

THE PARADISE BIRDS RECENTLY DISCOVERED IN NEW GUINEA.

Of all the families that constitute the order of the Passerines, that of the Paradisidæ is assuredly the one that has already furnished ornithologists with the largest number of extraordinary forms and the one that has still in reserve for them the most astonishing surprises.

In his book entitled "The Wonderful Birds," Lissou, in 1835, mentioned but fourteen species of birds of paradise, of which he had been able to study specimens in the collections of the Museum, and living individuals of which he had observed in their native country during a sojourn of several weeks on the south coast of New Guinea. At present, on the contrary, we reckon no less than eighty-two species of birds of paradise, which, for the most part, are represented in the galleries of the Jardin des Plantes. Some of these species, it is true, merely reproduce, with slight modifications, the types of species known of old, but others differ in toto from the classic forms, and, by the singularity of their plumage, exceed anything that the imagination could conceive of.

Who would have supposed that there existed such a bird of paradise as the *Paradisornis Rudolphi*, in which the ornaments, that is to say, the large tufts of feathers that deck the sides, exhibit a magnificent ultramarine color instead of the yellow or red of the ordinary birds of paradise? Who would have expected the discovery, in the north of New Guinea, of the extraordinary *Pteridophora Alberti* that Dr. A. B. Meyer, of Dresden, was the first to make known, and of which a detailed description was published a few weeks later by the writer, in the Bulletin of the Museum? This paradise bird differs from all those that have been known up to the present by being provided with odd ornaments consisting of two long appendages inserted on each side of the head, back of the eyes, and carrying a series of horny plates, of a shining bluish white upon their upper surface and of a uniform brown beneath.

Upon each appendage, which is at least double the length of the bird, there are forty of these plates, which are quadrangular and which increase in size to a certain point, and then gradually diminish in the last third of the appendages.

These latter and the plates have been aptly compared to the fronds of certain ferns by Dr. Meyer, who has for this reason given the bird the generic name of *Pteridophora*; but they also re-

semble those flag-carrying ropes that deck pleasure craft in nautical fetes. In reality, they are feathers of the category of those that have been called enameled feathers by Dr. Fatio and that are met with also in the king fishers, in certain tanagers and in the irenas, Asiatic sparrows of blue and black livery nearly akin to the orioles. These feathers are generally, or rather appear to be, blue or green, for, in reality, they have not those brilliant colors, which they owe solely to the play of light upon a layer of enamel formed in each vane of large, nearly superficial cells.

Seen by transparency, they are simply horn colored. This is what we observe also in the large head feathers of the *Pteridophora*, the plates of which, naturally brown, shine with a nacreous luster.

It was already known, of the siflets, for example,

that certain birds of paradise might have the sides of the head ornamented with long, profoundly modified feathers, the shaft being deprived of vanes, save in its terminal portion, so as to resemble loose sprays terminating in a small flat appendage; but the vanes had never been seen, as in the *Pteridophora Alberti*, wanting on one side of the feather and completely soldered on the other side, save at certain points regularly spaced, so as to constitute a series of horny plates. These plates, however, are only an exaggeration of the expansions that are observed at the extremity of certain feathers of a wading bird of Madagascar, the cock of Sonnerat, and a sort of cuckoo of the Philippines; or, again, at the extremity of some of the wing feathers of the Bohemian chatterer, in which they have the aspect of drops of sealing wax.

Deprived of its plumes, the *Pteridophora Alberti*

them into a nearly horizontal plane or pointing them forward when the bird struts, of letting them gently fall when it is at rest, or of permitting them to float in the wind like streamers when the bird flies from tree to tree, as shown in our engraving.

Like many of its congeners, the *Pteridophora* is a mountain species. Of its habits we unfortunately know nothing. All that we can suppose, from the presence of fragile feathers, more than twice as long as the body, upon the head of the male, is that the *Pteridophora* does not seek its food upon the ground, that on the contrary it passes a great part of its existence upon trees, and that it perches upon the branches near the summit rather than amid the foliage, imitating in this the habits of many other paradise birds.

