

ends of the two cars, and beneath the mixer, is a passageway through which a team of horses may be driven. The operation of the plant is described as follows:

Sand is shoveled from the supply pile into the buckets of the cold sand elevator; by them it is delivered into the sand heater, from which it emerges, very hot, into the boot of the hot sand elevator. By means of the hot sand elevator, the sand is carried up into the revolving screen, where all gravel and coarse particles are removed, and it then falls into the hot sand storage bin, down through which it finally passes, by means of the measuring box, into the mixer. While this sand operation has been going on, the operator at the melting car has opened a valve in a large pipe which projects from the agitator, and has filled a steel bucket with a certain amount of asphalt. As the operator at the mixer lets a charge of hot sand fall into the mixer, the melted asphalt is run from the agitator to the mixer on a short trolley and is poured into the tumbling and tossing mass of hot sand, into which has previously been dumped the required amount of carbonate of lime. The whole batch is then allowed to mix furiously for a short period of time, and then the operator at the mixer pulls a lever which opens a door in the bottom of the mixer, and the whole mass, or batch, as it is technically called, falls into a wagon which stands beneath to receive it. This is the substance that may be seen upon the streets wherever an asphalt pavement is being laid.

The cars upon which this railway plant is established are constructed entirely of steel and are of especial design; they are equipped with air brakes as required by law, and also all other fittings and attachments, including automatic couplers, according to master car builders' standards and regulations. As packed for transportation the plant is of ordinary freight car dimensions and weight and passes all bridges and tunnels. Three of these plants have been built during this summer and their success has been so marked that it is expected that many will be in use in different parts of the country within another year. This railway asphalt plant is manufactured by Hetherington & Berner, of Indianapolis.

VICTORIA REGIA.

Several attempts have been made at Prospect Park, Brooklyn, to raise the Victoria Regia from the seed, but they have failed. The plant illustrated in the accompanying engraving was procured at Philadelphia. It has grown with great rapidity, and now, with its ten leaves, the blossoms and the buds, nearly fills a large lily pond. Our illustration shows the leaves in different stages of development and decay. Several of the leaves are perfect; one or two have broken down around the edges, and a new one at the left is unfolding by unrolling at the edge. The leaves are upturned at the edges like a pan, and underneath is a strong network joined to the stem five to ten feet long. The leaves are four to five feet in diameter. They have been grown to double that size in the Royal Gardens at Kew, where they are grown under glass, and the water in which they are propagated is kept at a temperature of about 80°.

The Prospect Park specimen is growing in one of the out of door lily ponds which is furnished with heating apparatus concealed from view, and arranged to keep the plant at the required temperature. Much anxiety was felt while the bud was developing, lest a chill wind should blast the tender bud, but the weather was propitious and the plant and flower have been seen by admiring thousands.

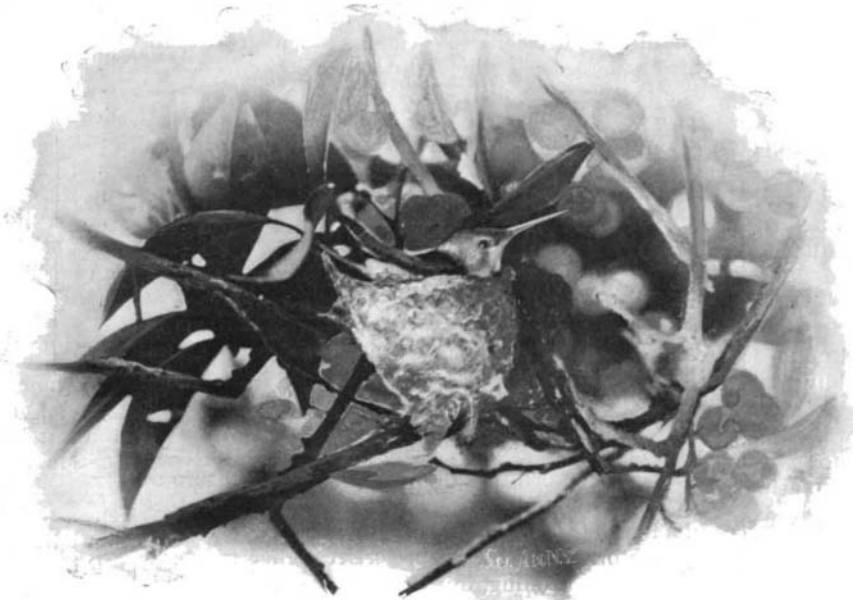
A few years ago we published an account of the successful raising of this plant at Clifton, N. J., by Mr. S. C. Nash. The Victoria Regia is indigenous to inland South America. It was discovered on the Amazon and taken to England, where it was exhibited at the Crystal Palace. It was named in honor of the Queen. This great lily has been known and exhibited in England for fifty years.

