I may further add, from my own knowledge of the caves in Mauritius I think it very unlikely that any animal remains so recent as those of the Dodo or its contemporaries will be found in them, as in the rainy season they are generally flooded by roaring torrents, which would at once wash away modern deposits.

2. On a new Toucan of the Genus *Pteroglossus*. By P. L. Sclater, M.A., F.R.S., Secretary to the Society.

[Received April 24, 1890.]

A single skin in the British Museum, formerly in the Salvin-Godman Collection, seems to indicate the existence in Upper Amazonia of a new species of Toucan allied to *P. viridis*.

This I propose to call

Pteroglossus didymus, sp. nov.

Supra obscure viridis, alis caudaque nigricantibus viridi limbatis; capite nigro; uropygio coccineo: infra limonaceo-flavus in ventre medio brunnescente adumbratus; gutture et colli lateribus nigris; tibiis brunneis; rostri mandibula superiore flavida, hujus culmine et ipsa apice nigris; inferiore nigra, ad basin margine flavicante ornata: long. tota 14·5, *alæ* 4·6, *caudæ* 5·6, *rostri, a rictu ad apicem linea directa,* 3·3.

Hab. Amazonia superior.

Obs. Proximus *P. viridi,* sed rostri culmine nigri, et tibiis brunneis distinctus.

The typical specimen bears one of Hauxwell's well-known paper labels marked :—" Male, iris red. Skin round the eye indigo-blue, with a red patch behind eyes : 27. 8. 80.—J. H."

The species seems to be the Upper Amazonian representative of *P. viridis,* of which there is a good series in the National Collection from Guiana, Cayenne, and Rio Negro.

3. On the Remains of some large Extinct Birds from the Cavern-deposits of Malta. By R. Lydekker, B.A., F.Z.S., &c.

[Received May 2, 1890.]

(Plates XXXV. & XXXVI.)

The greater number of the remains of Vertebrates obtained from the Pleistocene cavern-deposits of Malta having been described in the publications of this Society, I have thought it well to bring to the notice of the Society evidence of some new species of birds from these deposits.

In the year 1865 Prof. W. K. Parker described in the 'Proceedings' of our Society [1] a number of bird-bones from the Maltese

[1] P. Z. S. 1865, p. 752.

caverns which had been collected by the late Admiral Spratt. These were subsequently figured in vol. vi. pl. xxx. of the 'Transactions'; but what has now become of them I am unable to state. Several of them are, however, almost or quite perfect, and therefore better suited to the exact determination of the affinities of their owners than those I have now to describe.

The greater number of these specimens were regarded as belonging to a species of Swan, for which the name *Cygnus falconeri* was proposed. This species was described as being about one third larger than *C. musicus*, from which it was distinguished by the relatively shorter femur, the shorter tarso-metatarsus, and the much shorter phalangeals.

In recently examining the small series of bird-bones from the Maltese caverns presented to the British Museum by Admiral Spratt, all of which have hitherto been labelled *Cygnus falconeri*, I found that only a few of them, viz. two specimens of the imperfect distal extremity of the tarso-metatarsus and some phalangeals, really belonged to that form. These specimens agree with the types in being decidedly larger than the corresponding bones of *C. musicus*, and the phalangeals confirm the conclusion that the species is widely different from any existing form. Most of the other bones, however, are referable to a Vulture and a Crane, and these I now proceed to describe.

GYPS MELITENSIS, n. sp.

The bones of the Accipitres are so easily recognized and so widely different from those of other birds that there is no difficulty whatever in deciding whether given fossil specimens belong to members of this group. A considerable number of specimens in the series already mentioned indicate the existence in Malta during the Pleistocene period of a Vulture exceeding the existing *Vultur monachus* by about one fifth of its dimensions, and therefore the largest member of the Accipitres yet known, with the exception of the still more gigantic extinct New-Zealand bird described by the late Sir J. von Haast under the name of *Harpagornis*. For this species, which may be sufficiently diagnosed by its large dimensions, I propose the name of *Gyps melitensis*, my reasons for the generic reference being given below.

