimens. It has been obliged to content itself with pitching tents about the edge, at the foot of the mountains, making brief expeditions across the torrid plain, setting traps, and returning as quickly as possible. By this method the traps could be emptied and set again without much loss of time. Time is of consequence in Death Valley, where a man requires two gallons of water daily to keep him from dying of thirst, and even thus is a sufferer.

Traps Used by the Scientists.

Little traps of very simple and most admirable pattern are employed for catching the small mammals. Two or three dozen of them can be conveniently carried in the pockets of one's coat, and the game can enter from any side. Each one is hardly more than a wire spring, ingeniously contrived, so that the quadrupal victim is not obliged to enter a hole, sees no danger, and does not dream of peril until he is caught. Cornmeal is used for bait, and is found most fetching.

For the large mammals the gun must be brought into requisition, while the reptiles, usually slow of movement, are readily gathered in. Of the birds there are very few in the neighborhood of Death Valley, though the raven, that funereal fowl, is very plentiful in the woods that skirt its edge, crying with mournful notes for the many travelers whose dried corpses are scattered over the burning level.

As quickly as possible after they are caught the animals trapped and shot are skinned by the explorers, all of whom are skilled taxidermists. No great pains are taken with the stuffing. A lump of

Raw Cotton Supplies the Vitals,

and the tail is extended by a wire thrust through its length. Arsenic is sprinkled all over the inside for preservative purposes, and the specimen is stretched with four pins on a board to dry. As soon as they have thus been made ready the preserved creatures are forwarded to the Department of Agriculture at Washington. Supply wagons travel constantly between the expedition end the nearest outposts of civilization to get provisions and convey mails.

A great many individuals of each species found have to be killed and forwarded, because individuals here and there differ, and it is necessary to determine where these individual differences end and new species begin. For example, one kind of rat may have ears of various sizes and different lengths; but it is requisite to find out the line which separates this animal from another species.

Thus far the animals sent to the Department are merely such as have been found in Death Valley, because the expedition has been availing itself of the cool weather in that region. Now it has retreated to the mountain slopes, and it will not be possible to conduct any further investigations on the torrid plain until late next autumn.

A Squirrel Who Hustles at Night.

Nearly all the creatures found in the valley are nocturnal in their habits. Among them are three species of ground squirrels, which live in burrows and feed at night upon roots, leaves and seeds of plants. One of them often climbs the stalks for the purpose of getting at the seeds. At other times it stands on its hind feet, clasps the stems with its fore paws and bites off the seed-pods, distending its cheek-pouches enormously with the food. One fellow shot by Dr. Morrison, chief of the expedition, had 39 unbroken seed-pods in his pouches.

Another most interesting animal that inhabits Death Valley is the "kangaroo rat," which makes its way about by jumping. It has long and powerful hind legs and a surprisingly long tail. Its coloring varies from light gray to dark brown, according to whether it frequents the alkali or the lava, nature intending to protect it from capture by the likeness of its hue to its surroundings. The kangaroo rat lives in burrows, as does likewise a smaller kind that is commonly called the "kangaroo mouse." But neither is in any true sense a mouse or a rat; they belong to families quite different.

Rats the Digger Indians Eat.

Nevertheless there are plenty of real rats in Death Valley, as the expedition has found. One kind that lives in the chapparal, with bare tails and exquisite soft fur, is the staple food of the Digger Indians who dwell in the mountains thereabout. The latter catch the mammals with dogs, frightening them out of their nests, which are made like those of squirrels, of great size, in the bushes or bunches of cactus.

With respect to the kangaroo rats, one extraordinary point should be mentioned relating to a certain development of their skulls, which bulge out at the sides in a surprising way. In fact no such bulges as these, which contain the hearing apparatus, are to be found in any other known animals.

One of the most curious sorts of rodents common in Death Valley is the "scorpion mouse," which lives almost wholly upon scorpions. By the "instinct," which means experience inherited through generations, it has learned which end of its prey to tackle. Another creature in the same region that likes scorpions also is the "chapparal cock," which gobbles them by thousands, and is not less fond of centipedes, tarantulas, lizards and horned toads. The last named are too big to swallow at a gulp, and so the fowls tear them to pieces before devouring them.

