days only. The following orbit by Mr. Hind is founded on positions between February 8 and March 11 :—

Perihelion Passage, 1877, January 19·18369, G.M.T.

Longitude of Perihelion	200 4 18·0	M. Eq.
,, Ascending Node ...	187 15 7·0	1877·0
Inclination to Ecliptic...	27 5 24·1	
Log. Perihelion Distance	9·9071303	

Motion—retrograde.

There seems to be no sensible deviation from the parabola.

BIOLOGICAL NOTES

NEW WORK ON BIRDS.—We have received the prospectus of a new work by Dr. A. B. Mayer, Director of the Royal Zoological Museum of Dresden, to be entitled "Abbildungen von Vogel-Skeletten," in which he signifies his intention to publish, in parts, figures of the skeletons of rare or little-known birds. Each part is to contain ten plates of large quarto size, one of which, representing the skeleton of the extremely uncommon parrot from New Guinea, *Dasyptilus pecqueti* (Lesson) accompanies the prospectus. It is a photo-lithograph, and differs materially from any other which we have seen in one important particular, namely that the bones of one side only are depicted, which is a great advantage, as it prevents the confusion unavoidably associated with the representation of the whole structure. The illumination of each bone and the focus of every part is most satisfactory, more so in many respects than any drawing could possibly be. Short commentaries, with measurements, will accompany each plate. It is proposed that Part I. shall contain figures of *Loriculus cuiacissi*, *Charmosyna josephinæ*, *Meropogon forsteni*, *Paradisea papuana*, *Cicinnurus regius*, *Manucodia chalybea*, *Ptilopus speciosus*, *Otidiphaps nobilis*, and *Gallus bachiva* (from Celebes). In the series is also to be included the skeletons of the several domestic pigeons and fowls. We hope that Dr. Mayer will have a large subscription to this valuable addition to ornithological literature.

THE BODY-CAVITY IN THE HEAD OF VERTEBRATES.—It has hitherto been regarded as a point of distinction between the mouth, throat, and gill region of vertebrates, and the rest of the trunk, that in the former no splitting of the body wall took place in early development, while in the trunk the body-wall becomes sharply separated from the contained viscera, and a cavity arises between them, part of which is the peritoneal cavity. Mr. Balfour (*Jour. Anat.*, April, 1877) has announced the discovery in sharks of a head-cavity on either side of the throat, dividing the growing tissue into an inner and an outer wall. When the visceral clefts (future gill-slits, &c.) appear, they subdivide these cavities into smaller ones. The head-cavity even grows forwards as far as the eye, and ultimately there is a series of cavities : (1) a premandibular, (2) a mandibular, (3) a hyoid, (4) a series in the branchial arches. These cavities ultimately atrophy, but their walls become developed into muscles, and they answer to the muscle-plates of the rest of the body. Thus this discovery gives information of a most valuable kind as to the segmental relations of the head to the rest of the body, besides furnishing a glimpse of a primordial condition in vertebrates which had till now remained unknown.

FISH-EATING BIRDS.—Mr. Joseph Willcox has recorded an interesting observation on the crow blackbirds of Florida (*Quiscalus purpureus*). Standing on the bank of a river in Florida, he noticed a commotion among a congregation of crow blackbirds, which were anxiously looking into the water. A large bass was pursuing its favourite food, the small fry, and the latter, in their frantic efforts to escape, jumped out of the water, and many of them fell on the land. The blackbirds, evidently experts at the game, immediately pounced upon the small fish, and swallowed them before they could get back into the water. (*Proc.* Acad. Nat. Sci., Philadelphia. 1877.)

ANTS' DOMESTIC ANIMALS.—Prof. Leidy (Philadelphia) has observed colonies of *F. flava* in possession of several kinds of insects at once. A comparatively small assemblage of them had three groups, an aphis, a coccus, and the larva of an insect, apparently coleopterous. The aphides were kept in two separate herds, and these were separated from a herd of cocci. In a larger colony of ants there was a collection of aphides occupying the under part of one margin of a stone, for ten inches long by three-quarters of an inch wide. A distinct group of cocci, closely crowded, filled a square inch. They all appeared to be carefully attended to by the ants.

