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RULES

AND

REGULATIONS

OF THE

SOUTH AFRICAN INSTITUTION.

CAPE TOWN:
PRINTED BY W. BRIDEKIRK, HEEREGRACHT.

1830.

At a public Meeting held on Wednesday, the 17*th June,* 1829, *in the Public Library, Cape Town, of which* A. OLIPHANT, Esq. *His Majesty's Attorney General, was Chairman, it was resolved,—That an Institution be established for investigating the Geography, Natural History, and general Resources of South Africa.*

RULES, REGULATIONS, &c.

1. The Institution to be supported by contributions, subscriptions, and such other resources as may arise.

2. The Institution to comprise Ordinary Members, Privileged Members, Honorary Members, Corresponding Members, Resident and Non-Resident Annual Subscribers, unlimited in number.

3. Persons desirous of becoming Members, to be ballotted for. No person shall be eligible to be ballotted for either as an ordinary or corresponding Member, but upon the recommendation of two Members. The proposition for the admission of such ordinary or corresponding Member, to be read at the General Monthly Meeting immediately preceding that at which the ballot will take place, and to be placed in a conspicuous part of the Institution Rooms during the interim.

4. Ordinary Members to contribute not less than three Pounds Sterling, and an annual subscription of one Pound ten Shillings.

5. Ordinary Members, *only*, shall have the power to vote in all questions and matters relating to the property and management of the Institution.

6. Any person making a donation to the Institution of not less than ten Pounds Sterling, to become a privileged Member, and to have the power of introducing five Visitors to the Museums and Gardens.

7. Honorary Members to be persons eminent for scientific acquirements, resident abroad. To be elected at Annual General Meetings. To have the right of access to all Museums and Gardens, and other such Repositories of the Institution, and of attending all Monthly and Annual Meetings, when in the Colony.

8. Corresponding Members to be persons residing in the Colony or elsewhere, who are likely to promote the objects of the Institution, and to have the privileges of honorary Members.

9. An annual subscription of one Pound, ten Shillings, to entitle the Subscriber to a free entrance to all General Meetings of the Institution, and to the Museums or other Repositories belonging to it, and the privilege of introducing to the latter, his family resident in his house.

10. Any person having the right to attend General Meetings, may bring one Visitor with him; but the name of such Visitor, and of the Member introducing him, must be first communicated in writing to the Chairman, and read aloud by him.

11. Any person residing in the Colony beyond eight miles from Cape Town, who subscribes fifteen Shillings Sterling, or contributes articles to the Repositories of the Institution to that amount yearly, shall have, when in Cape Town, the privileges of resident Annual Subscribers.

12. The Institution to have Office-Bearers, to be elected from the Ordinary Members, viz:

A Patron.—To have the option of being Chairman at all Meetings when present, and all the privileges of a privileged Member.

A President.—Who shall, when present, be Chairman of all Meetings at which the Patron does not officiate.

Four Vice Presidents.—One of whom shall, by rotation, act as Chairman in the absence of the President.

A Treasurer.

Two Secretaries.—One to have the charge of the Minutes, and the other of the Correspondence.

Nine Members of Council.

13. All Office-Bearers, except the Patron, to be elected annually at a General Meeting of the Members. Two-thirds of the Members of Council to go out annually by seniority.

14. All Office-Bearers to be Members of Council, with the same rights as other Members; except that the Chairman officiating, *only,* shall have a casting vote.

15. Six Members of Council, including the Chairman, to be a quorum.

16. Committees of Council to consist of at least two Members, with power to associate with themselves, for particular purposes, any Member, or Annual Subscriber to the Institution, whom the Council may approve of.

17. Vacancies in the Council to be filled up by nomination of the existing Council.

18. Neither the President, nor Vice Presidents, shall hold the Office of Treasurer or Secretary.

19. The Council shall have the power to make By-Laws, to remain in force until the next General Meeting; and power to sell or exchange duplicates of the Articles in the Repositories of the Institution, and to purchase others; but all sales or purchases of other property belonging to, or for the Institution, must be sanctioned by a Meeting of ordinary Members. The Council to have the sole charge of the funds of the Institution, for the general purposes thereof, except in so far as they may be controled by a vote of the Ordinary Members for any particular purpose.