THE ancient Greek water supply system showed every modern improvement, such as we have acquired only within the last decade.—Monatschrift für Oeffentlichen Baudienst.

TAME HUMMING BIRDS.

BY CHARLES FREDERICK HOLDER.

In Southern California almost every dooryard and garden has its quota of humming birds—among the most interesting of the feathered tribe. I recall hearing John Bell, the taxidermist and naturalist, who was a friend and companion of Audubon, say that he once heard a humming bird sing when lying perfectly quiet beneath a bush. He considered it a novel occurrence, but the humming birds of Southern California certainly utter many notes which may be construed into singing.



THE TAME HUMMING BIRDS OF CALIFORNIA.

My first experience with these little creatures was on the slopes of the Sierras between two deep and well-wooded cañons.

In a little garden belonging to one of the sons of John Brown, whose "soul is marching on," many humming birds congregated, flying from bush to bush the whole day long, glistening and gleaming in the sun like living gems.

One day, when strolling through this semitropic garden, I saw a little brown humming bird watching me gravely from the broken stalk of a wild sunflower. As I gradually drew nearer, it merely cocked its head upon one side and gazed at me in a mildly inquisitive manner until I was within two feet of it, when it flew away twenty or thirty feet. Again I approached quietly, and succeeded in obtaining a position within a foot of the little creature, who appeared fascinated and entirely devoid of fear. I now carefully reached out my hand around it. The little head slowly followed until its gaze was wholly directed from me. Then with the other hand I caught the dainty creature, hoping to keep it as a pet. It was released in a large room, with an abundance of sunlight and flowers, but it became at once so wild and was obviously so unhappy that I gave it its freedom.

My next attempt at cultivating a friendship with a

impossible creatures took their place; bits of animation which at the slightest movement opened their wide and cavernous mouths for the expectant food. The little birds, which first resembled hairy spiders more than anything else, soon obtained their feathers, and eyed us with gentle curiosity whenever we approached the nest. A rich sirup of sugar and water was now offered them, and found to be very much to their fancy. A drop upon the end of a broom splint would at once become the target for their slender tongues.

As it became evident that the birds would leave the nest in a few days, the delicate structure was severed from the branch and removed to the room of one of the ladies of the house, who now undertook their education. The little creatures almost immediately deserted the nest, taking position upon its edge, with much unsteady fluttering. Then began the first experiments in flying, a rapid vibration of the wings, which merely raised the birds a few inches above the nest. This was succeeded soon after by a short excursion into the air, following the drop of sugar, taking it upon the wing from the hand of their mistress just as they would when feeding from a flower. Two or three experimental days and the birds became perfectly tame. They would alight upon the finger or head of their mistress, come when called, and displayed the most artless and confiding dispositions.

When the nest was taken the mother bird made no protest, in fact, was not seen, but she soon found her off spring. The young birds, two days later, having learned the use of their wings, flew to the window that faced

the orange grove and clung to the meshes of the screen with their tiny, delicate claws. Their plaintive squeaking soon attracted the attention of the mother bird, who hovered about the place for several days, endeavoring to reach her imprisoned young, reluctantly flying away whenever one of the household appeared.

It would be impossible to conceive greater confidence than that displayed by the little captives. They were absolutely without fear and courted the closest intimacy. At night they slept on the edge of a basket in a closet in our room, and every morning awakened us by hovering over our faces, uttering sharp little metallic notes; when successful, alighting upon the extended finger, cocking their tiny heads from side to side in an expressive demand for food. At breakfast they frequently flew downstairs, following their mistress, often perching on the sugar bowl or some convenient roost on the table, from which they would watch the proceedings apparently with the greatest interest. The little creatures, hovering in the air and feeding from our hands, presented a charming spectacle.

When called, the pet bird would fly from room to room, evidently understanding its name, and was a constant surprise to lady callers, unaware of its presence. A humming bird, in the family of a friend of mine, met its death by being taken for a gigantic bee. It flew to the gorgeously decorated hat of a visitor, humming about the artificial flowers and following them up as the guest attempted to escape. The latter, finally, struck it down with a fan, only then discovering, to her surprise and dismay, that the supposed insect was a pet humming bird.