A Mouse Women Might Admire.

Perhaps the most beautiful mouse in existence is found in Death Valley and is known as the "grasshopper mouse." It is a lovely animal, fawn-colored in the back, with a snowy belly and sides, a short tail and pretty little ears. Other mammals are "pocket mice," with pouches outside their throats to stow provisions in, gophers, weasels, shrews and a newly discovered species of lavender-gray fox with long ears. A wonderfully big species of coyote has been found in the valley. One funny thing about this kind of animal is that it is enormously fond of watermelons, but it has to starve for them in the locality.

Only 50 miles west of Death Valley, which is 150 feet below the sea-level, Mt. Whitney, the highest mountain in North America, uplifts its mighty peak, covered with perpetual snow, three miles into the air. Thus, within a day's journey of each other, the lowest and the highest points on this continent are found. Dr. Merriam wrote the other day that he had breakfasted on 20 feet of snow and was composing his letter to Secretary Rusk, at 4 P. M., in an altitude of rather less than nothing and a temperature of 110° Fahrenheit in the shade.

Mt. Whitney a Tough Customer.

The expedition would be very glad to ascend Mt. Whitney, but the task is likely to be an impracticable one. Above there are depths of snow which are continually precipitating themselves in avalanches on the lower slopes, and the dissolving ice has reduced the ground to the condition of a hopeless morass, through which travel is altogether impracticable. There is no path up the mountain by which even a mule could journey.

In the region described is to be found a most astonishing opportunity for the observation of a traveler, inasmuch as within 50 miles he can pass through all the life-zones of the earth, from the hottest tropic to the frozen Arctic, and view not only the vegetation but the beasts and birds of the various climes traversed. It seems very strange to find upon the summits of Mt. Whitney, the San Francisco mountain and other peaks scattered over the warmer parts of the earth, small colonies of veritable Arctic life, both vegetable and animal. But this is explained when it is realized that during a period immediately preceding the present, and known as the "glacial age," the entire northern part of

The World Was Buried in Ice,

the icecap, which in places was several thousand feet in thickness, extending southward as far as Philadelphia and below Chicago. When this vast cosmic glacier receded, many Arctic plants and creatures were stranded in lofty mountains, where at sufficiently lofty altitudes the temperature never became too high for the continuance of their existence. For an example, the San Francisco mountain in Arizona is an extinct volcano, inhabited by plants and animals which could not possibly have reached it since the glacial period. Though an isolated peak rising out of a vast and burning desert, its snowy top is a veritable Arctic colony.

RENE BACHE.

THOUGHT HE'D STRUCK OIL.

Joke on a New Jersey Nabob Who Drove a Well in His Back Yard.

[New York World.]

A New York business man who lives in Elizabeth, N. J., started last fall to sink an artesian well on his premises, and thought that, for the sake of exercise, he would do the job himself. Accordingly every night, after returning home from the city, he would repair to his yard with a big sledge and there pound vigorously on the iron pipe for half an hour, screwing on section after section as the work progressed, and putting on a pump occasionally to see if he had struck water.

A few weeks after a neighbor whose yard adjoins the well-borer's premises was surprised to notice a heap of earth among his plants, and he noticed that every time his neighbor in the next yard would strike a blow with his sledge on the pipe he was driving the pile of dust was visibly agitated.

Procuring a spade he dug down into the heap of earth, and the spade soon struck a metallic substance which, when uncovered, was found to be the end of an iron pipe with the pointed boring tool attached that is used in driving a well. The point of the pipe had evidently encountered a rock, sheered off in another direction, and finally, as the driving progressed, it came out in the adjoining yard. The man who made this discovery took a friend into his confidence, and together they made up their minds to have some sport with the well-driver.