20. General Monthly Meetings to be held for the purpose of hearing Essays and Communications, or Reports of the Committees, if directed by the Council; and for other business.

21. All Papers to be read at the General Monthly Meetings, shall be first examined and approved by the Council.

22. Persons desirous of making communications verbally, must give notice of the subject thereof to the Council: any person present may make observations thereon.

23. General Annual Meetings to be held on the first Monday in June of each year, at 12 o'clock, A. M and General Monthly Meetings on the last Wednesday of every month, at 8 o'clock, P. M.

24. The Secretaries to open the General Annual Meetings, by a Report of the Proceedings of the Institution during the past year. The other Officers to detail the state of their several Departments; and the President, or another Member deputed by him, shall close the Meeting by a Discourse on the progress of knowledge during the past year.

25 The Museum, Gardens, and other Repositories of the Institution, to be open to the public, under Regulations to be fixed by the Council for the time being.

LIST OF MEMBERS, &c.

Privileged Members.

His Excellency the Hon. Sir G. L. Cole, G. C. B.

Ordinary Members.

Rev. Dr. Adamson,
Captain Bance,
Mr. Beddy,
The Hon. Lieut.-Colonel Bell,
Mr. Biel,
Mr. P. G. Brink,
Mr. J. Brink,
Mr. Bowie,
Mr. M. van Breda,
Mr. von Buchenroder,
Mr. E. A. Buyskes,
Mr. C. Burton,
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Major Cloete,
Mr. H. Cloete,
Mr. D. Cloete,
Mr. Collison,
Rev. I. Cooke,
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Mr. Dickinson,
Major Dundas,
Dr. Dyce,
Mr. Ebden,
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Mr. Hawkins, H. C. Service,
Dr. Horstock,
Lieut.-Col. Holloway, Royal Engineers,
Mr. H. Hertzog,
Mr. Hamilton,
Mr. Jardine,
Mr. Joubert,
Rev. E. Judge,

Mr. J. Jones, H. C. Service,
Mr. Laing,
Mr. von Ludwig,
Mr. Mackrill,
Mr. Miller,
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Mr. Nourse,
Mr. Oliphant,
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Mr. Poupart,
Mr. Reid,
Mr. Reits,
Captain Ronald,
Mr. Skirrow,
Dr. Smith,
The Hon. Mr. Stoll,
Mr. G. Thompson,
Sir John Truter,
Mr. J. Verreaux,
Mr. Villet,
Mr. Watermeyer.

W. Bridekirk, Printer.

THE

SOUTH AFRICAN

QUARTERLY JOURNAL.

EDITED AT

THE SOUTH AFRICAN LITERARY AND SCIENTIFIC INSTITUTION.

Vol. II.

SEPTEMBER 1835.

CAPE TOWN:

Printed at the 'Albion Press,' *Grave-street;*

AND PUBLISHED BY A. S. ROBERTSON, SHORTMARKET-STREET;

AND

J. M. RICHARDSON, 23, Cornhill, London.

SOUTH AFRICAN

QUARTERLY JOURNAL.

SECOND SERIES.

No. I. OCTOBER—DECEMBER, 1833. **Part I.**

An Account of the Amakosae, a tribe of Caffers adjoining the Eastern Boundary of the Cape Colony. By N. Morgan, Esq. Assistant Staff-Surgeon.—(Abridged.)

[Read at the South African Institution.]

The formation of a colony of Europeans at the Cape of Good Hope in 1652, was the precussor of a great change in the condition of the Hottentot people, the original possessors of the country. A settlement was obtained by treaty, and an increase of territory at various times was gained both by seizure and conquest, so that from possessing a few acres of land only in 1659, the Dutch at the time of the British conquest, were masters of nearly all the country, and the original proprietors of the land were the servants of their conquerors.