It will be unnecessary on this occasion to give an account of the distinctive osteological features of the Accipitres, since those who are desirous of making themselves acquainted with this subject will find full details in Professor A. Milne-Edwards's 'Oiseaux Fossiles de la France'; and I accordingly at once proceed to notice the various bones, commencing with the tibio-tarsus as one of the most characteristic parts of the skeleton.

In my drawings (see Plate XXXV. figs. 2, 2*a*) there are given two views of the distal portion of the right tibio-tarsus, an anterior view of the corresponding part of the homologous bone of *Vultur monachus* being given in fig. 3. A comparison of the figures will at once show the complete structural identity of the bones, so that detailed description is unnecessary. The characteristic Accipitrine features of this part of the tibio-tarsus are the fore and aft compression of the shaft, the shallow anterior groove, the wide separation of the two condyles on the anterior surface, the extreme obliquity of the bony bridge over the groove for the extensor tendons, and the absence of any tubercle on the bridge itself[1]. On the posterior aspect of the bone, which has not been figured, the shallowness and great relative width of the trochlear surface are equally characteristic. The rough surface for the articulation of the distal extremity of the long fibula is distinctly seen on the postaxial border of the fossil. The specimen represented in the next figure (Plate XXXV. fig. 1) is the imperfect proximal extremity of a right tibio-tarsus, doubtless forming a part of the same bone as the preceding specimen. The cnemial crest and external surface of this fragment are somewhat imperfect, but the contour of the portion which remains perfect agrees in all respects with that of the smaller tibia of *V. monachus*. The greatest transverse diameter of the fossil tibia is 0,030, the corresponding dimension in that of the existing species being 0,025. The total length of the tibia of *V. monachus* is 0,222; and if the same proportion of breadth to length obtained in the extinct species the total length of its tibia would be 0,266. The fossil tibia may be distinguished from the recent one by the somewhat greater prominence of the bridge (*a*) over the groove for the extensor tendons, and the absence of the lateral perforation (*c*) which communicates with the same groove. The great size of this tibia indicates the probability of its owner having belonged to *Vultur* (or an allied genus) rather than to *Aquila*, this inference being rendered certain by the following specimens.

The tarso-metatarsus of the Accipitres is fully as characteristic as the tibio-tarsus, even when, as in the present instance, we have only the distal trochleæ to work with. Thus these trochleæ approximate more or less closely to the same transverse line, and form a slight but regular curve from side to side. The distal extremity of a left tarso-metatarsus (represented in Plate XXXV. fig. 6) accords so exactly in contour with the smaller bone of *Vultur monachus* (shown in fig. 7 of the same Plate) that their close affinity is manifest at the first glance. Moreover, in the relative length of the trochleæ, and the elevated position of the trochlea for the fourth digit, coupled with the slight lateral expansion of the one for the second digit, the fossil specimen resembles *Vultur* and differs from *Aquila*. The much shorter tarso-metatarsus of *Gypaëtus*, while approximating to *Vultur* in the general form of the trochleæ, resembles *Aquila* in the lateral expansion of the trochlea for the second digit. This specimen is therefore decisive that the fossil form should be referred to *Vultur* or *Gyps*. The transverse diameter of the trochlea for the third digit is 0,012, against 0,010 in *V. monachus*. The Museum also possesses portions

[1] By an unfortunate error it is stated in Nicholson and Lydekker's 'Manual of Palæontology,' 3rd. ed. vol. ii. p. 1239, that the bridge itself, instead of its tubercle, is absent in the Accipitres.

of two other specimens of the tarso-metatarsus, as well as another of the distal extremity of the tibio-tarsus.

Of the femur we have a specimen of the distal extremity (represented in Plate XXXV. figs. 4, 4*a*). This bone belongs to the right side, and it is practically certain that the detached head of a right femur in the Museum (No. 49355) originally formed a portion of the same bone. The detached head agrees with the femur of *Vultur* and *Gyps*, as distinguished from that of *Aquila*, by the large size of the depression for the attachment of the ligamentum teres. It has a diameter of 0,018, against 0,015 in *V. monachus*. The distal extremity agrees in all respects with the corresponding portion of the femur of the existing species (represented in figs. 5, 5 *a* of the Plate cited) even down to the position of the fossa (marked *d*) for the attachment of a muscle or ligament. The transverse diameter of the fossil is 0,044 and that of the recent bone 0,037; the former being, as in the case of the metatarsus, about one fifth larger than the latter. The length of the femur of *V. monachus* being 0,133, the calculated length of that of the fossil species would be 0,159.

