Catalogue of the Feline Fossils in the Taunton Museum.

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IT is commonly considered that the bones of *Felis spelæa* and still more of other species of *Felis* are rare in the cavern and other deposits of the Pleistocene period in England; but a large number of these bones having been found in the collections which were purchased by this Society from the Rev. Mr. Williams and Mr. Beard, we think that it will be for the interest of science that a list of them should be published, which we have endeavoured

to make useful by inserting descriptions of the more remarkable specimens, and by observations on the different parts of the animals, and of those most nearly related to them, whether fossil or recent. We have, also, by the courtesy of the Council of the Palæontographical Society, been enabled to give an opportunity to a limited number of those who may feel an interest in the subject, to possess a set of illustrations of the catalogue.

I.*

The differences between the skeletons of the larger species of known recent *Felis* are extremely slight, and are confined to very few parts of the animal, individual variation entirely obliterating specific distinction in almost every part of the skeleton. In the skulls, however, we find minute characters which appear to be constant in each of the two largest living species, and these must be our guide in the distinction of the fossil forms.

The skull of the lion can alway be distinguished from that of the tiger by the comparative flatness of the top of the skull, (the "frontal bones") (11); there being always in the tiger a slight median furrow, bounded by slight longitudinal elevations. These "frontals" are united to those immediately behind them (the "parietals") (7), by a suture, which is always nearer the large "post-orbital processes" *(t)* in the lion than in the tiger; the position of this suture gives what may be readily understood as a more short waisted aspect to the lion's skull than to the tiger's when looked at from above, as in Pls. VII and X. In the tiger the lower part of the opening of the nostrils is contracted, so that a sort of step or curve of treble curvature is formed on the inner surface of the "inter-

* The numbers and letters attached to the names of parts of the skull refer to those in Pls. VI, VII, VIII, XI, X.

maxillaries" (22), or anterior bones of the upper jaw; whereas in the lion this part is more open, and the step, if it exists, is very slight.[1] The upper points of the "nasal bones" (15) project further into the "frontals" in the tiger than in the lion, so that a line joining the upper points, "frontal processes" *(i)* of the "maxillaries" (21), by which they are united to the "frontals," always cuts off a portion of the "nasals" in the tiger, whereas it always falls entirely on the "frontals" in the lion. The upper points of these "frontal processes" are always more pointed in the lion than in the tiger, in which animal they are truncated.[1] In the lion the small "posterior palatal foramen" *(j)* is always nearer the posterior edge of the palate than in the tiger, when skulls of equal size are compared. The anterior bone of the base of the skull, (excluding the vomer) the "presphenoid" (9), is furnished with a central longitudinal ridge in the tiger, which is almost entirely absent in the lion. The inferior boundary of the lower jaw is straight or concave in the tiger, whereas in the lion it is always more or less convex, frequently forming a large projection near the middle of the jaw, this is called the "ramal process" (Pl. I *a*), this shews an approach to the form of the jaw of the hyæna. The "ramal process" is seen in its greatest extent in the genus Otaria and other forms of seal.

These characters are founded on the examination of above one hundred and fifty skulls of lion and tiger of all ages and sizes, and from many localities. We find that other distinctions which have been insisted on by anatomists are not constant, and are therefore not of specific value.

[1] Owen. Proceedings of the Zoological Society of London, January 14th, 1834.

In all the above points *Felis spelæa* agrees with lion and differs from tiger; and in somewhat similar points, but not always the same, the smallest skulls of *Felis spelæa* differ from the largest of panther and jaguar, the size alone in all but one or two exceptional cases forming an easy means of differentiation. The only differences we can discern between what we must now call the fossil and recent lions are, that we have found no recent lions so large as the largest fossil, and the limbs are, as far as we can judge from bones which apparently belong to the same skeleton at Taunton, were frequently stouter in the fossil than in the recent animal,[2] and this observation also applies to the teeth and to the lower jaw (see the gigantic No. 16 of the catalogue). But still we find other bones, including nearly perfect skulls, from all parts of the skeleton, which can be exactly matched in size as in every other particular by bones of the recent animal, and there is a complete series connecting the largest and smallest bones; so that we have no alternative but to state, that we believe that there is no specific difference between them, and that the largest *Felis spelæa* was nothing but a powerful variety of the existing lion.

Three other fossil species have been described which are about the size of lions and tigers. One, *Felis atrox*[3], was a native of America, and of this a figure of the lower jaw has been published by Dr. Leidy. The apparent position of the "ramal process" in this jaw afforded presumptive evidence of the difference between this animal and *Felis spelæa*, but we have recently cleaned a jaw from Bleadon, No. 16 of the catalogue, in which the ramal process is in

2 Ossemens fossiles, Cuvier, ed. 1825, vol. iv., p. 454.

3 Transactions American Philosophical Society, New Series, Vol. x, 153, Pl. 138.

exactly the same place as in Leidy's fossil—we can find no other point of difference; we consequently, till other portions of the animal are discovered consider that the specific difference of the two species is not demonstrated.

The next is *Felis aphanista* of Kaup,[4] from the miocene of Darmstadt; of this the anterior molar of the lower jaws, $\overline{PM\,3}$, is nearly as large, and almost exactly of the same form, as that immediately succeeding it, $\overline{PM\,4}$, in this shewing an approximation to the jaguar, the lynx, and some other smaller *Feles*. Whereas in the lion, tiger, and *Felis spelæa* this tooth is of a very different form, as may be seen by our subsequent description and the plates. The remains of *Felis aphanista* have been recently identified as those of a species of *machairodus* by M. Gaudry.

The third is *Felis cristata* of Dr. Falconer,[5] a miocene (pliocene?) species of the Western Sub-Himalaya. This differs from our animal by the much greater width and shortness of the bones of the face, particularly of the inter-orbital portion and the "nasal bones," as well as by the greater projection of the "nasals" into the "frontals," in this single respect resembling the tiger; a most marked distinction, from which it takes its specific name, is the

[4] Oss. foss. de Darmstadt, Carnivora, Pl. II.

[5] Asiatic Researches, Vol. xix, Pl. 21. Falconer's Palæontological Mems. (posthumous) Vol. ii, Pl. 25, fig. 1, 2, 3, p. 315. It will be seen that I have come to a conclusion on the affinities of this remarkable animal, different from that of the learned naturalist whose loss all lovers of truth deplore. The ounce is so rare an animal that till recently no skull of it was known to exist in this country, and in the most recent memoir on the *Felidæ*, (Dr. Gray, Proc. Zool. Soc., 1867, p. 262), the only skull figured is an imperfect specimen, taken from a skin, both of which were in the British Museum. We think it probable that Dr. Falconer could not have had any knowledge of the skull of this animal, for the extraordinary resemblance to *Felis cristata*, in one of its chief characteristics, could hardly have escaped his searching eye. A more perfect skull of the ounce exists in the College of Surgeons.

enormous height and strength of the sagittal and lambdoid crests, in which it surpasses any *Felis* we know of. In the former character, the shortness and width of the bones of the face, the Indian fossil bears a most striking resemblance to the ounce, *Felis uncia*, of the size of a small panther, from Thibet. This resemblance is so striking, and the two differ so much from any other species of cat in this particular, that we can hardly doubt that the ounce is the last representation of a race of short and wide-faced cats, that long since inhabited the central high region of Asia. *Felis cristata* varied in size from that of a large lion to that of a large panther, about the same amount of variation as that of lion, tiger, or *Felis spelæa*. We have seen three skulls of this animal, two in the British Museum, and one in the College of Surgeons.

Our museum is especially rich in the teeth of *Felis spelæa*, The whole of the adult dentition is well represented by numerous specimens of most of the teeth, and by at least single specimens of all. These form a series, from some not exceeding the size of those of a very small lion, to some as large as any fossils which have been met with, with the exception of a gigantic upper canine which was found at Crayford in the brick-earth of the Thames Valley, by a pupil of Professor Morris, and of which a cast has been given to our museum by Mr. Boyd Dawkins.

The milk dentition is also represented by numerous specimens of all the teeth, except the upper and two of the lower incisors, of these missing teeth wé have as yet met with no specimens in any collection.

In order to describe these teeth clearly it is necessary to adopt a system of classification of the different parts of the teeth, which we believe will be found applicable to all the carnivora.

In all teeth with two or more external fangs, we shall invariably find that one external lobe of the crown is supported by two fangs, these may support other lobes as well, but they are invariably both concerned in the support of one which is usually higher and larger than the others, and which has two sharp ridges running one down the posterior edge, and the other is situated more or less on the anterior surface; this lobe we will call *(a)*. This answers to the largest lobe in single fanged teeth, and to the principal lobe in cases where there is but one external fang, though there may be other fangs on the internal side. The lobe immediately anterior to this we will call *(b)*, that posterior to it *(c)*, other accessory lobes are found anterior to *(b)*, and posterior to *(c)*; we will call the one *(d)*, the other *(e)*. These for the most part form the external row of lobes, and are usually connected by a ridge which is only broken by the clefts dividing the lobes; but which is not usually, if ever, continued into the base of the crown, and these lobes are usually supported by two fangs only, the anterior (α), the posterior (β). Of the internal lobes when they exist, we shall find one *(f)*, of which the summit is connected with those of *(a)* and *(b)* by ridges, and for the most part supported by a separate or quasi separate fang running more or less into the palate (γ); these are all we are at present concerned with. In other genera other internal lobes *(g)*, *(h)*, &c. exist, and other fangs (δ), (ϵ), &c., some of which bend round the hinder part of the tooth, and enter into the external structure. We do not intend to give a minute description of the fossil teeth, but simply to indicate the differences by which they may be distinguished from others which are likely to be found in the same localities.

A good general idea of them may be formed from

those of the common cat, as the teeth vary but little in form throughout the genus *Felis*. As there is but one species of true *Felis* of the size of the lion recognised at present in the English Pleistocene deposits, they may be easily distinguished from others of the same genus by size alone in almost every case, the only animals whose teeth are likely to be confounded with them by even the most inexperienced naturalist, are those of the hyæna, some of those of the wolf, the bear, and in a single case the glutton. When the teeth are unworn, those of the hyæna and glutton can be immediately distinguished by the surface of the enamel, which in these animals is roughened by minute wavelets which cover the surface, and which are easily visible to the naked eye; the wavelets on the feline teeth are so small, at least in the species we are describing, that the surface appears smooth and polished.

The small first and second incisors of the upper jaw, I 1, 2, much resemble each other, I 2 being the largest; they are distinguished by their short curved crowns, consisting of *(a)* with a small *(f)* which is single in I 1, but double in 1 2; the fangs are much compressed, nearly of the same breadth and thickness throughout, and slightly curved backwards. The third upper incisor I 3 is a much larger tooth, it much resembles the corresponding tooth of the fossil hyæna, and to a certain extent the lower canine of the glutton; but from both it is distinguished by the smoothness of the enamel, as well as by the greater extent of a deep excavation on the internal and posterior surface. It may be considered as a short sharply curved cone, *(a)*, with the above excavation deeply cut out of its internal surface, supported upon a subcylindrical slightly curved fang. These teeth are represented in Pl. XI fig. 2, 2′,

3, 3′, 4, 4′, 4″, the latter is the very perfect crown alone of a perfectly unworn tooth.

The canine C is sometimes of enormous size, the crown is a slightly compressed, and gently curved cone, with a slight swell on the internal and posterior base. It is distinguished from that of the bear by the somewhat greater length of the crown, and especially by two longitudinal grooves on both outside and inside of the tooth, of rather more than half the length of the crown. The posterior edge in perfect and unworn teeth is serrated; the fang is of great thickness and size in the teeth of aged animals, in growing teeth it is nearly straight on the posterior edge, and highly convex externally, but in old teeth the internal outline is strongly bulged. Very small specimens not much exceeding those of the panther in size, are easily distinguished from those of that animal by the more obtuse form of the crown, that of the panther being more acute and compressed. Pls. VI, VIII, XI, C, figs. 1, 5, 6, 7.

There are three false molars. Originally it was supposed that the first, PM 2, was wanting in *Felis spelæa*, and that this formed a distinction between it and tiger;[6] but we find that the tooth is more often present than absent in the fossil form, that it is frequently absent in all the larger *Feles*, and that it is variable in form. It appears from the alveoli to be sometimes bifanged in *Felis spelæa* as in panther, but it is usually a little peg-shaped tooth, with a low central lobe *(a)* very centrally situated, and surrounded by a stout cingulum, a ridge runs lengthwise over the crown. Pls. VI, VIII, XI, PM 2, fig. 8, 8′, (*a*). The straightness of the tooth and fang distinguishes it from

[6] Goldfuss. Mem. de la Soc. des Cur. de la Nat. tom. X, quoted by Cuvier, Oss. Foss. tom. VI, p. 454.

the small anterior molar which is sometimes found in fossil bears; the smoothness of the enamel, from the anterior false molar of the hyæna, and the central position of the cone, from the posterior true molar of the wolf, in which the cone is in a much more forward position.