Who first conceived the idea of taming so delicate a creature as the humming bird is not known, but it has frequently been done. Old habits of Taylor's restaurant, on Broadway, will recall the tame hummers which at one time were exhibited in the window and which attracted the attention of hundreds of passers by. The birds were thoroughly tame, and knew the German who caught them perfectly. He fed them by using glass flowers, which were filled with sweetened water.

The question as to the food of humming birds is one that has aroused much discussion, some authorities stating that they live entirely upon the sweet exudations of flowers, others believing that insects form part of their food. I can state that the California ruby throat cannot, in my experience, live on sweetened water alone. It requires minute insects, and, perched upon the fingers of their mistress, our little pets would eagerly hunt for insects on the window pane. Ants they would not notice, but very small gnats and spiders were very much to their liking. I assume that their



VICTORIA REGIA IN BLOOM.

humming bird was with two young birds, a nest and eggs having been discovered on a low branch of an orange tree in my garden. The mother bird was very loath to desert the eggs when I approached and readily submitted to the photographing process, the plate showing the little creature sitting high on the nest, her beak pointed slightly upward. When any one went near the tree the bird did not make the slightest movement, evidently relying on the protective resemblance which she and the nest possessed to a remarkable degree.

Finally, the two eggs disappeared and two reddish

food consists mainly of these and other insects, the sweetened dew and exudations of flowers being their drink—a nectar to be enjoyed, perhaps, when other food is scarce.

While but one humming bird is well known in the East, California has seven or eight, most of the genus *Trochilus*.

While the humming birds are the most delicate of their kind, their powers of flight are marvelous. A friend informed me that he observed one flying about the vessel that plies between San Pedro and Santa Catalina Island, twelve miles from land. This island is famous for its humming birds, and here and at San Clemente, forty miles offshore, is found the beautiful white-booted racket-tailed humming bird (*Steganurus*).

The art displayed by the humming birds in building their nests is marvelous. The one from which the young birds described were taken was not much larger than an English walnut, formed of the most delicate material, like floss from seeds, and covered on the outside with bits of moss, so that it resembled in texture the branches of the orange tree and was very difficult to see.

At Santa Catalina these birds affect the eucalyptus trees and can be seen about their blossoms in flocks of a dozen. While watching one of these birds I noticed a remarkable performance. The bird rose rapidly to a height of perhaps thirty feet, then plunged down, forming half a circle, uttering a peculiar whistling sound. This was repeated several times, the noise being remarkable. I conceived it to be a part of the courtship of the bird, as several female humming birds were hovering about the spot.

The Development and Toning of Lantern Slides.

Mr. Alfred Stieglitz, of this city, a member of the Camera Club, describes in "Camera Notes" a method of development somewhat unusual. In exposing in the camera the plate is slightly overtimed, then it is developed preferably with the hydroquinone developer until the image totally disappears when examining the plate by transmitted orange light, that is, the image is so dense no light can pass through the plate. It is then rinsed under the tap as usual, and placed in the hypo bath until thoroughly fixed. Upon examining the fixed slide, it will be seen that it is not only so thick that you can hardly recognize the picture, but that it lacks all gradation, in being muddy and flat. But this condition is necessary for future operations, all of which take place in broad daylight. On a table place two white porcelain dishes. The one, which we distinguish by calling it A, should contain a one per cent solution of ferricyanide of potassium and the other, B, a very dilute solution of hyposulphite of soda and ferricyanide of potassium, say:

- I. 10 per cent solution of hyposulphite of soda.
- II. 10 per cent solution of ferricyanide of potassium.

For use, take 100 parts of I and 15 drops of II.

These baths must be renewed occasionally, as they deteriorate in the light.

In each dish place a small camel's hair brush and a wad of cotton, which latter may be shaped at will to suit the purpose for which it may be intended. If possible, have the table near running water; otherwise have a pailful at hand, as plenty of water is essential for the delicacy of some of the operations to be performed.

Local Reduction in Order to Build up Tone Values.

—As before stated, in examining the fixed slide by transmitted light, very little of the image will be visible. In order to facilitate matters, bring the slide directly from the fixing bath, without previous washing, into dish, A, in which it will be gradually reduced. Stop the reduction as soon as the image is fairly distinct. This is done by plunging the plate into water, thus stopping all chemical action. The slide is still very thick and flat, but it is now in a satisfactory condition for local treatment and the ultimate thinning down to the desired density.