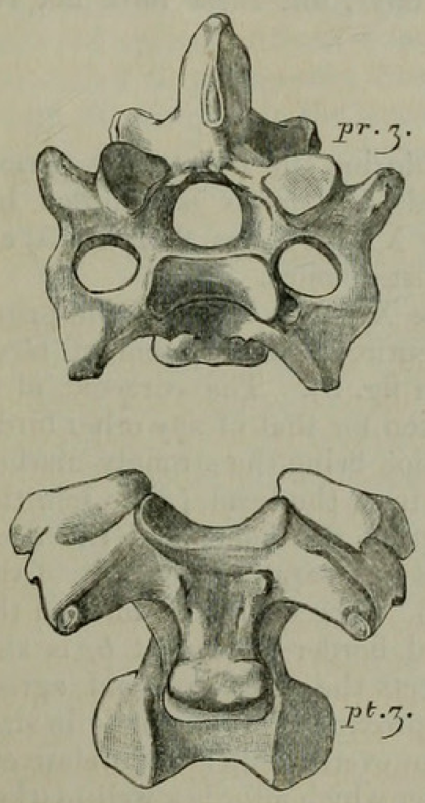
The imperfect proximal phalangeal of the third digit of the pes (represented in Plate XXXV. fig. 8) as well as the imperfect terminal phalangeal (shown in fig. 9 of the same Plate) resemble the corresponding bones of *Vultur monachus*, with the same excess in size as holds good with the other portions of the skeleton.

So far as I am aware there are no very well-marked characters by which the bones of the hind limb of *Vultur* can be generically distinguished from those of *Gyps*. A marked osteological distinction between the two genera is afforded, however, by the cervical vertebræ, more especially those from the hinder part of that region. To exhibit this difference a late cervical vertebra of each genus is figured in the two accompanying drawings (figs. 1, 2, p. 407). It will be seen from these figures that in *Gyps* the lateral borders of the inferior surface of the centrum are much more emarginate than in *Vultur*, while the posterior extremity of this surface is more expanded. The same surface of the centrum is also convex and has a sharp descent to the very deep pit immediately behind the anterior articular surface; whereas in *Vultur* this surface is almost flat, and nearly in the same plane as the lower border of the anterior articular surface. In consequence of this difference a front view of the cervical of *Gyps* shows an abrupt vertical surface some distance behind and below the anterior articular face of the centrum, which is totally wanting in that of *Vultur*. Moreover, the anterior face of the centrum of *Gyps* is relatively larger than in *Vultur*, with much sharper and more oblique lateral borders. Again, in the figured vertebræ of *Gyps* the inferior surface of the centrum has a median pneumatic foramen totally absent in that of *Vultur*; while in the succeeding posterior vertebræ of the former there is a foramen situated below the root of each lower transverse process, which are unrepresented in the corresponding vertebræ of the latter genus.

The above description will at once show that the imperfect late cervical vertebra from the Maltese deposits (represented in Plate XXXVI.

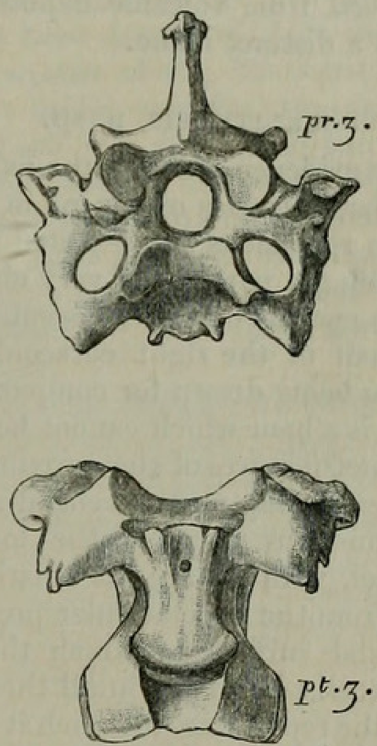
figs. 7, 7 *a*, 7 *b*), which agrees fairly well in relative size with the fossil limb-bones, indicates a Vulture referable to *Gyps* rather than to *Vultur*. The whole of the characters of this vertebra are indeed so essentially the same as those of the existing *G. fulvus*, even down to the presence of the median pneumatic foramen, that it would be waste of words to recapitulate them. Indeed the only distinctive mark of the fossil, in addition to its superior dimensions, is the somewhat greater prominence of the tubercle on the inferior surface of the centrum immediately behind the anterior pit. This slight difference could not, however, be regarded as more than an individual or specific one. The length of the fossil centrum in the median line is 0,029, and the greatest transverse diameter 0,023. The first