We know of no tooth that can be confounded with the next tooth, PM 3. It consists of *(a)* a large compressed cone with a sharp ridge connecting it with *(b)* which is always small and sometimes hardly visible, the ridge passes over the summits of *(c)* and *(e)*, and terminates on the well developed cingulum on the posterior edge of the crown, *(c)* and *(e)*, are well developed. The crown is supported on two stout divergent subcylindrical fangs (α) and (β), the posterior shews a tendency to be double, so that the fang (γ) is indicated; and in correlation with this a slight bulge on the internal base of the crown, shews the last vestige of the internal cusp *(f)*. This is important in a theoretical point of view. Pls. VI, VIII, XI, PM 3, figs. 1, 9, 10, 11.

The great carnassial, PM 4, consists of a highly compressed cone *(a)*, *(b)* of considerable size, with a minute, sometimes obsolete *(d)* on the internal anterior edge, and a long blade-like waved cusp, which is *(c)*, *(e)* being absent, *(f)* is much smaller and is less conical than in the hyæna. The crown is supported by a stout trapezoidal compressed fang (β) posterioroly, (α) is small and tapering, generally joined by its whole length to (γ); whereas in the hyæna these two fangs are divergent. In old hyænas this tooth is much more worn then in old *Felis spelæa*. (Pls. V, VIII, XI, PM 4, figs. 1, 12, 13. The only specimen we have met with of the remaining tooth, M 1, is small. It is very variable in size and form in the lion. (See De Blainville, Ost. *Felis*, Pl. XIV, FL. barb. nub. senec. cap. ind)

The Taunton specimen is worn, but what is left of it corresponds closely with the smaller corresponding teeth of lion. It is as will be seen by the two small alveoli in Pl. VIII, set transversely in the jaw immediately behind $\underline{PM\ 4}$. The crown is composed of minute *(a)* and *(f)* with the connecting ridges. The fangs which in the Taunton tooth coalesce into one are usually double, as ascertained from the separate alveoli, these are (α) and (γ). Pls. VIII, XI, figs. 14, 14′, 14″. The arrangement of the teeth in the jaw, and the angles they make with the palate are extremely variable in all the three large species, there is a tendency in *Felis spelæa* to a more linear arrangement than is often found in the other two forms.

The lower incisors of *Felis spelæa*, $\overline{I\ 1, 2, 3}$, are much like each other in form, and the two smallest are generally near of the same size. They consist of a short slightly curved *(a)*, with a well defined *(c)*, the crown swells out from the fang (α) which is compressed and slightly curved. Pl. XII, figs. 1, 2, 2′, 2″, 3, 3′, 3″. 1 belongs to a smaller set than 2 and 3.

The crown *(a)* of the lower canine $\overline{C}$ is conical, slightly curved and compressed, serrated on the posterior edge; the anterior surface is rounded, the anterior serrated ridge passing down the middle of the anterior face, cutting off between it and the posterior ridge a nearly flat surface called the "internal area." This is shewn in Pl. XII, fig. 5. This ends in a slight tubercle *(b)*. Small lower canines are distinguished from those of *F. pardus* by the short stout cone, as in the upper teeth. Pls. I, VII, XII, $\overline{C}$, figs. 4, 5, 6. This tooth is apt to be worn on the external surface, $\underline{C}$ on the internal. It is easily to be distinguished from the upper by its possessing but one longitudinal groove on the outer surface of the crown.

We have never found $\overline{\text{PM 2}}$, in any of the larger *Feles* though it occurs rarely in the smaller forms.

$\overline{\text{PM 3}}$, the anterior false molar, is formed by a low, but typically formed crown, feline in character, consisting of *(a)*, *(b)* very small, and in many cases almost obsolete; *(c)* is small but distinct, while *(e)* simply appears as a slight bulge on the cingulum, which is well developed posteriorly. It is supported on two large tapering fangs nearly parallel in the large specimens, but widely divergent in the smaller. These varieties are shown in Pls. I, VI, XII, figs. 7, 8, 8′, 9.

$\overline{\text{PM 4}}$ is much larger than $\overline{\text{PM 3}}$ in *Felis spelæa*, lion, tiger, and panther, whereas in *Felis aphanista* and jaguar, these teeth approximate in size. It consists of *(a)* large, *(b)* and *(c)* distinct and rather large, *(e)* is like that in $\overline{\text{PM 3}}$, but rather larger. The fangs (α) and (β) are strong, subcylindrical, but tapering and slightly divergent, (β) sometimes shews signs of being double, thus indicating the existence of (γ), but there is no trace of the correlated cusp, *(f)*. Pls. I, VI, XII, figs. 10, 11, 11′, 12.

The sectorial, $\overline{\text{M 1}}$, consists of the lobe *(a)* which is highly inclined backwards, so that its posterior sharp ridge is perpendicular, the anterior cutting edge being nearly horizontal, a largely developed *(b)*, nearly equalling *(a)* in size, *(d)* is rudimentary, and the cingulum feebly developed; the anterior fang (α) is trapezoidal in outline, much compressed, and (β) is small peg-like, and divergent from (α) Both these last teeth are frequently worn externally, thus keeping up the cutting edge of the interior enamel. The corresponding tooth in all species of hyæna always has a more or less developed and sometimes complicated *(c)* and *(e)*, while in *Felis (c)* is sometimes not to be found at all, and otherwise is extremely small; *(b)* is also comparatively

larger in hyæna than in *Felis* and the cingulum is very evident anteriorily. Pls. I, VI, XIII, figs. 13, 14, 14′, 15.

On comparing the above teeth with lion and tiger, we find that there is no constant difference between them. *Felis spelæa* certainly affords teeth which would by a modern hunter be considered gigantic; but others figured in our plates are about the average size of those of lion.

Milk Teeth. The upper milk incisors of *Felis spelæa* we have not met with. The upper milk or deciduous canine DC, is considerably larger than any we have met with in young skulls of lion and tiger, and the crown is more regular, though it is essentially the same in form; resembling to a great extent the permanent lower canine, $\overline{C}$, except that the "internal area" in DC occupies nearly the whole of the internal surface. The cusp (*b*) is distinct but very small, there are no grooves either on the inside or outside of the tooth. The whole tooth is compressed, and the internal base hollowed out, so that the crown of C has ample space for growth, the fang is usually hollow. Pl. XIII, figs. 2, 2′, 5.

The first milk molar DM 2 is a small peg-like tooth closely resembling PM 2 in form, but much smaller. We have met with but one example, that represented in Pl. XIII, figs. 2, 2′, that represented in fig 1″ in the same plate, is borrowed from 2. It precisely resembles the same tooth in the young lion.

The second milk molar DM 3 is a very peculiar tooth, and can be mistaken for no other that we are acquainted with. It is formed of a compressed (*a*), much higher than the rest of the tooth, (*b*) and (*d*) are both well developed, (*c*) is a long waved blade like (*c*) in PM 4 but more compressed. (*b*), (*c*), and (*d*) are all nearly of the same height, a very sharp ridge runs over the whole of the lobes, giving a sharp

trenchant edge to the whole tooth, deeply concave externally on the plan. Pl. XIII, fig 1″. (*f*) is almost rudimentary and flattened as if scraped away. The fangs (α) and (β) are nearly of the same form, rectangular, highly compressed, generally hollow and divergent, and (γ) also divergent at right angles from the plane of (α) and (β), is cylindrical, and lies entirely on the palate. These are clearly shewn in Pl. XIII, fig. 6. We have many examples of these teeth in our museum, they are all larger and finer than any recent feline teeth we have met with, but otherwise closely resemble those of lion. Pl. XIII, figs. 1, 1′, 1″, 6.

DM 4, the last milk molar is a very curious tooth, it performs the office of the small tubercular M 1 of the adult, as DM 3 performs that of PM 4; but it is constructed on the same plan as PM 4, though so different in form and appearance. It consists of a minute (*a*), (*b*) is well developed for the size of the tooth, (*c*) exists, but it is very small, and in very slightly worn recent teeth it is obscure. This part of the tooth is supported by a wide flat fang, resting nearly flat on a slight depression of the alveolar border, this shews a tendency to become double and evidently represents (α) and (β); (γ) is cylindrical, large, and divergent from (α) and (β), and supports a small but distinct (*f*). The single specimen we have seen is represented in Pl. XIII, figs. 1, 1′, 1″.

The only milk incisor we have met with is the third and largest of the lower jaw, $\overline{\text{DI 3}}$. It closely resembles a minute $\overline{\text{I 1}}$ in form; but is still smaller, and the fang is nearly cylindrical. It is figured in Pl. XIII, fig 3, but the tooth is borrowed from another specimen, No. 45 of Catalogue.

The lower milk canine $\overline{DC}$ is a curious tooth, we have seen no other fossil tooth like it, but it closely resembles that of the lion ; the crown is highly compressed and curved, and sharply pointed, though broad at the base, convex externally, and not very sharp posteriorly ; it is slightly concave internally, and a strong ridge runs from the summit on the anterior internal edge, to a large and distinct cusp (*b*), in the internal anterior base ; the fang is highly compressed and excavated internally, Pl. XIII, figs. 3, 4, 7.

The first milk molar $\overline{DM\ 3}$ resembles a compressed $\overline{PM\ 4}$ in shape and composition. The cones (*a*), (*b*), (*c*), and (*e*) being all present, connected by a sharp ridge, (*a*) being much the largest and highest. The fangs are frequently very large and subcylindrical, and highly divergent. Pl. XIII, figs. 3, 4, 8.

The last milk molar $\overline{DM\ 4}$ resembles $\overline{PM\ 4}$ in composition, but the sectorial $\overline{M}$ in form. (*a*) and (*b*) are very like (*a*) and (*b*) in $\overline{M}$; but (*a*) is proportionally larger, (*d*) is obsolete, (*c*) is small but distinct, and a strong bulge on the base represents (*e*). The fang resembles those of $\overline{M}$, but (β) is proportionally larger, and both are more compressed. It does not differ essentially from that of lion, but is larger.

Generally speaking this large size of the milk teeth of *Felis spelæa* might be considered to indicate the specific difference of the fossil and recent lions ; but all the young lions' skulls that we have examined, are, as far as we can make out, those of animals which have been bred in captivity. Our experience of young animals bred under such unnatural conditions, would tend to shew that the structure of many parts would be stunted in its growth.

We think it probable that the skulls of young wild lions would show a very different result, at all events we do not see any reason for considering the size alone of the milk teeth, evidence of other than varietal difference between the fossil and recent animal.

II.

Catalogue of Bones of Felis Spelæa.

SKULLS.

1st.—Adult.

No.

1 Pls. I, X. Skull of large size, young adult animal, Sandford Hill Cave, from Mr. Beard's collection, cleaned and re-articulated by Mr. Bidgood. It retains a small part of each nasal in situ (15), a large part of the right palatine (20), the greater part of the right maxillary, and a small part of the left (21), a part of the right inter-maxillary (22), the large posterior premolars $\underline{PM\,4}$, and a part of the right canine $\underline{C}$, both malars (26), with the left squamosal (27), and a large part of the right, so that the proportions of the zygomatic arch are clearly seen. The frontals (11) are nearly perfect, but the supraorbital processes are abraded, the left tympanic bulla is broken, and the right almost gone, the basisphenoid (5), is all but gone, and only the lower and posterior portions of the alisphenoid are left, attached to the lower part of the orbitosphenoid and squamosals; both mastoids are imperfect; the basioccipital is present, but the exoccipitals (2) are abraded; the supra-occipital is gone, and of the paroccipitals only the left fossa remains. The petrosals are in situ and perfect. The lower jaws represented in Pl. I, figs. 1, 2, are believed to belong to this skull; they are nearly perfect, wanting only the articular condyles, the extremities of the angles, and part of the left coronoid process. The malleus, Pl. X, figs. 2, 3, which is nearly perfect, was extracted from the skull; to it also with much probability belong many other bones of the skeleton, these are marked in the Museum with a red star, and in the catalogue by a letter A.