In this state the slide is placed in dish, B, and local reduction by means of the brush is begun. This process must be very gradual, so that it be in our power to alter our relative tone values or gradation at will. You notice in this local application of the reducing agent we in reality have the reverse of brush development in platinotype printing, with even a much greater leeway. The process of producing slides by this method is highly interesting, for effects not otherwise possible can, with a little skill, be obtained.

It is by this method that some of those striking snow scenes, shown during the winter, were produced. Originally the slides of these were considerably overtimed and overdeveloped, and then reduced in the above described manner. Between every stroke or two of the brush it is well to rinse the plate, so that the strokes do not show in the ultimate result. No brush strokes ought to be visible when the slide is thrown on the screen; if any be detected, the slide is a failure and ought to be discarded. With a little skill and practice this method is very simple and safe, and any one having succeeded in mastering it will never resort to any other method of producing slides.

Naturally, it is essential to know something of tone values, as the resulting slide might otherwise be ludi-

cious in its effect. This process of developing a slide is necessarily very slow, forcing being at no stage admissible, as it would insure certain failure.

The Use of Formalin.—In winter the gelatine is sufficiently tough to withstand this seemingly rough treatment, but in summer it is well to soak the slide before the brush reduction is begun in a very weak solution of formalin for about a minute and then rinse thoroughly. The solution used by me is one thousand parts of water to one part of formalin. Sometimes the resulting color of the slide produced in the above described manner is objectionable and possibly rather uneven. To overcome this defect, the slide must be toned in a suitable bath. Among the many experiments made by me, the following will interest you most:

Toning.—In many cases it is desirable to color a slide to a pure blue, or perhaps only a suspicion of blue. An absolutely reliable method to obtain this color is to use the following bath:

Blue.

I. Sulphocyanide of ammonium.....	200 gr.
Water.....	32 oz.
Carbonate of soda (granular).....	2 gr.
II. Chloride of gold (brown).....	15 gr.
Water.....	1 oz.

For use take 2 ounces of I and 4 drops of II, always remembering to add II to I, and never reversing the operation. This amount of solution will tone at least one slide to a perfect blue. The toning bath, in order to work satisfactorily, ought to have a temperature of 72° to 76° Fah. Using the bath at a lower temperature results in failure, as the toning proceeds too slowly and unsatisfactorily in other respects. A higher temperature will hasten toning, but the gelatine of the plate is apt to be attacked in a most disagreeable way.

To judge the process of toning, it is necessary to examine the slide by transmitted light, using daylight if possible. A thoroughly toned slide will have a pure blue color when examined in that way. According to my experience, it is advisable to tone reduced slides after they have been dried, especially in such cases in which only partial toning is to be used. As for the density of toned slides, let me say that those toned with the above bath do not increase in density perceptibly.

Green.

In order to obtain a green slide, the following treatment is best:

I. Oxalate of iron.....	20 gr.
Ferricyanide of potassium.....	15 gr.
Water.....	32 oz.
II. Chromate of potassium.....	5 gr.
Water.....	16 oz.

Bathe your slide, which in this case must be somewhat lighter than the desired result, in solution I. In this bath the color will turn to a dark blue. From this it is placed in solution II for a minute and then dried. When dry the slide will be a bright green.

Bartolozzi Red.

Bartolozzi red is obtained by using the following bath:

I. Ferrocyanide of potassium (yellow prussiate).....	15 gr.
Water.....	16 oz.
II. Nitrate of uranium.....	30 gr.
Sulphocyanide of ammonium.....	150 gr.
Citric acid (crystals).....	30 gr.
Water.....	16 oz.

For use, take 1 part of I and 1 part of II, and place your slide, which must be first thoroughly soaked, in this solution. It will quickly assume a beautiful Bartolozzi red color. In many cases the whites are stained in coloring the slides in this way, and in order to remove the same, dip them into

Carbonate of soda.....	15 gr.
Water.....	32 oz.

for a moment, not longer, and the stain will disappear. After this operation proceed to wash.

Partial Toning.—In using the gold toning bath some beautiful effects of color may be obtained by so-called partial toning. These colors are obtained by dipping the slides into the toning solution for a short time and then examining them by transmitted light. The combinations of the original ground color of the slide and the partial deposit of the gold, which is blue, give us quite a range of purples, blues, reds, grays, blue-blacks, etc., the color depending upon the ground color and the length of toning. Many of the snow scenes before mentioned were treated in this way.