A WHALE IN THE MEDITERRANEAN.—M. P. J. Van Beneden has made a short communication to the Académie Royale de Belgique, published in that Society's *Bulletin*, with reference to a letter by M. Capellini, on a true whale captured in the Mediterranean Sea, near Taranto. The Italian author suggests the new specific name *Balæna tarantina*, but M. Van Beneden much more reasonably thinks it most probable that it is a stray specimen of *B. biscayensis*.

THE LATE MR. GASSIOT

WE last week announced briefly the death of Dr. J P. Gassiot, and now give some account of the principal scientific results obtained by him. Mr. Gassiot, partner in the firm of Martinez Gassiot and Co., wine merchants, Mark Lane, first devoted his spare time to electrical experiments about the year 1838. An Electrical Society was formed about that time in which he took an active part. At one of the meetings it was observed that when the two copper wires forming the poles of a powerful voltaic battery were crossed and drawn asunder so that the voltaic arc passed between them, the positive terminal became heated to incandescence, while the negative remained comparatively cool. This excited great interest in Mr. Gassiot's mind and led him to make several experiments, but without thoroughly explaining the phenomenon. In the course of these experiments he procured powerful batteries, first of Daniell's construction, then of Grove's, and ultimately a large water battery.

It had been observed by many writers (principally Continental) that while the dynamic and chemical effects of the voltaic battery increased in intensity in proportion to the increasing chemical action in the cells of the battery, the static effects, such as the repulsive action in a gold leaf or pith ball electroscope, the spark, the power of charging a Leyden phial, &c., were more intense when the battery was charged with water and had consequently but a feeble chemical action in the cells. This anomaly puzzled electricians much, and though sought to be explained by various hypotheses, was a great stumbling-block in the way of the chemical theory of the voltaic battery.

Mr. Gassiot had been led to attach great value to good insulation between the cells of the battery, and he procured to be made a Grove battery (the most powerful chemical battery known) of 100 glass cells, all having long glass stems, and separated from each other. This battery gave very powerful chemical results, and a voltaic arc of great brilliancy ; but, what was of the greatest importance, he found that with this battery the static effects, or effects of tension, were greater than those of an equally-sized water battery. The puzzling anomaly was thus explained : the reason why the chemical battery had seemed inferior in tension to the water battery was that from the effervescing liquids, the close approximation of

the cells, and their being moistened with good conducting liquids, insulation was destroyed, and no static effects at the terminal, or very feeble ones, were perceptible. This result, by far the most important of Mr. Gassiot's labours, was published in the *Phil. Trans.* of the Royal Society for 1844, p. 39. It got rid of the strongest objection to the chemical theory of the pile, and brought into harmony results which up to that time had appeared discordant.

In 1852 Mr. Grove had published in the *Phil. Trans.* of the Royal Society, in a paper "On the Electro-Chemical Polarity of Gases," an account of transverse dark bands or striæ, which he was the first to observe in the electric discharge. The discharges were obtained from a Ruhmkorf coil, and made to pass through attenuated gases, or what were commonly called *vacua*. Mr. Gassiot made a vast number of experiments on these striæ, the most important of which was that he obtained them in a Torricellian vacuum with the voltaic arc, showing that they did not depend on the intermittence of the discharge (occasioned by the contact-breaker), but accompanied all electric discharges *in vacuo*. There is, perhaps, some doubt whether the voltaic arc is absolutely continuous, or whether it does not produce, by its action on attenuated gas, something like waves (a stone thrown into water may be a rough simile), but at all events it is continuous in its inception, and in that respect quite different from the interrupted discharges of the contact-breaker apparatus, or the common electrical machine.

Mr. Gassiot devoted himself for a long time to procuring *vacua* as perfect as they could be obtained, for the examination of the electric or voltaic discharges, and proved distinctly that when the attenuation was pushed to a high degree of rarity, the electric discharge would not pass at all, a result which had been observed by Morgan (*Phil. Trans.*, vol. lxxv.), the accuracy of whose experiments was impugned by Davy.

Mr. Grove, as an answer to the contact theory of the voltaic pile, had shown that if two polished plates, one of zinc, the other of copper, were approximated, but kept from contact by a thin film of paper or mica, and then separated, the electric effects, alleged to be due to the contact of dissimilar metals, were produced; it was objected to this experiment, and not without reason, that these effects might be produced by friction of the paper or mica. Mr. Gassiot effectually got rid of this objection by bringing the plates into close proximity by a delicate micrometer apparatus and then quickly separating them; the same electrical results followed (*Phil. Mag.*, October, 1844).