2—3 Pl. VI, VII, VIII, IX, fig. 1. A smaller skull of an aged animal, which in size, as in every other respect, precisely corresponds with the cranium of an ordinary lion. It lay for many years in a broken condition in a box in the Museum, after its purchase with the rest of Mr. Williams' collection. Mr. Bidgood re-articulated it; and when Mr. Beard's collection was purchased, the lower jaws figured (3) in Pl. VI, were found to fit it so exactly that we have no doubt that they originally belonged to it. These were from Sandford Hill Cave, we therefore give that as the locality of the skull. It is by far the most perfect skull of the animal that has been found in England. It retains a minute portion of right nasal (15) in situ; small portions of the palatine (20), shewing the "posterior palatine foramen," Pl. VIII, (*j*); the maxillaries with their dentition, except the small transverse molar $\overline{M\,1}$, the alveoli, however, of these are very clearly seen. The inter-maxillaries (22) are perfect, but the teeth are gone; the right $\overline{I\,3}$ was diseased and lost during life. The right malar (26) and squamosal (27) are perfect, and the left nearly so. The cribriform and central plates of the ethmoid (18) are present, the former shewing like a plate of saracenic tracery when seen through the foramen magnum. The presphenoid (9), and orbitosphenoid (10) are nearly perfect; the superior portion of both frontals (11) are nearly perfect; but the orbital portions are much broken. The right tympanic (28) is perfect, but the bulla of the left is broken; the articular part of the squamosal, Pl. VIII (*h*), is perfect on both sides, and so are the lower jaws Pl. VI, with the exception of portions of the coronoid processes, and part of one of the condyles. The basisphenoid (5), alisphenoid (6), parietals (7), mastoids (8), basioccipital (1), exoccipital (2), supraoccipital (3), paroccipitals (4), and Wormian (5) are all perfect; and small parts of the lachrymals (73) are attached to the frontals and maxillaries. The petrosals appear to be perfect; but they can only be partially seen on the internal or cranial surface. Of the dentition of the lower jaw, the incisors only $\overline{I\,1, 2, 3}$, right and left are wanting. Two pieces of the palate, one shewing the posterior cusp, which has been stated to be characteristic of the lion; and the other, with part of the vomer attached are mounted with the skull, 2, a.

4 Maxillaries, inter-maxillaries, and rami of the lower jaw of very large animal. Sandford Hill Cave. Mr. Beard's collection. The maxillaries figured in Pl. XI, fig. 1. These specimens shew the entire dentition of the animal except

the lower incisors, I 1, 2, 3 right and left, I 1, PM 2 right and left, and M 1 right and left. It may be doubtful if the lower and upper jaws belong to one animal. It may be remarked that the alveoli of PM 2 shews that the tooth was in this instance bifanged.

5 Portion of right maxillary with PM 3, 4, and C. Bleadon, Beard.

6 Portion of right maxillary and inter-maxillary with PM 3, I 1, 3. Williams.

7 Portion of left maxillary and inter-maxillary with PM 3, C. Bleadon, Beard.

8 Portion of left maxillary and inter-maxillary with PM 4. Bleadon, Beard.

9 Right inter-maxillary with I 1, 2, 3. Williams.

10 Portion of right maxillary with PM 3. Bleadon, Beard.

11 ,, right maxillary with C. Williams.

12 ,, left maxillary with C. Bleadon, Beard.

13 ,, very large maxillary with C. Williams.

14 ,, maxillary with PM 3 in breecia. Bleadon, Beard.

15 ,, right maxillary with PM 4. Bleadon, Beard.

16 Large part of gigantic right lower jaw, this specimen agrees in the position of the ramal process with, while it surpasses in depth and size the figure of *Felis atrox* alluded to above, p. 106. It retains PM 3, 4, and a portion of M.

17 Portion of right lower jaw with PM 3, 4. Bleadon, Beard.

18 ,, right lower jaw with PM 4, M. Bleadon, Beard.

19 Fragments of left lower jaw in breecia, with PM 3, 4, M. Williams.

20 Portion of left lower jaw with PM 3, 4. Williams.

21 ,, left lower jaw with PM 3, 4. Williams.

22 Fragment of left lower jaw with PM 3. Williams.

23 Portion of right lower jaw with PM 3, 4, M. Williams.

24 Fragment of right lower jaw with PM 4. Bleadon, Beard.

25 ,, left lower jaw with C. Williams.

26 ,, left lower jaw with C. Williams.

27 Fragment of right lower jaw of a young animal just cutting the adult teeth with $\underline{M}$. The crown of this tooth is very fine.

28 Pl. IX, figs. 2, 3. Left squamosal of gigantic animal. Bleadon, Beard.

SKULLS.

2nd.—Young, with Milk Dentition.

29 [7] Pl. XIII, figs. 1, 1′, 1″. Left maxillary of young animal (B), shewing $\underline{DM\,3,\ 4,\ PM\,2,\ 3,\ 4,}$ as germs, and alveoli of $\underline{DM\,2,\ \&\ DC.}$ The figure of the crown of $\underline{DM\,2}$ in fig. 1″ is borrowed from (30). Williams, probably from Hutton Cave.

30 Pl. XIII, figs. 2′, 2, portion of left maxillary of young animal with part of $\underline{DM\,3,\ DM\,2,\ \&\ DC.}$ This is the only example of $\underline{DM\,2}$ we have met with. Bleadon, Beard.

30[a] Left inter-maxillary. Bleadon, Beard.

30[b] Left inter-maxillary. Williams.

31—32 Upper jaws of very young animal, with $\underline{DM\,3,\ DC.}$ Williams. The milk molars in these maxillaries were named by Dr. Falconer. 31 is figured in Pl. XIII, fig. 6, in the internal aspect.

33 Right upper jaw of very young animal with $\underline{DC}$. Sandford Hill Cave, Beard.

34 Crushed right upper jaw of young animal with $\underline{DM\,3}$, and trace of $\underline{C}$ and $\underline{PM\,3}$, as germs. Bleadon, Beard.

35 Fragments of $\underline{DM\,3}$. Bleadon, Beard.

36 $\underline{DM\,3}$ named by Dr. Falconer. Williams.

36[a] $\underline{DM\,3}$ with solid fangs. Hutton, Beard.

37—38—39—40 Four upper milk canines $\underline{DC}$. Williams. One of these is figured in Pl. XIII, fig. 5, on the inner aspect, shewing the hollow on the fang for the admission of the crown of the permanent tooth $\underline{C}$.

40[a] Upper canine. Bleadon, Beard.

41 Pl. XIII, fig 3, 3′. Right lower jaw of young animal (B) with $\underline{DM\,3,\ 4,}$ the fang of $\underline{DC}$, and a trace of $\underline{M}$. The

[7] This with the lower jaw and several other bones may well have belonged to the same animal we will call this skeleton (B).

figure is completed by copying $\overline{\text{DI 3}}$ from (45). In other respects the ramus is all but perfect, and in form closely agrees with that of a lion five months old; but it is much larger than that of any lion of corresponding age we have met with. Williams.

42 Left ramus of lower jaw (B). It has lost the milk tooth, and has only trace of the germs of the permanent dentition visible. Hutton, Beard.

43—44 Probably a pair. Right and left lower jaws of very young animal. The right jaw figured in the inner aspect in Pl. XIII, fig. 4. They retain both milk canines and both right deciduous molars, $\overline{\text{LDC, RDC, DM 3, 4.}}$ Williams. These may belong to the same animal as (31, 32).

45—46 Pair of partially crushed lower jaws of young animal, with $\overline{\text{DC, DM 3, 4,}}$ on both sides, and right $\overline{\text{I 3,}}$ figured in Pl. XIII, fig. 3. The fangs also exist of $\overline{\text{DI 1, 2,}}$ and germs of $\overline{\text{I 1, 2, M, \& C.}}$ This is an important specimen as fixing the connexion between the permanent and milk dentition of the animal and as exhibiting the only known milk incisor. Bleadon, Beard.

47—48 Portions of crushed rami, a pair, with portions of milk and permanent dentition. Bleadon, Beard.

49 Portion of left ramus, with $\overline{\text{DM 3, 4.}}$ Bleadon, Beard.

50 Fragment of right ramus, with $\overline{\text{DM 3, 4.}}$ Williams.

51 ,, of right ramus, with $\overline{\text{DM 3.}}$ Bleadon, Beard.

52 ,, left lower jaw, with $\overline{\text{DM 4.}}$ Bleadon, Beard.

53 Milk molar 3, of large size, figured in Pl. XIII, fig. 8. Williams.

54—55—56 Three milk lower canines, $\overline{\text{DC.}}$ 54 figured on inner aspect, to exhibit the peculiar cone at the base of crown. Williams.

Adult Dentition.

57 Second right incisor. Bleadon, Beard. Perfect in crown.

57ª—58—59 Three upper adult incisors. 57ª is a very perfect crown, figured in Pl. XI, figs. 4, 4′, 4″. It is a left tooth. All are from Bleadon, Beard. The first and second incisors figured in Pl. XI, figs. 1, 2, are from Col. Wood's collection. Ravens Cliff Cave, Gower.

59ª Third upper right incisor, much worn. Williams.

59[b] Third upper incisor. Williams.

60 Large canine, C, left side. Wookey Hyæna Den, from Dr. Boyd. This equals in size the large French canine figured by De Blainville, *Ost. Felis*, Pl. XV, but is much surpassed in size by a canine recently found by a pupil of Professor Morris, at Crayford, in the Thames Valley, a cast of which has been presented to the Museum by Mr. Boyd Dawkins. Figured on internal aspect, Pl. XI, fig. 6.

61 Small canine, C, right side, belongs to the same jaw as 72, figured in Pl. XI, fig. 7. Smaller canines than this have occurred to us; two belonging to Col. Wood, from Gower; one from Kent's Hole in the British Museum, and one in our own Museum, which has been recently cleaned from plaster. These shew that some fossil teeth undistinguishable in form from those of the largest *Felis spelæa*, were as small as those of the smallest existing lion.

Fig. 5 of Pl. XI is from a perfect tooth, belonging to Col. Wood from Ravens Cliff, Gower.

62—63—64—65—66 Upper canines of various sizes. These as well as 61 belonged to Mr. Williams, we have reason to believe that they are from Bleadon.

67—68—69—70 Upper canines of various sizes from Bleadon. Mr. Beard's collection.

70[a] Germ of upper canine of full size, right side. Sandford Hill Cave, Mr. Beard.

71 Fragment of upper jaw with PM 2, left side, also a part of PM 3. This is the only specimen of PM 2 of large size that we have met with. The smaller size occurs in the skull 2 on both sides, and the alveoli in the maxillaries No. 4, and in three or four other specimens; so that there is no doubt that this tooth occurs frequently in *Felis spelæa* of all sizes, though it is sometimes absent, as in other large *Feles*, it probably also varies in form considerably. Figured in Pl. XI, figs. 8, 8′.

72 Fragment of upper jaw with PM 3, which belongs to the same jaw as the tooth (61). Williams. Small, not larger than those of moderately sized lions. Figured in Pl. XI, fig. 11, right side external aspect.

73 PM 3 ordinary large size. Bleadon, Beard. Figured in Pl. XI, fig. 10, right side, internal aspect.

74 PM 3. Bleadon, Beard.

75 Germ of PM 3. Bleadon, Beard.

76—77 PM 3. Williams, probably Bleadon.

Fig. 9. Pl. XI, is from a very large tooth from Wookey Hyæna Den, in possession of Mr. Boyd Dawkins.

78 Premolar 4. PM 4, figured in Pl. XI, fig. 12, left side, external aspect. Largest we have met with.

79 PM 4 ordinary large size, figured in Pl. XI, fig. 13, right side internal aspect.

80 PM 4 a germ. These three teeth belonged to Mr. Williams, probably from Bleadon.

81 PM 4. Bleadon, Beard.

81[a] PM 4, germ. Bleadon, Beard.

82 The only known specimen of M, the small transverse tubercular molar of *Felis spelæa*. The alveoli, however, which were very shallow exist in all specimens which are sufficiently perfect to shew them, figured in Pl. XI, figs. 14, 14′, 14″. It exactly resembles the corresponding tooth of lion.

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83 First incisor lower jaw, $\overline{1}\,1$, small and worn. Bleadon, Beard. Left side.

84 $\overline{1}\,1$, large and perfect, left side. Sandford Hill, Beard.

85 $\overline{1}\,2$, right side, large and perfect. Bleadon, Beard.

86 $\overline{1}\,3$, left side, large and perfect. Williams' collection.

The incisors figured in Pl. XII are from the skulls 1 and 2.

86[a] Third right incisor. Williams.

87 Largest lower canine we have met with, $\overline{C}$, right side. Williams' collection. Figured on external aspect Pl. XII, fig. 4.

88 $\overline{C}$, right side, average size. This may be compared with the canine figured in Pl. XI, fig. 6, to shew the difference between the upper and lower canines. Figured in Pl. XII, fig. 5, internal aspect. Sandford Hill, Beard.

89 $\overline{C}$, small size. This shews the very small size of some of these teeth, and the nature of the wear in aged animals, which is on the outside of the lower and inside of the upper teeth. Figured in Pl. XII, fig. 6, external aspect. Williams.

91—92—93—94—95—96—97—97[a]—97[b] Lower canines $\overline{C}$, varying in size from those of ordinary lion to those of the large *Felis spelæa*. Williams, probably all from Bleadon.