Along with the *Pteridophora*, the Museum has obtained from Mr. Van Renesse van Duivenbode two

other birds of paradise, one of which is a male of the *Amblyornis ornata* or gardener bird, while the other is a male, in mating plumage, of the species that has just been described by Mr. A. B. Meyer under the name of *Parotia Carolæ*. The *Parotia* are the paradise birds commonly called siflets. The oldest known species of this genus is the *P. sexpennis*, the "coran-na" of the Papuans who live upon the Arfak Mountains to the northwest of Geelwinck Bay, amid the woods at a mean altitude of 4,000 feet above the level of the sea. The males are clad in a superb mantle of black velvet with purple reflections. Upon the throat they have a metallic plastron of incomparable luster, upon the head a diadem of white feathers, and upon the nape of the neck a disk that is at least as brilliant as the gorget. The females have none of these markings, but on the contrary have brown, black and gray plumage, with transverse bars upon the chest.

In 1885, Mr. Ramsay made known a second species of *Parotia* (*P. Lawesi*), which came from the Astrolabe Mountains, situated not far from Port Moresby in the south of New Guinea. This species is distinguished from the *P. sexpennis* or common siflet by several characters. The males, in fact, have the caudal feathers notably shorter, the mantle black without purple reflections, the diadem white, tinged with red behind, and the neck of a steel blue with violet reflections, and not of a golden green with blue reflections, as in the *Parotia sexpennis*. On the other hand, the females have the lower parts of the body of a more or less bright russet with black stripes. The *Parotia Lawesi* was found again later on (1889) by Mr. A. P. Goodwin, an English nat-

uralist who had joined the expedition directed by Sir William MacGregor, governor of the British possessions of New Guinea and the object of which was the ascension of Mount Owen Stanley.

After having ascertained the presence of this species of paradise bird upon the sides of Mount Belford, at an altitude of 13,000 feet, Mr. Goodwin succeeded in capturing several individuals upon another mountain of the same region at a corresponding altitude. He was even enabled to study the habits of this bird at close range, since the encampment of the expedition was in the immediate vicinity of one of the places where the birds come to play their gambols. These paradise birds, in fact, are accustomed to assemble to the number of six or eight at certain epochs at a point of the forest where the ground is free from brush and herbage, and to engage in a sort of play, or



BIRDS OF PARADISE OF NEW GUINEA.

Pteridophora Alberti (flying) and *Parotia Carolæ* (perching). Both half natural size.

would offer nothing remarkable. It would be a vulgar sparrow of the size of a blackbird clad in a brown and black livery, set off with a little golden yellow upon the wings and the lower part of the body, and recalling the livery of the other paradise birds only by the velvety aspect of the head and neck feathers. Moreover, the females of the *Pteridophora Alberti* must exhibit this modest physiognomy, doubtless quite similar to that of the siflets, and it is likewise thus that the males present themselves, except at the season of courting. The long plumes that they carry so proudly are temporary ornaments that fall at a given moment and free the bird of an inconvenience that must be quite sensible by reason of the exaggerated length of these appendages. These latter, it is true, must be slightly movable. At their base are inserted cutaneous muscles that are capable of spreading them apart, bringing

perhaps passages of arms, in which the males display the splendor of their adjustments to the eyes of the females.