They unscrewed the pointed cap on the end of the pipe, and procuring a gallon of kerosene poured it into the hollow tube. The well digger attached his little pump that evening, as usual, to ascertain if he had struck water, and to his astonishment found he had struck oil. He could scarcely believe it at first and the conspirators, who had been watching his movements through a knothole in the board fence, poured in another gallon, which fully convinced their dupe that he had a bonanza.

He rushed into the house and acquainted his family with the joyful news. The following evening the conspirators saw him come home from New York with three well-dressed men, apparently brokers. He took them into his yard and, rigging up his pump, proceeded to show them his remarkable discovery of an oil well in Elizabeth. The pair who put up the joke on him at once poured in an extra gallon, and as the oil in its passage through the pipe became discolored it strongly resembled petroleum. The strangers smelled the stuff, and, after examining closely, became satisfied that it was the genuine article and informed the owner of the well that his fortune was made.

When the succeeding night they saw their victim bringing more men from New York to inspect his big find they thought the joke had gone nearly far enough. The man who suggested the joke put his mouth to the end of the pipe and shouted through the hollow tube: "You're a lot of blankety blank fools!" The sound of a voice proceeding, as it were, from the bowels of the earth, startled the group around the well so much that they stood rooted to the spot in terror for a couple of moments. When they recovered from their fright they looked at each other in amazement until the shrieks of merriment proceeding from the next yard convinced them that they were the victims of a hoax.

Frightened to Death by Thunder.

During a terrific thunderstorm at Atlantic City recently Mrs. Mary Carroll, a colored woman, 35 years old, was frightened to death. She was found after the storm on the porch of Beyer's Hotel. Dr. Eugene Reed said death was due to fright.

The Fad of Heresy.

[New York Herald.]

They are going to try Dr. Briggs for heresy on account of the Eden episode. He insists that Adam and Eve ate a banana, and that the fall was due to their carelessness with the peeling.

BEAUTIES OF INDIA

Held Captive in Poems of Marble at the Zenana of the Nizam.

MRS. POTTER RECITES FOR THEM

And Describes How the Magnificent Creatures Appreciate It.

THE HANDSOME PRINCE AND HIS WIFE

The Nizam of Hyderabad is the richest independent prince of India; his dominions are larger than France and have double the population. Mrs. James Brown Potter has taken a peculiar interest in the beautiful inmates of the Zenana of this powerful prince, and on his invitation she recently appeared before them. Extracts from letters written by her to her friends in New York, and published in the *Herald*, of that city, give the following description of her visit:

Mrs. James Brown Potter.

On the right as we entered the inner court and covering an area, I should say, as large as the Fifth Avenue Hotel, is the zenana or harem, which had when I saw it 400 inmates and was also the residence of the Nizam's wife. Naturally enough I appreciated the honor that this great prince did me when he asked if I would recite in the courtyard of the zenana, in the presence of himself and his wife, and near enough to the women for me to hear the rustle of their robes and to see now and then, through the meshes of the fairy-like marble screens, the flash and flutter of their great, soft eyes.

Rare Beauty of the Interior.

The zenana has a little courtyard of its own, around which on four sides rise galleries of marble supported by columns of what appeared to me to be mosaic. In the center of the court a great fountain threw a jet of perfume water to the height of at least 40 feet. Above the court was open to the sky; below the mosaic pavement, of exceedingly ingenious patterns of colors as glittering and bewildering in their brightness and contrasts as the kaleidoscope itself, was dotted here and there by divans and cushions and shaded by palms, a large number of which appeared to be growing here.

The marble screens, behind which the beauties took shelter from my eyes, had delicate meshes which seemed almost pliable and as light as a feather, so minute were the designs of their tracery and so delicate their outlines. Each of these screens alone represented the labor of years, I am told, but after all what does that amount to in a country where even the skilled labor of a marble worker commands not much more than 5 cents a day! The high class Moslem women are never allowed to be seen. They lead the most desperately dull lives. If their faces are only once even seen by men outside of their own blood relations, they are, according to the Koran and the customs of their country, disgraced forever. I have seen these beautiful creatures covered with lovely jewels, loaded with wealth, decked in the most magnificent scarfs and silks, in all the great zenanas of India, but can they be happy?