The above are the principal of many curious results obtained by Mr. Gassiot. While thus giving up his leisure time to science, he was a diligent and successful man of business and a liberal promoter of, and contributor to, all useful scientific and benevolent objects, some of which we mentioned in our previous notice.

THE SPECTRUM OF NOVA CYGNI

IN the *Monatsbericht* of the Royal Academy of Sciences of Berlin (May, 1877), Herr Vogel, the eminent astronomer, publishes the details of his investigations of the spectrum of the new star in Cygnus, and whilst expressing his own views with regard to the physical condition of the star, enters upon a criticism of those of other observers. Herr Vogel observed the spectrum on sixteen different nights; the first observation was made on December 5, when the star was of 4·5 magnitude; the last on March 10, when the magnitude was only 8·3.

Herr Vogel's observations show that the spectrum of the new star was a continuous one, showing numerous dark lines and bands and several bright lines. The intensity of this continuous spectrum, which at first was very brilliant, decreased rapidly, so that three months after the discovery of the star it was only partly visible, and even that part was very faint. The decrease of intensity did not spread evenly over the whole spectrum; the blue and violet rays grew fainter far more rapidly than the green and yellow rays. The red part of the spectrum, which already during the first observations was very dim and crossed by broad absorption bands, soon disappeared altogether, so that a bright line in the red seemed to remain quite isolated. At first a dark band in the green, and, later on, a very broad dark band in the blue, were particularly conspicuous. With the exception of a bright line in the red, the other bright lines at first surpassed the continuous spectrum but very little in brilliancy; they could therefore be seen only with difficulty. During the rather rapid decrease of intensity of the continuous spectrum they, however, became more easily discernible, and, as results from the measurements made, the hydrogen lines Hα and Hβ were particularly bright, and, later on, a line of 499 mill. mm. wave-length. This latter line remained longest when the spectrum faded away, and finally surpassed the hydrogen lines in intensity; the red hydrogen line was the first to grow fainter. The weather not having been very favourable, the measurements which Herr Vogel made have no claim to very great accuracy, but they at least prove that the following *bright* lines have appeared in the spectrum:—

1. The hydrogen lines $\left.\begin{matrix} H\alpha \\ H\beta \end{matrix}\right\}$ beyond doubt.
   Hγ most probably.

2. A line of 499 mill. mm. wave-length ($\pm$ 1 mill. mm.). This line coincides tolerably well with the brightest line in the nitrogen spectrum under ordinary pressure; it is the same line which is brightest in the spectra of nebulæ.

3. An indistinct line of 580 m. mm. wave-length.

4. An indistinct line of 497 m. mm. wave-length. This nearly coincides with a close group of lines in the atmospheric spectrum.

5. Some bright lines were seen in the neighbourhood of *b* and *E*, but their position could not be measured. On December 5 two lines were measured in the blue (of 474 and 470 wave-lengths), and were also observed on December 8, but, later on, only the second one has again been seen as an indistinct band of 467 wave-length.

In the accompanying illustration (Fig. 2) we reproduce Herr Vogel's drawings, which supplement his observations, and, as he points out, contain many a detail which could not well be described in words.

Herr Vogel, in discussing the views of other astronomers, first deals with M. Cornu's observations. M. Cornu made his first observations on December 2 and 5 (see NATURE, vol. xv. p. 158); he succeeded in measuring several bright lines in the spectrum, viz., wave-lengths, 661 (Hα), 588, 531, 517, 500, 483 (Hβ), 451, 435 (Hγ). He saw no dark bands distinctly in the continuous

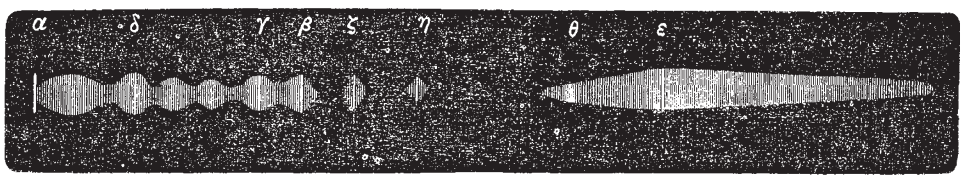

FIG. 1.—Cornu's Spectrum of Nova Cygni.