98 Very small $\overline{C}$. Sandford Hill, Beard. It is seldom or ever, that we find lion or tiger with smaller $\overline{C}$ than this.

It differs in no respect except size from the largest teeth of *Felis spelæa*, but differs much from those of *Felis pardus*.

99 Lower premolar 3. $\overline{PM\,3}$, large size, reversed in plate. Figured in Pl. XII, fig. 7, left side, external aspect. Bleadon, Beard.

100 $\overline{PM\,3}$, average size, right side. Williams. Internal and superior aspects figured in Pl. XII, fig. 8, 8′. Williams.

$\overline{PM\,3}$, very small, with divergent fangs, left side, figured in Pl. XII, fig. 9, is from a specimen found in Wookey Hyæna Den by Mr. Boyd Dawkins.

101 $\overline{PM\,3}$. Williams. Right.

102 $\overline{PM\,3}$. Bleadon, Beard. Left.

103 $\overline{PM\,3}$. Bleadon, Beard. Right.

103[a] $\overline{PM\,3}$. Left, small. Williams.

104 The largest $\overline{PM\,4}$ from the lower jaw that we have met with, right side. Williams, probably from Bleadon. External aspect figured in Pl. XII, fig. 10.

105 Large left $\overline{PM\,4}$. Bleadon, Beard. Internal and superior aspects figured in Pl. XII, figs. 11, 11′.

106 Very small $\overline{PM\,4}$. Bleadon, Beard. Right side, the internal aspect reversed is figured in Pl. XII, fig. 12; but the matrix with which the fangs are encumbered is not represented.

107—108—109—110—111—112 $\overline{PM\,4}$ of various sizes, probably all from Bleadon. Williams' collection.

113—114—115—116—117 $\overline{PM\,4}$ of various sizes. From Bleadon Cave. Beard's collection.

117[a]—117[b] $\overline{PM\,4}$. Williams.

The large right lower molar or carnassial $\overline{M\,1}$, figured in Pl. XII, fig. 13, is from a much worn, and therefore very aged tooth, found in Wookey Hyæna Den by Mr. Boyd Dawkins.

118 $\overline{M\,1}$ from Bleadon Cave. Left side, large size. Internal and superior aspects figured in Pl. XII, fig. 14, 14′.

Figure 15 of the same plate is from a very small but aged left lower molar $\overline{M\,1}$, found in Wookey Hyæna Den by myself. It is figured on the internal aspect.

119—120—121—122—123 $\overline{M\,1}$, of various sizes, but none very small. Probably from Bleadon. Williams' collection

124 $\overline{M\,1}$, large and fine. Bleadon, Beard.

125 $\overline{M\,1}$, germ. Bleadon, Beard.

VERTEBRÆ.

126 Atlas (A). This wants the greater part of the transverse processes, but is otherwise in good condition. It is much larger than those of any lion or tiger we have met with, though it closely resembles them in general form. We have never met with the two minute notches on the anterior aspect, on the outer and upper edge of the prezygapophyses, in any other *Felis*. In our figure Pl. XIV, fig. 1, the left transverse process is restored in outline from a German specimen of somewhat smaller size, belonging to S^r^. Philip Egerton, found in the cave at Gailenreuth. We may here remark that the atlas of *Felis*, when of large size, may be at once distinguished from that of any other known animal by the great projection of the prezygapophasis, (*az*, fig. 1′) beyond the transverse processes. This fine fossil was found in Sandford Hill Cave by Mr. Beard. Pl. XIV, fig. 1 anterior aspect; 1′, superior aspect; 1″, posterior aspect.

127 The odontoid process and prezygapophyses of the axis (A). This is distinguished from the corresponding bone of the bear by its great length, and by other minute characters which can be better learnt by inspection than by the most elaborate description. It closely resembles the same bone in lion, in all except size. Sandford Hill, Beard.

128 Fourth cervical of large size. Bleadon, Beard.

129 Fourth and fifth cervical, cemented together in breccia, very imperfect. Bleadon, Beard.

130 Fifth cervical, somewhat crushed, of very large size. Bleadon, Beard.

131 Fifth cervical, small, about the size of an ordinary lion. Bleadon, Beard.

132 Sixth cervical (A). It varies from the ordinary type of *Felis* in the greater amount of inclination of the zygapophysial articulations, and in the more open curve of the external face of the neurapophyses, seen in figs. 2″, 2‴, Pl. XIV. We have found vertebræ of jaguar resembling this bone exactly in form, and an approach to it in tiger. These characters vary to some extent in all the *Felidæ;* and the other specimen we have of the sixth cervical vertebra of *Felis spelæa* exactly resembles the ordinary sixth cervical of lion. We are consequently

disposed to consider this as simply a variety of the ordinary form of the bone in *Felis spelæa*. Pl. XIV, figs. 2, 2′, 2″, 2‴.

133 Sixth cervical, imperfect. Bleadon, Beard.

134 Seventh cervical, imperfect, in breccia. Bleadon, Beard.

135—136 First dorsal vertebræ. Bleadon, Beard. These exactly agree with those of the lion in form, but are rather larger.

137 Second dorsal (A). This is a very fine and perfect fossil. It exactly agrees with a second dorsal vertebra in a mounted specimen of lion in the College of Surgeons in every respect, except that the spine is considerably longer in the fossil. It differs from the ordinary form of the larger feline second dorsals, in that the anterior edge of the spine forms a nearly straight line, whereas it is generally strongly sigmoid; the lion's vertebra above quoted, and that of a jaguar in my own possession has this character exactly as in the fossil. The hollow at the back of the spine is also not usual, but it is found occasionally in all the larger *Feles*. Sandford Hill, Beard. Pl. XV, figs. 1, 2, 3.

These two vertebræ may be considered to form in *Felis* a class by themselves, as they much resemble the cervical vertebræ in form, in consequence of the great width between their zygapophysial articulations, they may be called cervico-dorsals.

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138 Fourth dorsal. Bleadon, Beard. Imperfect, but recognisable; it may be the fifth. When the vertebræ are imperfect, and the series incomplete, one cannot pronounce with certainty as to the exact position of the bone in all cases.

138[a] Fifth dorsal, centrum only. Bleadon, Beard.

139 Seventh dorsal. Bleadon, Beard. There is sufficient left of this bone to pronounce with tolerable certainty as to its position. Pl. XVI, figs. 1, 1′.

139[a] Eighth dorsal, imperfect. Bleadon, Beard.

140 Ninth dorsal. Probably from Bleadon, Williams. Very large.

140[a] Tenth dorsal, young, nearly adult animal. Sandford Hill, Beard.

141 Eleventh dorsal. Bleadon, Beard. This vertebræ is easily known by the shortness of the spine, and by the peculiar position of the postzygapophyses (*pz*) on the base of it, as well as by the size of the anapophyses, (*a*), and metapophyses, (*m*). It is a narrower bone than the corresponding vertebra of the bear, but the fossils are stouter than the generality of recent bones.

The figured specimen is nearly perfect, and very characteristic. Pl. XVI, figs. 2, 2′, 2″, 2‴.

142—143 Eleventh dorsal. Bleadon, Beard. This exactly agrees with the above.

144—Eleventh dorsal. Bleadon, Beard. Very imperfect.

These from the third to the eleventh may be called true dorsals.

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145 Thirteenth dorsal of young animal, without epiphyses, and abraded; the zygapophyses are perfect. Sandford Hill, Beard. This form is sometimes called dorso-lumbar.

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146 Second lumbar, nearly perfect, and characteristic, (A). Figured in Pl. XVI, figs. 3, 3′, 3″, 3‴. Sandford Hill, Beard.

147 Second lumbar, young, without epiphyses, tolerably perfect. Sandford Hill, Beard.

148 Second lumbar, centrum only, old and large. Bleadon, Beard.

149 Third lumbar, a very short specimen, tolerably perfect. Bleadon, Beard. Many of the lumbar vertebræ of *Felis spelæa* rather resemble the average of those of tiger than of lion, but this is typically leonine.

150 Third lumbar, centrum only, small thin specimen. Bleadon, Beard.

151 Fourth lumbar, without epiphyses, young animal. Sandford Hill, Beard.

151[a] Fourth lumbar, centrum. Williams.

152 Fifth lumbar, without epiphyses, large young animal. Sandford Hill, Beard.

153 Sixth lumbar, without epiphyses, very large young animal. Sandford Hill, Beard.

154 Sixth lumbar, large and fine, but somewhat imperfect. Bleadon, Beard.

These two sixth lumbars differ much in the width of the postzygapophyses. 154 is probably most typical in this respect, as it is nearest the form of those of the average living *Feles*.

155 Seventh lumbar, large but imperfect. Bleadon, Beard.

155[a] Seventh lumbar, large and long, but imperfect. Bleadon, Beard.

156 Centrum of lumbar vertebræ, position uncertain.

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157 Part of the second and the whole of the third sacral vertebræ. The only British specimen of this important part of the animal we have met with; it corresponds exactly with that of the ordinary lion in form, but as usual it is larger. (A). Figured in Pl. XXVI, fig. 4.

157[a] Second caudal, without epiphyses, (A). Sandford Hill, Beard.

158 Third caudal. Bleadon, Beard.

159 Fourth caudal. Bleadon, Beard. Figured in Pl. XVI, figs. 4, 4′, lower and posterior aspects.

160 Fifth caudal. Bleadon, Beard.

161 Fifth caudal. Sandford Hill, Beard. Young adult.

162 Sixth caudal. Bleadon, Beard.

163—164—165 Sixth caudals of various sizes. Bleadon, Beard.

166 Seventh caudal. Bleadon, Beard. Fine and perfect. Figured in Pl. XIV, figs. 3, 3′, 3″, 3‴, upper and side aspects, and both ends.

167—168—169 Seventh caudals. Bleadon, Beard. Various sizes.

170 Eighth caudal. Bleadon, Beard.

171—172—173—174—175—175[a]—175[b] Eighth caudals, various sizes. Bleadon, Beard. 175[a] and 175[b] are apparently bones of very aged and somewhat diseased animals, particularly 175[b].

176 Eighth caudal, young adult. Sandford Hill, Beard. (A).

177 Ninth caudal. Bleadon, Beard. Figured in Pl. XVI, fig. 5, upper aspect.

178 Very large
179 Large
180 Small
} Ninth caudals. Bleadon, Beard.

181 Tenth caudal of moderate size. Bleadon, Beard. Figured in Pl. XVI, fig. 6, inferior aspect.

182 Tenth caudal, very large. Bleadon, Beard. Figured in Pl. XVI, figs. 7, 7′, 7″, upper aspects and both epiphyses.

182[a] Tenth caudal of very large size. Williams.

183 Eleventh caudal. Bleadon, Beard.

184 Twelfth caudal, moderate size. Bleadon, Beard. Figured in Pl. XVI, fig. 8, left side.

185 Twelfth caudal, large. Bleadon, Beard.

186 Thirteenth caudal, large. Bleadon, Beard.

187—188 Thirteenth caudals. Bleadon, Beard.

189 Fourteenth caudal, moderate size. Bleadon, Beard. Figured in Pl. XVI, figs. 9, 9′, 9″, upper aspect and both epiphyses.

190 Fifteenth caudal, anterior half. Bleadon, Beard.

191 Sixteenth caudal. Bleadon, Beard.

192 Seventeenth caudal. Bleadon, Beard.

193 Eighteenth caudal. Bleadon, Beard.

194 Nineteenth or Twentieth caudal. Bleadon, Beard.

195—196 Two small caudals from near the extremity of the tail, say 22 and 23; but it may be doubted if these belong to *Felis spelæa*, though they exactly resemble those of large lion.

STERNUM.

197 Sterneber. Bleadon, Beard. Figured in Pl. XVI, figs. 10, 10′.

198—199—200—201 Four sternebers. Bleadon, Beard. These sternebers are certainly feline, but we find so much variation in the form of these bones in the recent *Feles* that we cannot positively assign the position of each bone with exactness.

201[a] Sterneber of very young animal. Hutton, Beard.

LIMBS.

1*st.*—*Fore Limb.*

202 Scapula. (A.) Figured in Pl. XVII, figs. 1, 2, external and articular aspects. Sandford Hill, Beard. Right side.

203 Scapula, portion of. Sandford Hill, Beard. The pair of 202. (A.) Left side.

204 Scapula. Bleadon, Beard. The articular portion and a very short piece of the rest of the bone, left side.

205 Scapula. Young animal from Hutton. Right side. This probably belongs to the same skeleton as the maxillary and lower jaws 29, 41, 42. (B.)

205[a] Clavicle, imperfect, but quite recognisable. Williams.