Poems in Marble and Flesh.

Ascending the marble stairway on the right, after entering the zenana, we reached the first balcony, on which were the private rooms of the princess. From these we proceeded to the gallery above by another curiously carved stairway. A hundred women, most of them young, and all that I saw at least beautiful—according to the Indian ideas, which highly esteem avoirdupois—have apartments on this balcony. I went no higher, but I understood a hundred more were quartered on the balconies above. The hopeless isolation of these lovely creatures for whom nature has done so much and man so little impressed me painfully as I sauntered from one apartment to the other under exquisite doorways of marble, through curtains whose fabric was so delicate that any one of them might almost have been drawn through a finger ring; over mosaics whose patterns and finish would alone have attracted crowds of the curious in our country, and watched them as they lazily roused themselves to a sitting position on their cushions and with a faint flush of curiosity and interest in their dusky cheeks and oxlike eyes seemed almost about to make the effort to inquire who I was and what I wanted.

I asked what they ate, and was told rice and sweetmeats, rice and sweetmeats, nothing but rice and sweetmeats. They had sherbet to drink when they were thirsty and their cushions to sleep upon when they were sleepy. Food, drink, slumber, the desire for fine apparel and glittering jewels, which were undoubtedly theirs—these seemed the sum and limit of their wants.

The Nizam Is an Apollo.

The Nizam himself has a most impressive physique. I should say he was one of the handsomest human beings I ever met—tall, athletic, yet spare of frame, deep-chested and long-armed, grave almost to sternness, yet as courteous as a cavalier of the olden times. The Nizam was awaiting me when I returned to the courtyard. Messengers were dispatched through the galleries of the zenana to inform the inmates that in ten minutes I would recite for them.

By and by a soft flutter of silky garments was heard on all sides, and I became conscious of being the target for hundreds of bright eyes which peeped at me over the marble balustrades and through the interstices of the queer stone lattices. A carpet was spread upon the mosaic, or rather, a rug about ten feet square, and standing on this, facing the Nizam, who followed all my movements with grave interest, I began by reciting—what do you think? "The Pride of Battery B." Of course, they didn't understand it, but I felt irresistibly impelled to get in touch with them, so to speak, by degrees. When I finished there was a painful pause and then a little rustling of gowns again and subdued murmurs on all sides.

Three of the women—daughters, as I learned, of three of the Nizam's most powerful subjects and themselves princesses by birth and blood—were permitted to sit on a divan about ten feet to my left, a marble screen about four feet high having been put between me and them. Now was the time when I had resolved to make my coup, if at all. I did the mad scene from "Romeo and Juliet," and I know that my auditors had never seen anything like it before—that is, the women at least—for they say the Nizam himself had seen everything and done everything.

Melted by Juliet's Woe.

As I dragged myself across the carpet to take the poison vial from the fingers of my imaginary *Romeo*, simulating the mingled love and agony of the dying *Juliet* as well as I knew how, and better, I believe, than I ever did elsewhere, I was at last assured by the sobs from the galleries and by the undisguised grief of the three princesses on my left that I had touched their hearts. The Nizam himself showed no emotion except the gravest interest. His wife, whom I should be tempted to call a sort of a dummy, played with the rings on her fingers and didn't even pretend to watch me. But the women of the zenana, whose only entertainments up to then had been the dances of nautch girls or the jugglery of snake charmers, had at last been aroused from their torpor.

I did *Ophelia* then and—you would hardly believe it—followed this with "Ostler Joe." I think "Ostler Joe" was much the most affectionate weapon in my repertoire, judging from the sighs and tears with which it was greeted.

Coffee and sweetmeats were served in the Turkish fashion, for the Nizam is a Mohammedan monarch, and I was then courteously escorted to my carriage. Of all my Indian experiences in Calcutta, Bombay, Madras and Hyderbad, I shall cherish my visit to the zenana of the Nizam as the most delightful.