Fig. 1.



Anterior and inferior aspects of a late cervical vertebra of *Vultur monachus*.

Fig. 2.



Anterior and inferior aspects of the corresponding vertebra of a small individual of *Gyps fulvus*.

Letters as in Plate XXXVI. fig. 7.

of two later cervicals in the Museum (No. 49354, *a*), apparently coming next behind the preceding specimen, agrees exactly with the corresponding vertebra of *G. fulvus*, having the same pair of pneumatic foramina at the roots of the lower transverse processes. An imperfect anterior cervical (No. 49354*) resembles the seventh cervical of *G. fulvus* in the narrowness of the inferior surface of the centrum, which appears to be the most characteristic feature of the vertebræ of the anterior cervical region.

Taking it for granted that these cervical vertebræ are referable to the same species as the limb-bones described above, they afford conclusive evidence that the large Accipitrine bird of the Maltese caves belonged to the genus *Gyps* and not to *Vultur*.

The specimens described above afford therefore conclusive evidence of the former existence in Malta of a Vulture considerably larger than any existing species, but apparently very closely allied in osteological characters to the large Griffon Vulture of Southern Europe. The existence of such a large raptorial bird in company with the "Pigmy Elephant," of which the height is estimated at three feet, is certainly suggestive that the old fable of the "Roc" carrying off the Elephant may possibly have had a foundation in fact.

I observe that remains of a species of *Gyps* have been recently described from volcanic deposits in Italy[1], but these have not received a distinct name.

GRUS MELITENSIS, n. sp.

The evidence showing the existence during the Pleistocene period of a large species of Crane in the Maltese Islands is afforded by certain specimens (represented in Plate XXXVI, figs. 2, 4 and 5) all of which are portions of very characteristic bones.

The specimen first represented (Plate XXXVI. fig. 4) is the proximal half of the right coracoid, the entire right coracoid of *Grus cinerea* being drawn for comparison (in fig. 3). The coracoid of a Crane is a bone which cannot be mistaken for that of any other bird; the chief features of the proximal portion being the strongly-marked crest extending on the ventral surface from the head (*a*) to join the intermuscular ridge of the lower part of the bone, and the deep channel, with a large pneumatic foramen, separating the body of the bone from the subclavicular process (*c*). The elongated form of the glenoidal surface, of which the lateral border is seen at *b*, is also characteristic. Now in all these respects the fossil coracoid agrees with the recent one, to which it also approximates very closely in size. The head of the fossil coracoid is, however, smaller and relatively narrower than in *G. antigone*, a character which affords a well-marked distinction from that species.

Equally characteristic is the distal extremity of the left tibiotarsus (represented in figs. 5, 5 *a*, 5 *b*, of Plate XXXVI.). This bone in the Cranes (as is shown by that of *G. antigone* drawn in fig. 6) is characterized by the wide anterior intercondylar interval, and by the bony bridge (*a*) over the groove for the extensor tendons being sunk below the level of the lateral borders of the bone and carrying a low tubercle (*b*). A comparison of the figures will show such a close resemblance between the recent and fossil bones as to leave no doubt of the generic identity of their owners. The fossil is, however, readily distinguished by the bridge over the extensor groove being much shorter than in *G. antigone*; a feature in which it resembles

[1] R. Meli, Bull. Soc. Geol. Ital. vol. viii. p. 490 (1890).