206 Left humerus, proximal articular portion. Bleadon, Beard. Figured in Pl. XVIII, fig. 1, upper part.

207 Left humerus, distal end. Bleadon, Beard. Figured in Pl. XVIII, fig. 1, lower part.

208 Left humerus, portion of shaft towards the distal end. Bleadon, Beard. Figured in Pl. XVIII, fig. 1, middle part. This is a composite figure, founded on that of the nearly perfect humerus by Schmerling, Oss. foss. de Liege, To. II, Pl. XV, fig. 2. The outline of this is copied in light tint, on this is placed the outline of 208 in somewhat darker tint, this most closely coincides with the Belgian outline. On this again is placed the drawing of a much smaller and compressed shaft of a feline humerus from Oreston Cave, now in the Bristol Museum. The two articulations are from 206 and 207, the former closely coinciding with, and the latter a little smaller than the Belgian specimen. Thus a posterior aspect of the entire bone is presented as accurate as our means would allow of. Figure 2 of this plate is the anterior aspect of the distal end of a humerus from the Larkhall gravel near Bath, in the possession of the Rev. H. H. Winwood.

209 Humerus, distal articulation, large size. Sandford Hill, Beard. Pl. XVIII, fig. 3. (A.)

210—211 Lower part of the shafts of a pair of humeri from Sandford Hill, Beard. The preservation of the substance of these bones is most remarkable, they exactly resemble recent bones; but we have never met with the bones of recent *Felis* so large. They are therefore probably genuine.

212 Distal portion of right humerus. Bleadon, Beard.

213—214—215 Two right, and one left, humeri, distal portions. Bleadon, Beard.

216 Left humerus, distal portion. Probably from Bleadon, Williams.

217 Left humerus of very young animal, without epiphyses. Hutton, Williams. Pl. XXII, fig. 1, posterior aspect. (B.)

218 Right humerus, distal portion, pair to 217. Hutton, Beard. (B.)

219 Left ulna, proximal portion. Sandford Hill, Beard. Figured half natural size, radial aspect, Pl. XI, fig. 8; natural size, internal aspect, Pl. XXVI, fig. 2. (A.)

220 Pair to 219, small part of humeral articulation. (A.) Sandford Hill, Beard.

221—222 Part of proximal ends of pair of ulnæ, in the same state of preservation as the humeri, 210, 211. Sandford Hill, Beard.

223 Large ulna, proximal half. Figured half natural size, Pl. II, fig. 5, anterior aspect; 6, radial aspect; 7, internal aspect.

224—225—226—227—228—229—230—231—232—233—234—235 Twelve ulnæ of various sizes, from 224 which is of large size, to 235 which is not larger than the bone of an ordinary lion, proximal portions. Bleadon, Beard.

235[a] Proximal end of right ulna. Williams.

236 Shaft of right ulna. Bleadon, Beard.

237 Left ulna, without epiphyses, of young animal. Figured in Pl. XXII, figs. 2, 3, radial and internal aspects. Hutton Cave, Beard. (B.)

238 Pair to 237. Hutton Cave, Williams.

Fig. 9 in Pl. II is a representation of a small ulna, half the natural size, from Wookey Hyæna Den, in the possession of Mr. Boyd Dawkins. It exactly resembles in every respect that of an ordinary lion.

The only example of a complete ulna of *Felis spelæa* we have met with, is one found among bones which once belonged to Dr. Falconer. It is probably from the Crayford brick-earths. It is now in the British Museum. It is of the largest size.

239 Perfect radius. Figured half natural size, anterior aspect, in Pl. II, fig. 1; proximal, fig. 2; distal, fig. 3;

and of the natural size on the ulnar aspect, Pl. XXVI, fig. 1. Sandford Hill, Beard. (A.)

240 Proximal and distal portions of the pair to 239.

241 Proximal end of small radius, corresponding in size and figure with that of the ordinary lion. Figured half natural size in Pl. II, fig. 4. Bleadon, Beard.

242—243—244—245 Proximal ends and portions of shafts of four radii. Bleadon, Beard.

246—247—248 Distal ends of three radii. Bleadon, Beard.

248[a] Proximal end of right radius. Williams.

These eight vary in size, and form a series with the two preceeding them.

249 Distal end of radius of very young animal. Bleadon, Beard.

250 Proximal end of radius of very young animal. Bleadon, Beard.

251 Scaphoido-lunare, right. It is of large size, and if compared with 152, which exactly resembles in every respect that of ordinary lion, it will be seen that it differs from it by being somewhat thicker, but this character is found to be variable in recent animals, though not to the extent shewn in the fossil. Figured in Pl. XX, figs. 1, 1′, front and inferior aspects. Sandford Hill Cave, Beard. (A.)

252 Scaphoido-lunare, left, small size. Figured in Pl. XX, fig. 2. Bleadon, Beard.

253—254—255 Scaphoido-lunare of various sizes. Mounted so as to shew the different aspects. Bleadon, Beard.

256 Scaphoido-lunare. Sandford Hill, Beard.

257 Scaphoido-lunare of large size, left. Mounted with paw. Bleadon, Beard.

258 Right unciform, figured in Pl. XX, figs. 5, 5′. Bleadon, Beard.

259 Left unciform. Bleadon, Beard.

259[a] Unciform. Sandford Hill, Beard. (A.)

260 Right pisiform. Figured in Pl. XX, fig. 3, carpal aspect. Bleadon, Beard.

261 Left pisiform. Figured in Pl. XX, fig. 4, ulnar aspect Sandford Hill, Beard. (A.)

262 Left pisiform. Mounted with paw. Bleadon, Beard.

263 Left pisiform, small. Bleadon, Beard.

264 First right metacarpal. Bleadon, Beard. Pl. XXI, fig. 1.

265 First left metacarpal. Mounted with paw. Rather small. Bleadon, Beard.

266—267 First right metacarpal. Bleadon, Beard.

268—269—270—271 Second, third, fourth, and fifth metacarpals of right paw, all exactly matching. (A.) They are remarkable for their stoutness in proportion to their length. The set is figured in Pl. XXI, figs. 2, 3, 4, 5. The fourth shows a variation of the proximal articulation, the usual form is shewn in Pl. XX, fig. 6, No. 274. Sandford Hill, Beard.

272—273—274—275 Second, third, fourth, and fifth metacarpals of left paw. Mounted with paw. Proximal articulation of 274, figured in Pl. XX, fig 6. Bleadon, Beard.

276—277—278—279 Second metacarpals all of large size, proximal portions. Bleadon, Beard.

280 Third metacarpal, proximal half. Bleadon, Beard.

281—282—283—284—285—285[a] Fourth metacarpals, proximal portions, some of them are of size of ordinary lion. Bleadon, Beard.

285[b] Fourth left metacarpal. Williams.

286—287—288—288[a]—289—289[a]—290—291—292 Fifth metacarpals of various sizes. 286 perfect, of the rest more or less of the distal portion gone. Bleadon, Beard.

The figure in Pl. XXI, fig. 7, is of a very small specimen found in Wookey Hyæna Den, by Mr. Boyd Dawkins. Internal aspect.

292[a] Fifth metacarpal, left side. Williams.

293—294 Third metacarpals, wanting the distal ends. Sandford Hill, Beard.

The large third metacarpal and metatarsal figured in Pl. XIX, figs. 6, 7, are from Crayford, in the possession of Dr. Spurrell. They exceed in size any of the Somerset specimens, and are more slender, particularly about the proximal articulation, and more curved than usual for large specimens. Great variation, however, is found to exist in these particulars in both lion and tiger. We may, therefore, with much probability assume that the same may have been the case in the ancient European lion.

295—296—297—298—299 First phalanges of all the digits of the right paw. Sandford Hill Cave, Beard. These exactly correspond with each other and the metacarpals. (A.) Figured in Pl. XXI, figs. 6, 7, 8, 9, 10.

300—301—302—303—304 First phalanges of all the digits of left paw. Bleadon, Beard. Mounted with paw.

305 First phalange of first digit. Bleadon, Beard.

306—307—308—309—310—311—312—313—314—315—316—317—318—319—320—321—322—323—324—325—326—327—328—329—330—331 Twenty-six first phalanges of the different digits of the fore paw, except the first. The sizes are very various. Bleadon, Beard. 330, 331, are in breccia.

331[a] First phalange. Williams.

332—333 Second phalanges of second and third digits. Bleadon, Beard. Figured in Pl. XXI, figs. 11, 12.

334 Second phalange of fourth digit. Sandford Hill, Beard. (A.) Figured in Pl. XXI, fig. 13.

335 Second phalange of fifth digit. Bleadon, Beard. Figured in Pl. XXI, fig 14.

336—337—338—339 Second phalange of second, third, fourth and fifth digits. Bleadon, Beard. Mounted with paw.

340—341—342—343—344—345 Second phalanges of fore paw of various sizes. Bleadon, Beard.

346—347 Imperfect third phalanges, uncertain as to position. Mounted with paw. Bleadon, Beard.

348 Accessory carpal sesamoid, mounted with right paw. Bleadon, Beard.

349—350—351—352—353—354 Sesamoids of metacarpals or metatarsals, mounted with the fore paws. Bleadon, Beard.

355 Fifth metacarpal of young animal. Bleadon, Beard.

356 Fifth metacarpal of very young animal. Hutton, Beard. Figured in Pl. XXII, fig. 4. (B.)

357 First phalange, first digit of very young animal. Bleadon, Beard.

358—359—360 First phalanges of different digits of young animals. Bleadon, Beard.

361 First phalange of young animal. Hutton, Beard.

362 First phalange of very young animal. Hutton, Beard. Figured in Pl. XXII, fig. 5. (B.)

363 Second phalange, left paw, very young. Bleadon, Beard.

364 Second phalange, very young. Hutton, Beard. Figured in Pl. XXII, fig. 6. (B.)

2nd.—Hind Limb.

365—366 Pair of ossa innominata. (A.) Sandford Hill, Beard. These are probably those of an adult, but not old female. They closely agree in condition and age with the skull No. 1. When looked at in front, the inward curvature of the ossa pubis (*m*, *b*) is greater in the lioness than in the lion, so that the angle formed by the meeting of these bones, or at their symphasis, is more open in the former than in the latter. The anterior descending branch of the same bone is also larger and stouter in the lion than in the lioness, and the muscular ridges are much more strongly marked. In these respects these fossils agree with lioness. That represented in Pl. III, fig. 1, three quarters natural size, is the same bone of a large male from Crayford, if judged by the same character. It is in the British Museum. Fig. 2, is that of a diseased and mal-formed tiger, inserted in the plate by a mistake of the artist. Pl. XXVI, figs. 1, 2.

A difference has been insisted on between lion and tiger, in this bone. In tiger the length of the ilium (*a*) to the anterior edge of the acetabulum (*n*), or the articulation for the femur, is equal to that of the ischium (*h*, *f*) and acetabulum (*n*) taken together, whereas in lion the ilium is proportionately longer. But we have reason to believe, that this, though a general rule, is by no means constant; but in this the fossils agree with lion as in other parts of the skeleton. See de Blainville, *Ost. Felis*, p. 30.

367 Os pubis, with part of acetabulum. Sandford Hill, Beard. This, according to the characters laid down above is the left os pubis of a male animal, of rather greater age than the last. Figured in Pl. XXVI, fig. 3.

368 Acetabulum, with part of ilium, left side. Bleadon, Beard.

369 Left femur, proximal articulation. Bleadon, Beard.

370 Left femur, part of shaft. Bleadon, Beard.

371 Left femur, distal end. Bleadon, Beard.

These are figured in Pl. XVIII, fig. 4, in the same manner as the humerus in the same plate. The founda-

tion in light tint, is from a cast found by Sr. Philip Egerton, at Gailenreuth, which was given by Mr. Boyd Dawkins to our Museum, this is reversed in the plate. The shaft 370, is in a deeper tint, and the two extremities 369, 371, are in full tint. It will be seen that 369, 370 exactly agree with the German bone, but 371 is a little smaller. They are much larger than the corresponding bones of any lion we have met with. The distal aspect of 371 is represented in the same plate fig. 5.

372 Part of distal articulation of right femur. This is larger than 371, or the German bone. Bleadon, Beard.

373 Right femur, distal articulation, rather smaller than 371. Bleadon, Beard.

374 Portion of shaft of femur, smaller than 370. Bleadon, Beard.

375 Cast of the Gailenreuth femur, above mentioned, right side. Given to the Museum by Mr. Boyd Dawkins. Figured in Pl. XVIII, fig. 4.

376—377 Hutton. Pair of femora of young animal. (B.) Figured in Pl. XXII, figs. 7, 8.