CHAPTER I.

MR. GIRDLESTONE'S HEIR.

In the neighborhood of Bishopsgate Without, and only separated from that noisy street by a narrow lane of lofty warehouses, stands an old square. This square, which is mostly composed of fine mansions, was once the very center of fashion. Here was to be found the ancestral home of more than one aristocratic family; it was here that the Countess of Devonshire—some 200 years ago—lived and died. It was here, as we are told by Stow, the best of old chroniclers, that "Jasper Fisher, free of Goldsmiths, late one of the six clerks of the Chauncerie, and a justice of the peace," built for himself a magnificent residence. He laid out his grounds in regal style with pleasure-gardens and bowling alleys, for his guests to wander in and listen to the songs of birds; even "the Queen's Majesty Elizabeth did lodge there." No wonder, then, that crowds of the nobility and gentry came to visit Jasper Fisher. His hospitality and extravagance might almost be compared to that of an Eastern potentate; a calif could scarcely have been more ostentatious. But "Fisher"—so the story goes on—"being a man of no great calling, possessions or wealth, and being indebted to many," was unable for any length of time to keep up so large and sumptuous an establishment. He retired once more into private life; the place gradually fell into wreck and ruin; and so it came to be called "Fisher's Folly."

One autumn evening, some years ago, a young man entered the precincts of Fisher's Folly and looked keenly about him. At that time the place was the home of merchants, who had their counting houses on the ground floor. The man had the appearance of one who had recently landed from a long voyage: he wore a rough overcoat and waterproof hat; and his fresh complexion and bright eyes spoke eloquently of stiff breezes on a briny sea. His face expressed as he glanced about something more than mere idle curiosity. "I thought I should have remembered the old house," he muttered to himself; "but I was only a lad; and one house was the same as another in those days. I didn't know then what I know now;" and he walked round the square, peering up at the doors and windows and down into the great areas, dismal and deserted and faced by rusty iron rails. Presently he stopped opposite a corner house. It was the largest in the square; it had two windows on each side of its massive door, and five windows on the stories above. In the roof was a low, smoking chimney; and in the deepening gloom this chimney, with a round garret window on each side, had the appearance of a shapeless monster, as it seemed to the young man, staring down over the parapet when he looked up.

As he was on the point of turning away, though the front door of this mansion stood invitingly open, a gleam of light in the windows overhead attracted his attention. He stepped back and stood in the roadway with an eager expression on his uplifted face. The light moved swiftly about, glimmered dimly in the five windows, and presently became concentrated in the one above the front door. In the bow of this middle window, inside the room, stood a large lamp—unlighted. This lamp, raised upon a pedestal, was peculiar. It had the appearance of a lantern suspended under a gilded dome, the dome being supported by foliated pillars. The whole ornament, as far as could be seen at that distance, was a remarkable piece of workmanship. And while the young man stood there looking up, as if the lamp were of exceptional interest to him, the figure of a girl became apparent. The girl, carrying a taper in her hand, stopped before the lamp. The lantern was soon lit; and the brightness from it fell upon her face. It was a vision of beauty—an exquisite apparition of loveliness, upon which the lamp threw a pale subdued light; and then an arm was stretched out, the curtain drawn across the window, and the lamp and lovely face had vanished.

The young man now went up the steps, and found himself in a large hall, with a broad oaken staircase beyond. Upon a door on one side of this hall was written in white letters upon a dark panel, "Girdlestone, Carter & Co." After a moment's hesitation and a glance up the staircase, as though another glimpse of the enchanting face were possible, he opened this door and found himself in a dingy old counting house, where the clerks, five or six in number, were seated on high stools, as if to get light, when any came that way, from the barred and dusty windows behind them. They all looked up when the visitor came in, like so many automatons, and then looked down again.

"Is Mr. Carter within?"

A clerk came forward. "What name?"

"John Westcott."