Such, probably, are also the habits of the Parotia Carolæ, which, upon the Yaour Mountains, to the southeast of Geelwinck Bay, replaces the Parotia sexpennis, of the Arfak Mountains, and the P. Lawesi, of New Guinea. The Parotia Carolæ, represented in the foreground of our engraving, is of a little more massive form and of larger dimensions than the P. Alberti, the size of its body, moreover, being exaggerated by the amplitude of its velvet mantle. Upon its breast there is a wide plastron formed of scaly feathers, regularly imbricated and having a metallic luster. However, the reflections of these scales are not the same as in the Parotia sexpennis. Instead of gold and green, it is ultramarine and lilac that here prevail and produce a still more agreeable effect to the eye. The nuchal plate is not so large as in the common siflet and the feathers of the forehead present another arrangement. They rise on each side, in a double crest, fringed with silver white and slightly inflected within at its upper edge. These crests, which slightly recall the cephalic disks of the male of the Astropia nigra, form, in uniting in front, a sort of half open bivalve shell, that allows us to see a reddish-brown, silky plate that represents the little silvery cap of the common siflet. This plate extends much further behind than in the P. sexpennis. As an offset, the fillets that detach themselves from the side of the head are a little shorter and terminate in slightly less developed appendages.

We shall not dwell upon the Amblyornis inornata, for we hope to have an opportunity of speaking in more detail of the very curious habits of the gardener birds of New Guinea and Australia. The three specimens with which the Museum has just been enriched are natives of the same locality as those very recently described by Dr. Meyer. . . . At this moment there is an extraordinary emulation among museums and naturalists for the acquisition and description of every new bird of paradise whose skin is brought to Europe, and such emulation is of a nature to stimulate the zeal of explorers.—E. Oustalet, in La Nature.

Effect of Low Temperatures on Permanent Magnets.

Mr. Pictet has described in Comptes Rendus the long series of experiments conducted by him on the influence of low temperatures on the attractive power of permanent magnets. The results obtained are briefly summarized as follows: The magnet experimented upon was made up of three horseshoe magnets and weighed 498.5 grammes. It was magnetized and made to carry its armature for two years, when it was found capable of lifting 4.275 grammes. After this it was left without its armature for 11 years, and its lifting capacity dropped to 3.226.5 grammes.

For the low temperature experiments the magnet was immersed in a bath of alcohol capable of being maintained at any desired degree, and the attraction between magnet and armature was measured by means of a balance. The tests began at +30 and ended at -105 Centigrade, and showed that the force of attraction increases more and more as the temperature decreases. The results of four series of observations gave:

Temperature of magnet, Degrees.	Force of attraction.
+30	57.31
+20	58.48
+10	59.81
0	61.04
-10	62.42
-20	63.93
-30	65.35
-40	66.70
-50	68.15
-60	69.71
-70	71.18
-80	72.18
-90	73.64
-105	76.64

Another Stride in Electrical Invention.

A lamp that will burn for six hundred hours is the invention of George L. Roberts, an electrician, who sold to a tobacco company, for \$80,000, the advertising rights of some of his electrical devices. The lamp of which Mr. Roberts is the inventor is charged with sand, into which two wires are run, which connect with one of the regulation bulbs used on all electric chandeliers. The battery is therefore the sand, but the method of charging it remains a secret with Mr. Roberts. Mr. Edison, after seeing Mr. Roberts' lamp, remarked that he thought he knew all there was to know about electricity, but Mr. Roberts had made a discovery which puzzled him greatly. Mr. Roberts presented Mr. Edison with some of this remarkable sand, but with no fear of having his secret discovered, for analysis happens in this case to kill all traces of the secret discovery. The cost of recharging each lamp is seventeen cents. A friend of mine who has a contract with Mr. Roberts, having bought from him the rights of one of his inventions, tells me he would not have believed the tale of the lamp, had he not seen Mr. Roberts throw a handful of sand into an ordinary

tumbler, inserting two wires into the sand, and connecting the wires with an ordinary electric burner, which burned brilliantly.