These with the other bones of young animals in this collection are of some importance, as they show the entirely different character of the young and adult bones. They will prevent a repetition of the mistake made by M. Gervais in his "Zoologie et Palæontologie Francaises," p. 227, where he states that the smaller lion-like bones discovered by MM. De Serres, Dubrueil, and Jeanjean in the caves of Lunel Viel, were the bones of young *Felis spelæa*—"ayant encore leur dents de lait." These bones, as represented by the above authors, "Oss. foss de Lunel Viel," Pl. VII, figs. 3, 4, 5, 6; Pl. VIII, figs. 15, 16, are undoubtedly, as the authors state, the bones of adult animals of about the size of, or perhaps smaller than, the average lion. Whereas M. Gervais has mixed them up with others, also described as lions' bones, but which are doubtless those of the young *Felis spelæa*, Pl. VII, figs. 7, 8, 9, 10, and part of a lower jaw which appears, though rather doubtfully, to be that of a young hyæna with milk teeth, Pl. VII, fig. 11.

378 Patella. Bleadon, Beard. Mounted with skeleton, figured half natural size, Pl. XIX, figs. 5, 5′; full size, Pl. XXV, fig. 6.

379 Patella. Bleadon, Beard. With skeleton.

379[a]—380—381—382—383—384—385 Patellæ of various sizes. Bleadon, Beard.

385[a] Patella, small. Williams.

386 Left tibia, perfect, with the exception of the proximal epiphysis. (A.) Sandford Hill, Beard. Pl. XIX, figs. 1, 1′, 1″, half natural size, and Pl. XXV, fig. 3.

387—Proximal end of left tibia. Bleadon, Beard. Pl. XIX, figs. 2, 2′. This and the last are combined in Pl. XXV, fig. 3, which thus gives a lateral aspect of the entire bone. The two pieces exactly correspond in size, and if compared with those of recent *feles*, they exhibit the far greater massiveness of the limbs of the fossil animal.

388 Proximal end of left tibia. Bleadon, Beard. Rather smaller than the last.

389 Distal end of right tibia. Sandford Hill, Beard. An older bone than 386, and rather smaller.

390—391—392—393—394—395—396 Portions of shafts and distal ends of tibiæ. Bleadon, Beard. Some of these hardly exceed those of lion in size, shewing that the greater average massiveness of the limb was rather varietal than specific. The greater extent of the attachment for the tendon of the patella on the anterior crest seen in fig. 2 of Pl. XIX, and fig. 3 of Pl. XXV, is probably due to the greater size of the limb and in correlation with it.

397 Tibia of very young animal. (B.) Hutton, Beard.

398 Right fibula, without epiphyses. (A.) Sandford Hill Cave, Beard. Young adult animal. Figured, half natural size in Pl. XIX, fig. 3′; and full size in Pl. XXV, fig. 4.

399 Distal end of left fibula. Bleadon, Beard. Figured, half natural size in Pl. XIX. fig. 4; full size in Pl. XXV, fig. 5.

400 Right fibula of very young animal. Bleadon, Beard. Figured in Pl. XXII, fig. 9. (B.)? if from Hutton.

401 Fibula of very young animal, not the pair of 400. Bleadon, Beard. Though these two bones were among the Bleadon bones of Mr. Beard, they more resemble in condition and character the Hutton bones.

402 Astragalus, left. Bleadon, Beard. This exactly corresponds in every particular with the calcaneum, 419,

and the figured navicular, cuboid, and mesocuniform, excepting that the navicular belongs to the right foot. They all probably belonged to one animal which was large, old, and powerful; all these bones are more or less roughened by exostosis. Figured in Pl. IV, fig. 1.

403 Astragalus, right. Sandford Hill, Beard. Mounted with paw. (A.)

404 The pair of 403. (A.)

405 Astragalus. Sandford Hill, Beard.

406—407—408—409—410—411—412—413—414—415—416—417—418 Thirteen astragali of various sizes, from that of 402 to 417 which is not larger than that of ordinary lion. Bleadon, Beard.

419 Left calcaneum. Is part of the set mentioned above—see 402, Pl. IV, fig. 2. Bleadon, Beard.

420 Right calcaneum. (A.) Sandford Hill, Beard. Mounted with paw.

421 Left calcaneum. (A). The pair of 420. Mounted with paw.

422—423—424—425—426—427—428—429—430—431—432—433—434—435—436—437 Sixteen calcanea of various sizes, from that of 419 to others which are not larger than that of lion. 435 is probably hardly adult, though nearly of full size.

438 Calcaneum of very young animal. Hutton, Beard. (B.)

439 Right scaphoid, probably belonged to the same animal as 402, &c., reversed figure in Pl. IV, fig. 3. Bleadon, Beard.

440 Right scaphoid, mounted with skeleton. (A.) Sandford Hill, Beard.

441 Left scaphoid, mounted with skeleton. Bleadon, Beard.

442 Small right scaphoid, size of that of the lion. Bleadon, Beard.

443 Right ectocuniform. Bleadon, Beard. Figured, front aspect reversed, in Pl. IV, fig. 5, and the external aspect in fig. 5′.

444 Left ectocuniform, mounted with skeleton. Bleadon, Beard.

445 Right ectocuniform. Sandford Hill, Beard. (A.)

446 Left cuboid, belongs to set mentioned 402. Bleadon, Beard. Figured, front aspect in Pl. IV, fig. 4; internal aspect, fig. 4′; inferior aspect, fig. 4″.

447 Left mesocuniform, belongs to set mentioned 402. Figured in Pl. IV, fig. 7. Bleadon, Beard.

448 Endocuniform? Figured in Pl. IV, fig. 7. Bleadon, Beard.

This bone is mutilated, if restored as shewn by the outline in the figure, it would resemble a large feline endocuniform; but the lower articulation by which it articulates with the rudimentary metatarsal of the first digit, differs somewhat from that of lion. The corresponding joint of the only specimen of the metatarsal is also broken, so that we cannot say whether the variation was carried out in that bone as well.

The remaining figures in Pl. VI of the ectocuniform of lion and tiger, shew that the posterior process of the bone in *Felis spelæa* resembled that of lion, and differed from that of tiger, but though this is generally the case, it is now found that it is not an absolutely constant character.

449 First rudimentary metatarsal of first digit, left side. Figured in Pl. V, fig. 1. Bleadon, Beard. This is a rare and curious bone, not easily to be recognised as a metatarsal at all.

450 Second metatarsal, right side. Sandford Hill, Beard. Figured in Pl. V, fig. 2. (A.)

451 Third metatarsal, right. Bleadon, Beard. Mounted with paw.

452—453 Fourth and fifth metatarsals, right. Sandford Hill, Beard. Figured in Pl. V, figs. 4, 5. (A).

454 Second metatarsal, wants distal articulation, left. Bleadon, Beard.

455 Third metatarsal, right side. Sandford Hill, Beard. Figured in Pl. V, fig. 3, reversed. (A.)

456 Fourth metatarsal, right side. Sandford Hill, Beard. (A.)

457 Fifth metatarsal, right. Bleadon, Beard.

The above nine specimens are mounted with the skeleton.

458—459 Second metatarsals, proximal portions. Bleadon, Beard.

460—461—462—463—464—465 Six second metatarsals of various sizes. The two first nearly perfect and of large size. The others proximal portions only. Bleadon, Beard.

466—467—468—469—470 Five third metatarsals of various sizes. Bleadon, Beard.

471—472—473 Three fifth metatarsals. Bleadon, Beard.

These shew considerable variation in form, as do those of recent lion and tiger; some are nearly straight, and very stout; others are slender, and curved.

474—475—476—477 First phalanges of hind paw, right side. Bleadon, Beard. Figured in Pl. V, figs. 6, 7, 8; 9. The are all of large size.

478—479—480—481 First phalanges of hind paw, left side. Bleadon, Beard. Mounted with paw.

482—483—484—485—486—487—488—489—490—491—492—493—494—495—496—597—498—499—500—501—502—503—504—505 Twenty-four first phalanges of hind paw. These are distinguished in general by their flatness, width, and shortness, from those of the fore foot. Bleadon, Beard.

506—507 Two first phalanges of hind paw, proximal portions only. (A.) Sandford Hill, Beard.

508—509 Two first phalanges of hind paw. Williams.

510—511—512—513 Second phalanges of right hind paw. Bleadon, Beard. Figured in Pl. V, figs. 10, 11, 12, 13.

514—515—516 Second phalanges of second, third, and fourth digits of left hind paw. Bleadon, Beard.

The above seven are mounted with skeleton.

517—518—519—520—521—522—523—524—525—526—527—528 Twelve second phalanges of hind paws. Bleadon, Beard.

These exhibit in a marked manner the variation in size of the animal.

529—530—531 Three third phalanges. 531 is probably that of the fifth digit of the hind paw, as it is the smallest in the recent animal, this is figured in Pl. V, fig. 14. Bleadon, Beard.

532 A fine specimen of a large claw bone, or third phalange, but it is not so large as the great claw bone of the first digit of the fore paw would certainly have been. Williams.

533 to 563 are fragments of metacarpals and metatarsals, distal portions only. These vary in size from the largest described to that of small lion. Bleadon, Beard.

564 Distal portion of metatarsal. Sandford Hill, Beard.

565 to 587 Twenty-three fragments of canines. Bleadon, Beard.

588 to 615 Twenty-one fragments of molar dentition. Beard, and Williams.

After the first sheets went to press it was found that 30^a, 30^b, had been accidentally misplaced; they should have been 15^a, 15^b, being adult bones. Also, 33 should have been 53, it being a lower jaw with $\overline{DC}$.

III.

Felis (Leopardus) Pardus.

Linnæus.

In various parts of Germany and France, as well as in Gibraltar, remains of a *Felis* of the size of the panther of Africa and Western Asia, have been found, which were identified with that animal by Dr. Falconer.

The evidence of the existence of this animal in England is confined, as far as we know, to the few specimens in the Taunton Museum, and a single canine in the possession of Lord Enniskillen, which he kindly placed at our disposal, for the purpose of our larger work on the Pleistocene Mammalia of Great Britain, and of which a figure is given in Pl. XXIV, fig. 4.

The recent species of *pardus* has been considered as divided into two, the panther properly so called, and the leopard, the former consisting of the larger and stouter, and the latter of the more slender and smaller individuals; but an examination of a large number of skulls, skeletons, skins, and living animals, has convinced us that the differences are only varietal, and that the conclusions of the more modern naturalists on the subject are correct. At the same time there exists in Northern China, and, we

have reason to believe, also in other parts of Eastern Asia, a species which is undoubtedly distinct, and which differs from the panther in the comparative length of the nasals and frontal processes of the maxillaries, exactly as the tiger differs from the lion. This species has been named by Dr. Gray, (Proc. Zool. Soc., 1867, p. 264), *Leopardus Chinensis;* Dr. Gray describes a third species, under the name of *Leopardus Japonensis*, (Proc. Zool. Soc. 1862, p. 262); and the fourth is the jaguar of America, *Leopardus onca*, Linn. These are the only living species with which it is necessary to compare our fossils.[8]

From those of the jaguar, the teeth of our animal are distinguished by the more slender, delicate, and compressed form, as contrasted with the stout conical look of the cusps of those of the jaguar. But the fossils most closely agree with those of the panther and Chinese leopard. To which of these two the fossils belong it is of course somewhat uncertain, until entire skulls of the animal are found. We must consequently rest content with the probability that they are identical with the cotemporary fossils of France and Germany, and that they are those of the panther.

Of the fossil species, *Felis pardoides* of the Norfolk Pliocene (Owen B. Foss. Mam. p. 169) appears to differ in the lowness of the crown of $\overline{M\,1}$, while the *Felis* of the same size, recently described by M. Gaudry from the Miocene (?) of Attica, appears to differ solely in the greater length and slenderness of the limbs. But these determinations are from small portions of the animals, and are therefore to some extent provisional.

[8] A fifth species of leopardus of large size has been recently described by M. Milne-Edwards, from Northern China. Ann. Sci. Nat. sec. 5, t. VIII, pp. 374-76.

IV.

Catalogue of Bones of Felis Pardus.

616 Right upper canine of nearly adult animal, $\underline{C}$.

617 Right lower canine of apparently the same individual, $\overline{c}$.

618 Right lower carnassial, $\overline{M\,1}$, of the same.

These three teeth belonged to Mr. Williams. They have the appearance of bones from the Hutton Cave, but some resembling them in condition have been found at Bleadon. They are figured in Pl. XXIV, figs. 1, 2, 2′, 2″, 3.

619 Upper milk canine, right, $\underline{DC}$. This is much smaller than that of the lion, but it is of the same general form, except that the cone is more slender, and there is a bulge forming a marked cingulum round the base. Bleadon, Beard.

620 Left femur, the upper half without the epiphyses. This appears to be the bone of a nearly adult animal; it coincides in measurement, except that it is a little shorter, with the femur of a very large panther from West Africa in the Museum of the College of Surgeons. Bleadon, Beard. Figured in Pl. XXIV, fig. 5.