G. australiaca[1]. The transverse diameter of the fossil bone is 0,025, against 0,0255 in *G. antigone.*

The imperfect distal extremity of a left tarso-metatarsus (represented in Plate XXXVI. figs. 2, 2 *a*, as being considerably larger than the corresponding bone of *G. antigone,* fig. 1) indicates a Crane larger than the individuals to which the preceding specimens belonged, although not necessarily specifically distinct. It exhibits the relative shortness and backward position of the trochlea for the second digit characteristic of the Cranes. Its greatest transverse diameter is 0,032, compared with 0,026 in *G. antigone.*

Taking the coracoid and tibia alone into consideration these bones indicate the specific distinctness of the Maltese Crane from *G. antigone,* and therefore from the smaller *G. communis*; and its distinction from *G. australiaca* (the coracoid of which I have not had an opportunity of examining) may be regarded as pretty certain. Several species of fossil Cranes have been described. Of these the so-called *G. primigenia,* from the caverns of the Dordogne, agrees with *G. antigone* in the length of the bridge over the extensor groove of the tibia[2], and I believe that both this form and the Italian *G. turfa,* Portis, are indistinguishable from *G. antigone.* The geological horizon of *G. excelsa,* from the Lower Miocene of Allier, in which the tibial bridge is short[3], is alone sufficient to indicate that the present form is in all probability distinct from that species. With *G. pentelici,* of the Lower Pliocene of Greece, the present specimens do not admit of comparison.

Under these circumstances I propose to regard the Maltese Crane as belonging to a new species, for which the name *G. melitensis* may be adopted. It may be defined as agreeing typically in size with *G. antigone,* but distinguished by the smaller and narrower head of the coracoid, and the shorter bridge over the extensor groove of the tibio-tarsus. If the above-mentioned tarso-metatarsus also belonged to it, some individuals of *G. melitensis* will have considerably exceeded the dimensions attained by *G. antigone.*

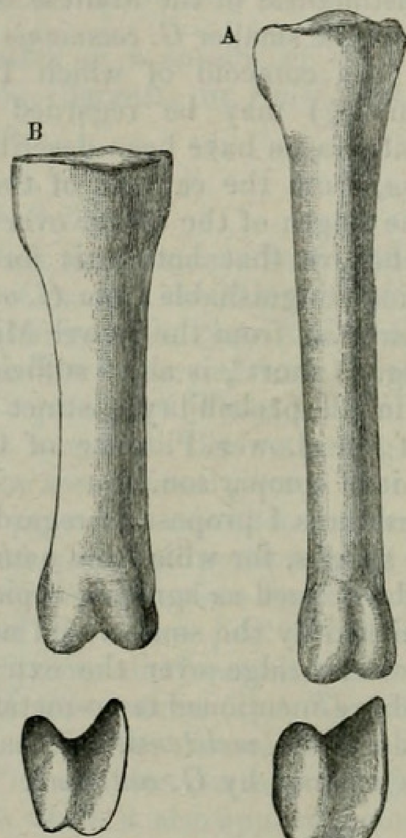
CYGNUS FALCONERI.

The specimens of this species to which I desire to draw attention are the phalangeals to which allusion has been already made, and one of which has been figured by Prof. Parker in the 'Trans. Zool. Soc.' vol. vi. pl. xxx. figs. 20–23. Of these bones the Museum possesses ten examples. In their stoutness and shortness these bones are so utterly different from the phalangeals of existing Swans that it is at first sight difficult to believe that they belonged to a kindred bird. Closer examination shows, however, that the first phalangeals of the third digit (fig. 3, A, p. 410) agree in the form of their proximal articular surface with the corresponding bone of *C. olor* (fig. 3, B, p. 410); while the distal articulation of this bone has the peculiar obliquity and the prominent ridge formed on the posterior

[1] See Milne-Edwards, 'Oiseaux Fossiles de la France,' pl. lxxiii. fig. 5.
[2] See Milne-Edwards, *op. cit.* pl. lxxvi. fig. 8. [3] *Ibid.* pl. lxxv. fig. 5.

aspect by the outer trochlea which are features absolutely characteristic of the family to which the genus *Cygnus* belongs. The figured phalangeal of the extinct species has a length of 0,046, with an antero-posterior diameter of the proximal articular surface of 0,017; the corresponding dimensions in the homologous bone of *C. olor* being 0,060 and 0,014. The lateral phalangeals of the proximal row have similar proportions. Thus in the second digit the proximal phalangeal has a length of 0,037 against 0,048 in *C. olor*; while in the fourth digit the lengths are respectively 0,045 and 0,061.