Mr. Roberts made his discovery in Minneapolis, in a purely accidental way. He was experimenting with acids in his laboratory and on the table was some sand, over which two wires had fallen and crossed themselves. By an accident a bottle containing a certain acid was overturned and some of the acid ran into the sand at the point where the wires crossed. The result was a series of electric sparks. At present Mr. Roberts is quite a sick man and is in Michigan for his health. Another of his inventions is to make seventy-two changes of color, in the hair, dress, tights, shoes and so forth, of a dancer while she is in motion. The mechanism works by clockwork and the light gleams through the fabrics from a direct current. Mr. Roberts married a daughter of Pillsbury, the great Minneapolis miller.—The Telegram.

(FROM WILSON'S PHOTOGRAPHIC MAGAZINE.)

Photographic Notes.

The So-called Enamel Photo Engraving Process is now much practiced in France. A printer at Rouen preferring the Talbot-Kline process modified by the use of the screen. He takes a print on carbon paper made from a lined negative, develops it on a copper plate, which, when dry, is afterward immersed for a few minutes in a solution of perchloride of iron at 40°; then for a few minutes in the same solution at 38°. The results obtained are very satisfactory.

The Theory of the Lined Screen was explained at the Academy of Sciences by M. Ch. Féry. This professor does not think that the effect obtained by the distance of the screen from the sensitive surface is due to diffraction. He explains it by what is called in physics the theory of the geometric shadow, pointing out that the phenomenon of irradiation should be taken into account in defining the result obtained.

He proposes the following formula: $e = \frac{af}{3D}$, in which e

is the distance of the screen from the sensitive surface, a the width of one of the opaque lines of the screen, f the focal length of the objective, D the diameter of the useful opening of the diaphragm.

For an objective furnished with a normal diaphragm $\frac{b}{10}$ we have sensibly $e = 3a$, which gives $e = 0$ mm. 3 for a screen having fifty lines to the centimeter.

From experiments that we have made this figure is too small even for negatives that are very soft. It is true that M. Ch. Féry adds: "The want of true surface in the photographic plates does not enable us to easily obtain the parallelism of the lines and of the sensitive surface." It would be preferable to slightly

increase the ratio $\frac{b}{D}$ by a smaller diaphragm, so as to obtain e larger.

We believe that the phenomena of diffraction should be taken into account, as it is by it that it is possible to explain the curious effect of the eating away of the angles of the squares which converts a square point, when the screen is placed in contact with the sensitive surface, into an almost round point when the screen is placed at a distance.

Albumenized Paper is at the present time neglected, wrongfully so, in our opinion, by amateurs. We have the proof of this in the International Exposition of the Photographic Art organized by the Paris Photographic Club. For 520 of the 620 prints exhibited the printing process used for obtaining the image was given, and we give the following results which characterize the tendency of amateurs:

Prints on platinum paper.....	169
" gelatine bromide paper.....	120
" carbon paper.....	81
" aristotype paper (7 collodio-chloride).....	33
" carbon velvet paper.....	34
" salted paper.....	34
" bichromatized gum paper.....	26
" albumenized paper.....	9
" different matt paper.....	5
Prints in helio-engraving.....	5
Prints on divers papers.....	4

At this exposition were found exhibitors from all countries (England, America, Germany, Italy, Russia, and France), and everywhere we see the tendency to use platinum, bromide, and carbon, that is to say, that which gives durable impressions.

The now general employment of small instruments and the ease afforded for procuring enlargements have been the cause of the utilization of gelatino-bromide paper. As regards platinum paper, the facility and the rapidity of the development have made its use general, as it gives with weak impressions most beautiful portraits in the hands of our Parisian artists—Nadar, Hoyer, Reutlinger & Son, Otto, etc.

The Eastman Company has placed on sale a small apparatus of relative cheapness—the flat folding kodak. When it is shut it has the appearance of a lady's small satchel and contains the necessary supply for making forty-eight negatives. The rolls of pellicle

are placed laterally, so that the apparatus is very flat.