621 Left ulna, upper portion, imperfect. This is the bone of a smaller, but older animal than the last; it agrees closely with the ordinary form of the ulna of panther. Bleadon, Beard.

622 Second left metatarsal, young animal, but nearly adult. Bleadon, Beard.

623 Fourth right metatarsal, very young. Williams, probably Bleadon.

We consider these two last bones are small for those of *Felis spelæa* of corresponding age; but they appear to agree with our estimate of those of panther.

V.

Felis Caffer.[9]

Demarest.

Several bones of *Felis* somewhat larger than those of specimens of wild cat have occurred frequently in various

[9] Strictly, M. Demarest calls the species *Caffra*.

caves in Western Europe. These have been variously described as belonging to the ordinary wild cat of Europe, *Felis catus*, *Felis catus magna*, &c., by different authors. A considerable part of a jaw of about this size exists in the Taunton Museum, agreeing most closely in condition and appearance with the fossils from Bleadon Cave. On comparing this fossil with all the specimens of European wild cat I could obtain access to in the British Museum, and that of the College of Surgeons, I found that it presented such differences that I could not consider it as belonging to that species. The jaw was more compressed and deeper, the teeth were proportionately much smaller. I found also a character which appeared constant in all the specimens of *Felis catus* that I could consider authentic; this is a considerable thickening of the inner alveolar border of the lower jaw, just as it rises on the base of the coronoid process, which throws the carnassial $\overline{M\,1}$ outwards. This does not exist in the fossil, $\overline{M\,1}$ rising perpendicularly from the jaw. In examining the series of the smaller cats in the College of Surgeons, I found that the lower jaw of *Felis Caffer* precisely agrees with our fossil in the most minute measurements, and particularly in the upright position of $\overline{M\,1}$. A subsequent examination of the larger series of skulls in the British Museum, confirmed this determination, the agreement between the several specimens of *Felis Caffer* and our fossil being closer than I had ever met with in comparing fossil with recent animals. The fossil differs from the whole of the small leopardine group, and from the smaller lynxes by the very small size of the teeth; from the different species of chaus of India and North Africa, including the serval, by the comparatively smaller $\overline{M\,1}$, and from all the smaller species of *Felis* by size and proportion of the teeth, the details of these differences space

will not permit me to describe. In fact I could not find one that resembled it, except those of the species I have indicated above. One specimen alone labelled *Felis catus* agreed with it in any respect; but this had been many years in the museum, and no other locality than the Zoological Garden was given it. This skull differed in every respect from every authentic specimen of the European wild cat I could discover. I consequently suspect that some error existed in the name given to it in the gardens, particularly as the original habitat is unknown.

On comparing our fossil with various figures of fossil jaws of *Felis*, I found a close agreement with that which is figured by M. Schmerling, (Oss. foss. de Liege, p. 2, Pl. XVIII, figs. 13, 14,) as the jaw of *Felis catus magna*, and with that from Kent's Hole, figured in Mr. Ennery's Cavern Researches, the original of which is now in the British Museum. I have also found a few other bones which appear to belong to a *Felis* of the size of *Felis caffer*, which I therefore ascribe to the same species.

Of course this determination is provisional, and it may be considerably modified by the discovery of more perfect specimens. Dr. Gray in a supplement to the Memoirs on the *Felidæ* above quoted, considers *Felis caffer* a variety of *Chaus lybicus*, together with other supposed species in which he includes the small *Felis maniculata*, (Proc. Zool. Soc. 1867, p. 398.) My own observations on the skulls of these animals appear to me to prove that if all the forms he quotes are varieties of one species, they are constant as far as osteological characters indicate, in most if not all instances. The form denoted by the name *caffer* at present is found only in Southern Africa.

VI.

Catalogue of Bones of Felis Caffer.

624 Left mandible, with $\overline{\text{PM 3}}$, $\overline{\text{M 1}}$, it wants the anterior and posterior portions. Williams, probably Bleadon. Figured in Pl. XXIV, figs. 6, 6′, 6″.

625 Left femur, proximal half. Williams, probably Bleadon. Figured in Pl. XXIV, fig. 7.

626 Radius of nearly adult animal, without epiphyses. Hutton, Beard.

627 Fibula, probably of the same individual.

628 Left deciduous carnassial, $\overline{\text{DM 3}}$. This tooth is much too large for that of *Felis catus*, and would agree with that of *Felis caffer* in size. It is therefore referred to that animal. Williams.

VII.

Felis Catus.

A few feline bones occur in the Taunton collection of the size of those of the wild cat of Europe. The existence of this animal in deposits of this age has been demonstrated by Professor Owen, (Br. Foss. Mam. p. 172); so that it is not necessary for me to enter further into the description of the animal. No teeth or jaws have occured to us in Somerset; but in the river deposits of the Thames, jaws and other parts of the animal occur which prove beyond a doubt that it was cotemporary with the mammoth in these Islands.

VIII.

Catalogue of Bones of Felis Catus.

629 Eleventh dorsal vertebra. Banwell, Beard.

630 First lumbar vertebra. Banwell, Beard.

631 Scapula, young, but nearly adult, a very perfect specimen. Hutton, Beard.

632 Right ulna, proximal portion. Bleadon, Beard. Figured in Pl. XXIV, fig. 9.

633 Fifth metacarpal. Hutton, Beard.

IX.

We subjoin a few measurements of the skulls, teeth, and principal bones. Much more detailed tables of measurement, shewing the relative size of specimens of all the known bones of *Felis spelæa*, when compared with those of the lion, tiger, and in some cases with those of jaguar, puma, and panther, are given in the monograph by Mr. Boyd Dawkins and myself, published by the Palæontographical Society.

Measurements,

In inches and decimals of inch.

1.—SKULLS.

	No. 1.	Nos. 2, 3.	No. 4.
Basal length	13·00[1]	11·55	
Zygomatic width ..	9·10[2]	9·20	
Extreme length		13·22	
Minimum width at orbits ..	3·20	2·66	
Width of maxillaries at $\overline{PM\,4}$	5·12	5·00	6·00
Length of upper molar series ..		2·74	3·40
Lower jaw, symphasis to condyle ..	9·90	9·00	
Do. circumference anterior to $\overline{PM\,3}$ ..	5·40	4·08	
Do. do. post to $\overline{M\,1}$ ..	5·50	4·70	
Height of coronoid process from angle ..	5·00		
Canine to $\overline{M\,1}$ inclusive ..	5·00	4·50	
Molar series, lower ..	2·40	1·70	

1 Estimated from placing the skull on the jaws belonging to it.

2 Probably a little below the true width, owing to unadvoidable slight distortion of the skull in re-articulating it.

2.—MILK DENTITION.

Upper.

	DC No. 37	DC No. 40	DM 2 No. 30	DM 3 No. 24	DM 3 No. 36	DM 4 No. 29
Antero-posterior measurement	0·46	0·40	0·14	1·00	0·93	0·28
Transverse do.	0·32	0·30	0·11	0·33	0·28	0·50
Height ..	0·89	0·70	0·90	0·50	0·50	0·23
Circumference ..	1·18	1·00	0·30	2·33	2·28	1·37

Length of molar series 1·56.

Lower.

	DI 3 No. 45
Length of crown ..	0·22
Width ..	0·20
Circumference ..	0·50

	DC No. 54	DC No. 56	DM 3 No. 53	DM 3 No. 41
1 Antero-posterior meast. ..	0·50	0·44	0·70	0·51
2 Transverse do. ..	0·21	0·21	0·27	0·22
3 Height ..	0·72	0·72	0·45	0·34
4 Circumference ..	1·20	1·10	1·60	1·30

	DM 4 No. 45	DM 4 No. 41
1	0·85	0·67
2	0·35	0·30
3	0·55	0·44
4	2·00	1·70

Length of molar series	No. 45	No. 41
	1·30	1·20

3—ADULT DENTITION.

Upper.

	$\frac{I\,1}{}$ Col. Wood	$\frac{I\,2}{}$ Col. Wood	$\frac{1\,3}{}$ No. 58	$\frac{C}{}$ No. 60	$\frac{C}{}$ Col. Wood	$\frac{C}{}$ Crayford
Length	1·29	1·32	1·59	5·25	3·35	6·0
Height of crown	0·40	0·43	0·59	2·42	1·30	2·9
Width of do.	0·23	0·29	0·51			
Circumference				3·76	2·20	4·1
	$\frac{PM\,2}{No.\ 71}$	$\frac{PM\,2}{in\ No.\ 2}$	$\frac{PM\,3}{Mr\ Dawkins}$	$\frac{PM\,3}{in\ No.\ 2}$	$\frac{PM\,4}{No.\ 78}$	$\frac{PM\,4}{in\ No.\ 2}$	$\frac{M\,1}{No.\ 82}$
Antero-posterior meast..	0·36	0·31	1·27	0·89	1·75	1·34	0·52
Height of crown ..			0·70	0·55	0·40[1]	0·30[1]	
Width of do. ..	0·28	0·27	0·58	0·44	0·50	0·40	
Circumference ..	1·04	0·92	2·99	2·46	4·20	3·31	

[1] From the base of the crown to the cleft between (*a*) and (*c*).

Lower.

	$\frac{I\,1}{from\ 2}$	$\frac{I\,2}{from\ 1}$	$\frac{I\,3}{from\ 1}$	$\frac{C}{No.\ 87}$	$\frac{C}{Col.\ Wood}$	$\frac{PM\,3}{No.\ 99}$	$\frac{PM\,3}{Mr\ Dawkins}$
1 Length ..	1·04	1·35	1·65	5·46		0·78	0·60
2 Height of crown ..	0·29	0·35	0·45	2·10	1·30	0·42	0·34
3 Width of do. ..	0·20	0·26	0·42	1·10	0·90	0·46	
4 Circumference ..	0·60	0·80	1·05	3·25	2·10	2·10	1·62

Lower.—(continued).

	$\frac{PM\ 4}{}$	$\frac{PM\ 4}{}$	$\frac{M\ 1}{}$	$\frac{M\ 1}{}$
	No. 104	No. 106	No. 108	Mr. Sanford
1	1·25	0·90	1·30	1·03
2	0·64	0·41	0·60	0·56
3	0·88	0·58	0·45	0·30
4	3·10	2·28	3·25	2·60

Length in the incisors and canines, signifies the entire length from point of the crown to end of the fang; in the molars, the antero-posterior measurement.

VERTEBRÆ.

	4th Cervical		6th Cervical	1st Dorsal		8th Dorsal	11th Dorsal
	No. 128	No. 129	No. 132	No. 135	No. 136	No 139[a]	No. 141
Length of centrum ..	1·62	1·44	1·45	1·30	1·44	1·62	1·70

	2nd Lumbar	5th Lumbar	7th Lumbar	3rd Sacral	3rd Caudal	5th Caudal
	No. 146	No. 152	No. 155	No. 157	No. 158	No. 160
Length of centrum ..	2·15	2·96	2·10	1·30	1·35	1·67

	6th Caudal	8th Caudal		9th Caudal		10th Caudal		12th Caudal		14th Caudal
	No. 162	No 170	No 175	No 177	No 178	No 181	No 182	No 184	No 185	No. 189
Length of centrum ..	1·75	2·00	2·20	2·12	2·60	2·40	2·65	2·12	2·30	1·95

SCAPULA.

	No. 202	No. 204
Circumference at neck	6·55	7·00
Length of glenoid cavity	3·00	3·00
Width of ditto	2·30	
Height of spine from surface ..	2·25	
Acromion to surface of glenoid cavity ..	1·10	0·90

HUMERUS.

	Belgian bone Schmerling No. 208	No. 206	No. 207
Entire length ..	13·75		
Minimum circumference ..	5·50		
Transverse proximal articulation ..		4·10	
Vertical ditto ..		4·60	
Transverse distal ditto ..			3·00
Vertical ditto ..			4·30

RADIUS.

	No. 239
Length	12·75
Minimum circumference	3·50
Transverse humeral articulation	1·42
Vertical humeral articulation	2·10
Transverse carpal articulation	1·40
Vertical carpal articulation	2·48

ULNA.

	No. 219
Depth below radial articulation	2·69
Thickness at same part	1·00
Circumference of same part	6·00
Humeral articulation, linear vertical ..	3·00
Transverse articulation, linear vertical ..	2·10

OS INNOMINATUM.

	British Museum specimen		No. 365	
Total length	14·50		13·25	
Vertical height of ilium? ..	3·50?		3·25	
Transverse diamr. of acetabulum	2·25		2·25	
Longitudinal ditto ..	2·20	7·30	2·25	6·75
Acetabulum to end of ischium ..	5·10		4·50	
Acetabulum to end of ilium ..	7·42		6·78*	

* Somewhat less than the true length, as the bone is abraded.

FEMUR.