Fig. 3.



Anterior and distal aspects of the first phalangeal of the third digit of the right pes of *Cygnus falconeri* (A) and *C. olor* (B). $\frac{1}{1}$.

A second phalangeal of the third digit exhibits the peculiar oblique proximal articular surface characteristic of the *Anatidæ*, so that its reference to the present form is undoubted. It has a length of 0,025 against 0,043 in the corresponding bone of *C. olor*.

This remarkable shortness and stoutness of the phalangeals of the pes in *Cygnus falconeri* leaves no doubt as to its distinctness from all other species. The difference is indeed sufficiently great to afford grounds for generic separation; but since the multiplication of generic terms is to be avoided as much as possible I prefer to let the species remain in the genus to which it was referred by its original describer, who remarks that in the shortness of its toes and the length of its legs this species seems to connect the modern Swans with the Geese.

EXPLANATION OF THE PLATES.

(All the figures are drawn of the natural size.)

Plate XXXV.

Fig. 1. Anterior aspect of the proximal portion of the right tibio-tarsus of *Gyps melitensis.*

2, 2 *a.* Anterior and distal aspects of the distal portion of the right tibio-tarsus of *Gyps melitensis.* *a,* extensor bridge.

3. Anterior aspect of the distal portion of the right tibio-tarsus of *Vultur monachus.* *a,* extensor bridge; *c,* lateral foramen.

4, 4 *a.* Anterior and distal aspects of the distal extremity of the right femur of *Gyps melitensis.* *a,* ectocondyle; *b,* entocondyle; *c,* fibular ridge; *d,* fossa for muscular or ligamental attachment.

5, 5 *a.* Anterior and distal aspects of the distal extremity of the right femur of *Vultur monachus.* Letters as in figs. 4, 4 *a.*

6. Distal extremity of the left tarso-metatarsus of *Gyps melitensis.*

7. Distal extremity of the left tarso-metatarsus of *Vultur monachus.*

8. Proximal phalangeal of the third digit of the pes of *Gyps melitensis.*

9. Terminal phalangeal of the pes of *Gyps melitensis.*

Plate XXXVI.

Fig. 1. Distal portion of the left tarso-metatarsus of *Grus antigone.*

2, 2 *a.* Anterior and distal aspects of the distal extremity of the left tarso-metatarsus of *Grus melitensis.*

3. Ventral aspect of the right coracoid of *Grus antigone.* *a,* head; *b,* border of glenoid surface; *c,* subclavicular process.

4. Ventral aspect of the proximal portion of the right coracoid of *Grus melitensis.* Letters as in fig. 3.

5, 5 *a,* 5 *b.* Anterior, distal, and posterior aspects of the distal extremity of the left tibio-tarsus of *Grus melitensis.* *a,* extensor bridge; *b,* tubercle on same.

6. Anterior aspect of the distal portion of the left tibio-tarsus of *Grus antigone.* Letters as in fig. 5.

7, 7 *a,* 7 *b.* Imperfect cervical vertebra of *Gyps melitensis.* *prz,* prezygapophysis; *ptz,* postzygapophysis.

June 3, 1890.

Prof. Flower, C.B., LL.D., F.R.S., President, in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of May 1890:—

The total number of registered additions to the Society's Menagerie during the month of May was 152, of which 96 were by presentation, 19 by birth, 24 by purchase, 2 were received in exchange, and 11 on deposit. The total number of departures during the same period, by death and removals, was 86.

Amongst these special attention may be called to the following:—

1. A pair of the Hartebeest Antelope (*Alcelaphus caama*), obtained by purchase May 5. Like most of the South-African Antelopes, this species is now becoming very scarce and is seldom imported. We have had no specimens of it in the Society's Gardens for the past ten years.

2. A pair of Beatrix Antelopes (*Oryx beatrix*), presented by Col. E. C. Ross, C.S.I., H.B.M.'s Consul-General at Bushire. This Arabian representative of the Antelopes of the genus *Oryx* is a