Local Toning with Different Baths.—While experimenting with the above mentioned and many other coloring processes, it struck me to try and color slides by using these baths on one and the same slide locally. In order to succeed, quite a little skill in handling the brush and the various solutions, as well as the water faucet, are essential. And even at that, most slides are apt to be spoiled by the colors running into each other. My mode of procedure is as follows: I take a dry slide, dip into water so as to simply moisten the surface of the gelatine, and then apply the gold toning solution with a small or large brush, as the occasion may require, to those portions of the slide which are to be colored to blue, and shades of the same, and also the blue-blacks and purples, all of which are obtained by

the sulphocyanide bath. After these portions of the slide have been colored satisfactorily, an operation which is most trying to one's patience and nerves at times, the other portions are treated successively with the various remaining baths. In most cases the results are exaggerations and also crude; nevertheless such a slide, especially from a chemical point of view, is of great interest. In certain instances, however, such local coloring or toning is of great effect and beauty, especially if the original ground color of the slide be kept and another color simply suggested in parts. Some of the Venetian scenes in which water, sky and a few houses and gondolas make up the picture, treated in this manner, show up beautifully.

As a general rule, the monochrome slide is preferable to those colored by any means whatever, especially for pictorial purposes. Nevertheless, an occasional suggestion of color, if used very discriminately and with understanding, relieves the monotony of an evening's entertainment of slides, always remembering that by colored slides I refer to photographically colored ones, and not those tinted by hand with aniline dyes. Those can hardly be included within the limits of legitimate photography.

English Sales of Rare Books.

In the Athenæum, under the title "The Book Sales for 1896," an endeavor is made by Mr. J. H. Slater to find out how much a library brings when put up at auction, and how much for each book. By a book is meant a work of merit, distinguishable for its excellence, rarity or binding, or because it happens to be a first edition. Only first class collections are considered.

From the Book Prices Current the following has been made up as to the year, the number of books, the total amount paid for all of the books, and the average per volume:

	Lots of Books.	Realized.	Average.
1893.....	49,671	£66,470	£1 6s. 7d.
1894.....	51,108	72,472	1 8s. 5d.
1895.....	45,431	71,229	1 11s. 4d.
1896.....	47,268	80,111	1 13s. 10d.

It is noticeable that, with fewer books sold in 1896 than in 1894, the average for the last year was larger by over 5s. The particularly valuable libraries that were put up at auction may account for this, and with the sale of the Ashburnham collection this year it may be that the average reached will be still higher, because that library contains so many prized volumes.

At the William Stuart sale, in England, of March, 1895, 215 books brought £4,297, or about £20 per volume. The Syson Park library brought £14 per volume and the Beckford collection £8 per volume. In the Stuart library the high price is accounted for by the sale of four manuscripts, which brought £1,700, and six printed volumes, for which £1,000 was paid. In 1895 the rate of price might have been less than £1 11s. 4d. per lot, except for the fact that some first editions of Chaucer, and imperfect ones at that, brought £2,900.

Fashion in regard to first editions seems to have somewhat passed away in England; that is, so far as it relates to modern writers. First editions of Dickens, Thackeray, Lever, and Jeffreys were not worth as much in 1896 as they were in 1895, and Mr. Slater intimates that if they can be had at reasonable prices to-day, these first editions are good purchases. They will never be plentiful.

Mr. Slater tells of some rare books sold last year, and among them Eliot's Indian Bible. As all book collectors know, a great thing is to get a copy of this Indian Bible with its dedication. When Lord Chancellor Hardwicke's library was sold, in 1888, a perfect Indian Bible, with the dedication, and in a contemporary binding, brought £580. For a copy without the dedication £82 was given this year.

D. W. C. Hoover, Inventor of Photographic Devices.

We are informed of the death of D. W. C. Hoover, at Cayuga Island, near Buffalo, New York, especially well known among photographers and the photographic trade for his ability as a skillful demonstrator in photographic manipulation and noted for his several inventions and improvements in photographic apparatus, among which may be mentioned the Hoover shutter and a machine for rapidly exposing prints on bromide paper, besides special machinery for coating and preparing such paper and films.

At the time of his death he was engaged in perfecting a special film for use in ribbon photography. His formula for a pyro and potash developer known as the "Hoover developer" gained for him quite a reputation among photographers; he also invented special devices for the saving of gold and silver from photographic wastes. His inventive talents were not confined wholly to photography, as in the last year or two he designed a steam yacht of a special model named the Vixen, and had the machinery constructed after his own ideas, with a view to securing greater speed. His practical way of conducting photographic operations and his readiness to aid photographers striving to learn new processes were his noteworthy characteristics.