	Gailenreuth bone	No. 269	No. 271
Length	16·65		
Minimum circumference ..	5·00		
Transverse proximal articulation ..	3·00	3·10	
Vertical ditto ..	3·00	3·10	
Transverse distal ditto ..	2·20		3·20
Vertical ditto ..			5·80

TIBIA.

	No 387	No. 388	No. 386
Transverse proximal articulation	3·60	3·20	
Vertical ditto ditto	2·80	2·60	
Transverse distal ditto			3·00
Vertical ditto ditto			1·90
Minimum circumference			4·00

CALCANEUM.

	No. 416	No. 437
Length	5·60	5·00

Explanation of Plates.

PLATE I.

Fig.

1—Lower jaw, external aspect. No. 1.

2—The same, internal aspect.

3—Posterior aspect of part of lower jaw from Crayford, in possession of Dr. Spurrell.

PLATE II.

Half of natural size.

1—Radius. No. 239.

2—The same, proximal articulation.

3—The same, distal articulation.

4—Radius, small form. No. 241.

5—Ulna, proximal portion. No. 223.

6—The same, external aspect.

7—The same, internal aspect.

8—Ulna. No. 219.

9—Ulna, small, from Wookey Hyæna Den. Mr. Boyd Dawkins' collection.

PLATE III.

Two-thirds of natural size.

1—Os innominatum. Thames' brickearths, Crayford, in British Museum, probable male.

2—Os innominatum. Tiger, mal-formed animal, inserted in plate through error of Artist.

PLATE IV.

Tarsus.

1—Astragalus. No. 402.

2—Calcaneum. No. 419.

3—Scaphoid or navicular. No. 439.

4—Cuboid. No. 446.

4′—The same, internal aspect.

4″—The same, external aspect.

5—Ectocuniform. No. 443.

5′—The same, internal aspect.

5″—The same bone, lion.

5‴—The same bone, tiger.

6—Mesocuniform. No. 447.

7—Endocuniform. (?) No. 448.

PLATE V.

Hind paw.

1—1st	metatarsals	No. 449.
2—2nd		No. 450.
3—3rd		No. 451.
4—4th		No. 452.
5—5th		No. 453.

6— } 1st phalanges { 2nd } digits { No. 474.
7— } { 3rd } { No. 475.
8— } { 4th } { No. 476.
9— } { 5th } { No. 477.

10— } 2nd phalanges { 2nd } digits { No. 510.
11— } { 3rd } { No. 511.
12— } { 4th } { No. 512.
13— } { 5th } { No. 513.

14—3rd phalange, lateral aspect, 5th digit (?) No. 531.

15— } Sesamoids. Nos. 349 and 350.
16— }

PLATE VI.

Skull, lateral aspect. Nos. 2, 3.

PLATE VII.

The same, superior aspect.

PLATE VIII.

The same, inferior aspect.

PLATE IX.

1—The same, occipital aspect.

2—Squamosal of large animal, inferior aspect. No. 28.

3—The same, superior aspect.

PLATE X.

1—Skull, superior aspect. No. 1.

2, 3—Malleus, from the same skull.

PLATE XI.

Upper dentition, adult.

1—Maxillaries and inter-maxillaries; No. 4, points of the canines slightly restored.

2, 2′—First incisor, outer and posterior aspects. From Ravenscliff, Gower, in the possession of Col. Wood.

3, 3′—Second incisor, outer and posterior aspects. From Ravenscliff, Gower, in the possession of Col. Wood.

4, 4′, 4″—Third incisor, outer lateral, coronal, inner lateral aspects. No. 57.

5—Right canine, outer lateral aspect. Ravenscliff, Col. Wood.

6—Left canine, inner lateral aspect. No. 60.

7—Right canine, small, outer lateral aspect. No. 61.

8, 8′—Coronal and outer aspects of premolar 2, PM 2. No. 71.

9—Premolar 3, PM 3, outer aspects. Wookey Hyæna Den, Mr. Boyd Dawkins.

10—PM 3, inner aspect. No. 73.

11—PM 3, inner aspect. No. 72.

12—PM 4, outer aspect. No. 78.

13—PM 4, inner aspect. No. 13.

14, 14′, 14″—Molar, M 1 posterior, anterior, coronal aspects. No. 82.

PLATE XII.

Lower dentition.

1, 1′—First left incisor, anterior and posterior aspects, from skull No. 2.

2, 2′, 2″—Second left incisor, anterior, posterior and inner aspects, from skull No. 1.

3, 3′, 3″—Third left incisor, anterior, posterior and inner aspects, from skull No. 1.

4—Canine, $\overline{C}$, outer aspect. No. 87.

5— Ditto inner aspect. No. 88.

6— Ditto outer aspect, old and small animal. No. 89.

7—Premolar 3, PM 3, outer aspect. No. 99.

8, 8′—PM 3, inner and coronal aspects. No. 100.

9—PM 3, inner aspect, small. Wookey Hyæna Den, Mr. Boyd Dawkins.

10—PM 4, outer aspect. No. 104.

11, 11′—PM 4, inner and coronal aspects. No. 105.

12—PM 4, inner aspect. No. 106.

13—Molar or carnassial, $\overline{M\,1}$, worn, outer aspect, large old animal. Wookey Hyæna Den, Mr. Boyd Dawkins.

14, 14′—$\overline{M\,1}$, lateral and coronal aspects. No. 118.

15—$\overline{M}$, small old animal. Wookey Hyæna Den, Mr. W. A. Sanford.

PLATE XIII.

Milk dentition, portions of skulls of young animals.

1, 1′, 1″—Left maxillary, outer, inner, and inferior aspects. No. 29.

N.B.—The figure of $\underline{\text{DM}\,2}$ is inserted in 1″, from No. 30.

2, 2′—Left maxillary, outer and inner aspects. No. 30.

3, 3′—Lower jaw, outer and posterior aspects. No. 41. The incisor inserted from No. 45.

4—Lower jaw, inner aspect, younger animal than the last. No. 43.

5—Upper milk canine, $\underline{\text{DC}}$, inner aspect. No. 37.

6—Upper milk molar 3, $\underline{\text{DM}\,3}$, inner aspect. No. 31.

7—Lower milk molar, $\overline{\text{DC}}$, inner aspect. No. 54.

8—Lower milk molar 3, $\overline{\text{DM}\,3}$, inner aspect. No. 53.

PLATE XIV.

Vertebræ of the neck and tail.

1, 1′, 1″—Proximal, distal, and dorsal aspects of the atlas. No. 126.

The restoration in light tint is slightly enlarged from a specimen from Gailenreuth in possession of Sir Philip Egerton, Bart.

2, 2′, 2″, 2‴—Dorsal, lateral, proximal, and distal aspects of sixth cervical. No. 132.

3, 3′, 3″, 3‴—Proximal, dorsal, lateral, and distal aspects of seventh caudal. No. 166.

The following letters are used for the different parts of the vertebræ, in Pls. XIV, XV, XVI. *c*, centrum; *ae*, anterior epiphysis; *pe*, posterior epiphysis; *n*, neurapophysis; *ns*, neural spine; *pa*, parapophysis; *pl*, pleurapophysis; *hy*, hypapophysis; *d*, diapophysis; *a*, anapophysis; *m*, metapophysis; *az*, pre-zygapophysis; *pz*, post-zygapophysis; *nc*, neural canal; *v*, canal for vertebral artery.

PLATE XV.

1, 1′, 1″—Proximal and distal aspects of second dorsal. No. 137.

PLATE XVI.

Vertebræ, Sternum

1, 1′—Seventh dorsal, distal and lateral aspects. No. 139.

2, 2′, 2″, 2‴—Eleventh dorsal, lateral, distal, proximal, and dorsal aspects. No. 141.

3, 3′, 3″, 3‴—Second lumbar, proximal, lateral, dorsal, and distal aspects. No. 146.

4, 4′—Fourth caudal, ventral and distal aspects. No. 159.

5—Ninth caudal, dorsal aspect. No. 177.

6—Tenth caudal, ventral aspect. No. 181.

7, 7′, 7″*—Tenth caudal, dorsal, proximal, and distal aspects. No. 182.

8—Twelfth caudal, lateral aspect. No. 184.

9, 9′, 9″—Fourteenth caudal, dorsal, proximal, and distal aspects. No. 189.

10, 10′—Third sterneber, lateral and ventral aspects. No. 197.

PLATE XVII.

1, 2—Distal and outer, or superior surfaces of right scapula. No. 202.

PLATE XVIII.

Limbs.

1—Composite figure of palmar aspect of left humerus. Nos. 206, 207, 208. See description attached to 208.

2—Anterior aspect of left humerus. Larkhall gravel, belonging to the Rev. H. H. Winwood. See 208.

3—Distal articulation of left humerus. No. 209.

4—Composite figure of left femur. Nos. 369, 370, 371. See description 371.

5—Distal aspect of 371.

PLATE XIX.

Hind Limb—Half natural size.

1, 1′, 1″—Anterior, proximal, and distal aspects of left tibia. No. 389. 1′ shews the sectional aspect of the bone, the epiphyses being absent.

2, 2′—Anterior and proximal aspects of proximal portion of left tibia. No. 387.

3—Posterior aspect of right fibula. No. 398.

4—Distal end of left fibula, external aspect. No. 399.

5, 5′—Anterior and posterior aspects of patella. No. 378.

Natural size.

6—Second left metacarpal of gigantic size.

7—Ditto ditto ditto

These two are from the lower brickearths, Crayford, in the Thames Valley. They belong to Dr. Spurrell.

* This may be the eleventh, but if so it is most gigantic ; it is large for the tenth.

PLATE XX.

Tarsus.

1, 1′—Scaphoido-lunare, anterior and inferior aspects. No. 251.

2—Scaphoido-lunare, anterior aspect, small. No. 252.

3—Pisiform, right, carpal aspect. No. 260.

4—Pisiform, left, ulnar aspect. No. 261.

5, 5′—Unciform, right, anterior and inferior aspects. No. 258.

6—Fourth metacarpal, proximal portion, anterior aspect. No. 274, the ordinary form.

7—Fifth metacarpal, interior aspect. Small specimen from Wookey Hyæna Den, belonging to Mr. Boyd Dawkins.

PLATE XXI.

Fore Paw.

1—First right metacarpal. No. 264.

2, 3, 4, 5—Second, third, fourth, and fifth metacarpals. Nos. 268, 269, 270, 271.

6, 7, 8, 9, 10—First phalanges of right paw. Nos. 295, 296, 297, 298, 299.

11, 12—Second phalanges of second and third digits. Nos. 232, 233.

13—Second phalange of third digit. No. 234.

14—Second phalange of fourth digit. No. 235.

PLATE XXII.

Limbs of young animal.

1—Left humerus. No. 217.

2, 3—Left ulna, radial and internal aspects. No. 237.

4—Fifth metacarpal. No. 356.

5—First phalange. No. 362.

6—Second phalange. No. 264.

7, 8—Pair of femera, anterior and posterior aspects. No. 276, 277.

9—Fibula, right. No. 400.

PLATE XXIII.

Felis pardus.

1—Upper canine, $\underline{C}$, inner aspect. No. 616.

2, 2′, 2″—$\overline{M\,1}$ outer, coronal, inner aspects. No. 618.

3—Lower canine, $\underline{c}$, inner aspect. No. 617.

4—Lower canine from Banwell, belonging to the Earl of Enniskillen, outer aspect.

5—Femur, posterior aspect. No. 620.

Felis Cafer.

6, 6′, 6″—Left lower jaw, outer, inner and superior aspects. No. 624.

7—Femur, posterior aspect of proximal end. No. 625.

Felis catus.

8—Inner and superior aspects of jaw, from the Crayford brick-earths, in possession of Mr. Wickham Flower.

9—Proximal end of ulna. No. 632.

PLATE XXV.—*SUPPLEMENTARY.*

Felis spelæa.

The figures in this plate represent bones of the natural size, of which figures of half size are given in other plates, but in no case is the same aspect repeated.

1—Radius, ulnar aspect. No. 239.

2—Ulna, internal aspect. No. 219.

3—Composite figure of tibia formed by uniting Nos. 386, 387.

4—Fibula, tibial aspect. No. 398.

5—Fibula, distal end, tibial aspect. No. 399.

6—Patella, lateral aspect. No. 378.

PLATE XXVI.—*SUPPLEMENTARY.*

Felis spelæa.

The figures in this plate are of the natural size, that of the Os innomination in Pl. III. is of two thirds of natural size, and is probably that of a male, whereas Nos. 1, 2 are probably those of a female.

1, 2—Left outer and right inner aspects of a pair of ossa innominata wanting the greater part of the ossa pubis, female. Nos. 365, 366.

3—Outer aspect of left or pubis of male, with part of the acetabulum and ilium. No. 367.

4—Part of the second and third sacral vertebræ. No. 157.