Etoile.—Messrs. Poulenc Brothers have just placed on sale a synthesis pyrocatechin, bearing the mark Etoile. This is a perfectly pure product, as is everything that this house sells bearing its stamp. Here are the formulas recommended:

Solution A.	
Sulphite of soda.....	30 grammes.
Pyrocatechin.....	10 "
Water.....	500 "

Solution B.	
Carbonate of potash, pure.....	100 grammes.
Water.....	500 "

1. For plates of short or medium instantaneous exposures in a bright light, take 1 part of A, 1 part of B, 1 part of water.

2. For quick, instantaneous plates, or those obtained in a defective light, take 1 part of A and 1 part of B.

Stereo-jumelle.—Colonel Mossard has constructed a small apparatus which he calls stereo-jumelle, and which has for its object to give the stereoscopic impression of the subject. For this he places the two prints one above the other, instead of placing them at the same height; to examine them and to obtain the impression of relief it is necessary to place before the eyes a little appliance formed of two very short tubes, presenting the appearance of a very short opera glass; this is the stereo-jumelle. In each tube is placed a small prism, which by refraction causes the two prints to coincide and makes the image appear in relief. This same instrument may serve, if furnished with magnifying lenses or other appliances for enlargement, for the examination of ordinary stereoscopic prints.

Artificial Caoutchouc, more or less resistant, made by dissolving four parts of nitro-cellulose with seven parts of bromo-nitro-toluol. By changing the quantity of nitro-cellulose it is possible to obtain a substance having elastic properties and greatly resembling caoutchouc and even gutta percha. It is also possible, according to the Revue de Chimie Industrielle, to substitute for the bromo-nitro-toluol the nitro-cumol and homologues.

The Boring of Glass by using essence of turpentine as a lubricant for the point of the drill. This method is helped by adding a little camphor to the essence used. It is also proposed for the same purpose to use acetic acid as a lubricant, in which a small quantity of alum has been dissolved. As it may be necessary to use this method for certain appliances, we think it well to point it out.

Pictures in Colors.—M. Auguste Lumière has pointed out a modification of the process proposed by Messrs. Cros and Ducos du Hauron for obtaining colors by the superposition of three monochromes. In the preceding methods three carbon prints were superposed, but the difficulties offered by the adjustment were very great. In the proposed method three coatings of bichromatized gelatine are used, each coating being separated by a coating of collodion, which serves as an isolator. After the spreading of each coating of bichromatized gelatine it is exposed (when dry, and before spreading the coating of collodion) under one of the three monochrome negatives obtained according to the method indicated by M. Ducos du Hauron. The bichromate is afterward eliminated by washing and the plate is immersed in the dyeing bath, where by imbibition, according to the process of M. Cros, the colored monochrome is obtained. After drying another coating of collodion is applied, and the operation is again proceeded with as in the first case, by using a second dye appropriate to the second negative used. The third coating is finally spread as the preceding one and so on, the superposition of the three monochromes giving the colors of the original.

The Process for Obtaining Countertypes with the aid of solutions of bichromates has demonstrated that this substance does not destroy the latent image, as different authors have stated. M. Léon Vidal has endeavored to find if certain modifications in the mode of operating were not the cause of this error. He found that the bichromates act as retarders, and that by using these solutions it is possible to obtain negatives that are more pure and free from the gray fog than is seen when the sensitized plates have been exposed to the light for a very short time, or when the spontaneous reduction that is frequently observed in very rapid plates has taken place. By immersing the sensitive plates in the bichromate at 1 per cent, after exposure to light, the latent image is not destroyed, but a greater degree of latitude may be obtained in the duration of the development, and, consequently, a greater degree of certainty will be obtained for giving to the negative the requisite density without fear of fogging.

AFTER the storm of July 13 one hailstone was found in a garden on Van Dien Avenue, Ridgewood, N. J., measuring full four inches in diameter, two inches thick at the center; the form being saucer shaped, rounded on one side, the other side flat. Of the many large hail stones that fell, this one was distinct, from its size and perfection in saucer form. Its weight was not ascertained.