The clerk opened a door on which was inscribed "Mr. Girdlestone" in faded letters. The room into which he stepped was in darkness; but the clerk lighted two antique candlesticks on the high mantel shelf. He then placed a chair for John Westcott and disappeared.

Westcott's expression of curiosity increased. The room had a mysterious and neglected appearance: there were many signs of its not having been occupied of late. The desk was covered with dust, and dusty cobwebs hung in the corners of the walls and across the chinks in the closed shutters, as though even the spiders had forsaken the place. A few sheets of paper lying upon the desk were as yellow as old parchment; and the ink in a pewter inkstand had evidently dried up long ago, with the tip of a quill pen sticking there, as if the hand that had dipped it had ended the records of a life and had vanished.

John Westcott sat down in the chair—probably Mr. Girdlestone's—facing the old desk. His eyes wandered searchingly into the deep pigeon-holes and over the brass-handled drawers, quaintly designed with the heads of satyrs. Suddenly he glanced up. An antique picture—the portrait of an old man—faced him; it was hanging over the mantel-shelf between the two candles; and the eyes seemed to him to express extraordinary cupidity. Westcott moved from the desk, lifted one of the candles from the mantel-shelf, and, shading it with his hand, examined the portrait with acute interest. "Yes," said he, in an undertone, "it is the face I remember. There is a look of insatiable greed in those searching eyes—in the hollow cheeks and wrinkled mouth. And what expressive hands! Why, yes, they seem to be grasping imaginary gold!"

While he still stood gazing at this painting as if unable to take his eyes from it, the door opened, and the clerk requested

HE GAZED LONG AT THE PORTRAIT.

him to "step this way." The room which he now entered had a cheerful appearance. It was well lighted, and a bright fire was burning in the hearth. Upon the rug, with his back to the fire, stood a somewhat careworn-looking man of about 45 or 50. He stepped forward, however, with a pleasant smile on his face, and held out his hand to the visitor.

"Well, John," said he cordially, "so you made up your mind at last to come to England. You have done well and I am delighted to see you. But what has happened? I have been puzzling my brain ever since your letter came to hand. 'John Westcott,' as I could not help saying to Marian, 'has got some surprise in store for us.' And Marian was somewhat of my opinion."

If a sign of embarrassment crossed Westcott's face as he drew a chair toward the hearth, it escaped Mr. Carter, for that gentleman had bent down to stir the fire into a brighter blaze, as though to give a more cheerful appearance to his welcome, and at the same time to hide the slight tone of reproach in which he spoke. The merchant was evidently one of those men who, when having an unpleasant duty to perform, are glad to get it over as agreeably as possible. The young visitor, after a quick glance about the room, as if reviving his memory as he had done in the square and Mr. Girdlestone's office, quietly remarked: "So it seems strange to you, Mr. Carter, that I should care to revisit my uncle's old home?"

"Indeed, it does," replied Mr. Carter frankly. "I had concluded long ago that no possible motive could induce you to return. Has there not been more than one strong reason during the last 15 years why you should come back? But you have all the while remained abroad." Receiving no reply Mr. Carter went on. "Was there not the prospect of a partnership?" said he. "Did not Mr. Girdlestone, as we wrote and told you, seem to set his heart upon having a relation in the house?—That did not bring you home."

"I had chosen a profession," replied Westcott. "Even the certainty of inheriting a large fortune by working at the desk could not tempt me to retire from the navy. I had a passion for the sea."

"Well," said Mr. Carter, half apologetically, "perhaps I ought not, you will say, express any opinion on the subject. Your refusal to come into the business led to my promotion. Mr. Girdlestone, desparing of getting you to join the firm, made me a junior partner. But was there not another reason, a far weightier one, for a visit to England a year ago? And still, John, you stopped away." Mr. Carter looked, as well as spoke, reproachfully now.

"You mean," said Westcott, steadying his voice, "at the time of my uncle's death."

"You received my letter?"

"Yes; at Madras. You told me that he had left his property—except your share in the business—to your daughter Marian. It is she, as I understand, who is now the senior partner in the old house."

A slight smile passed over the merchant's