Though the desire to possess land capable of affording pasturage for their flocks induced many of the Dutch inhabitants to leave the protection of their own Government and seek it in a dangerous and troubled country, yet others made this removal from a far more culpable motive, in seeking thereby to obtain possession of the flocks of the defenceless natives. This was done under various pretences, sometimes by interfering in their internal disputes and acting as the avengers of those who were sufferers; at others, by boldly attacking the neighbouring kraals and taking the flocks of the scattered people. These causes produced a state of hostility against the European in the surrounding tribes, and by them they were often deprived of their illgotten herds. Their lands and houses were frequently ravaged and destroyed, and their lives even at times fell a sacrifice to this general feeling of depredation and revenge. On these occasions the Colonists always had recourse to their own Government for protection; and the usual plan to remedy these evils was, to unite to the colony that part of the land so inhabited. While the Dutch were thus gradually encroaching on the Hottentot limits from the Westward, the Caffers were making encroachments on the East, and about 1786, when the district of Graaff-Reinet was formed, the two parties of Conquerors, or aggressors, came in contact; and the Caffers still

pursuing their system of aggrandisement became often opposed to the Colonists.

The Hottentot tribes were then possessors of little territory; it was bounded by the sea on the South, by the Colonists on the West and North, and by the Caffers on the East. The attacks of the Caffers had always been conducted on the principle of extermination, for by them the Hottentot men were always slain if they could not effect their escape. The women were taken, and their cattle driven away; the Caffers succeeding them in the possession of the depopulated land; and by these means they had occupied the Hottentot Country as far West as the Sunday River; and the Frontier Colonists often suffered in like manner as the Hottentots had done from their predatory inroads.

The Hottentots had now dwindled into a very few tribes; some of these began to unite with the Caffers in their aggressions on the colony, others threw themselves entirely under the protection of the colonists; and the remaining part of their country in 1798 fell into the hands of the Europeans. Since that time the Caffers have been forced to relinquish that part of the country that is to the west of the Keiscamma River, and since 1825 have ceased to assail the colony, and have become a nation trading with the European Colonists on the system of mutual interest and benefit.

The country at present occupied by the Caffers, is nearly of a rectangular form,—the northern side is bounded by an extensive chain of mountains; the country beyond which is, to the north-east, inhabited by the Tambookies, on the north-west by the Bushmen. The eastern part is bounded by the Bashee River and the country of the Tambookies; the western part joins the colony, and the south-east borders on the sea. It is 150 miles in length; its breadth is uneven, being from 30 to 90 miles; containing about 10,000 square miles.

These mountains are very high, and are covered with large forests, in which various timber trees, most of them common to the colony, flourish luxuriantly. The woody summits intercept the clouds that are wafted by the winds from the ocean, and furnish constant supplies to the numerous springs which form the sources of the many rivers flowing from them toward the sea. Though the distance from their source to their union with the ocean is comparatively short, yet the body of water in these rivers is very considerable; and the unevenness of the ground through which they have cut their tract, the rocky projections that frequently divide their streams, and the falls that constantly occur between the interior and the shore, cause them to impart a charming freshness and vivacity to the surrounding country through which they find their way.

The face of the country is very uneven, the higher ground being formed of plains and ridges from which branch a number of kloofs and ravines, each of which opens into some stream or river. The upper part of the country, or that nearest the mountains, is the least intersected by these ravines, and is also more open than the lower part next the sea, which is full of ridges. The whole country abounds with the Mimosa tree; and the courses of the rivers, streams, and ravines are frequently concealed by thick bush; the different species composing which are the same as are met with in similar situations in the colony. The climate is very healthy, and does not materially differ from that of the eastern part of the colony. The winter is here generally the dry season. The spring is showery, but the greatest falls of rain happen in the summer and autumn, and are always attended with thunder, lightning, and hurricanes of wind. The rivers and streams which before were fordable, almost everywhere at this time become torrents, rushing with inconceivable rapidity, and swelling to a great height, so as to render them for a time quite impassable. The water, however, soon runs off, and they sink to their former level. The mouths of none of these rivers are navigable.

I shall now endeavour to give some account of the general history of these nations, first premising that it is very difficult if not impossible to acquire any correct knowledge on this head, as they have used no method of recording past events. Their oral traditions scarcely appear to have preserved any thing of their origin; and every person seems to speak only from his own recollection. If you desire intelligence of an earlier date than he is able to give, you are referred to an older person, who, perhaps, may give a little more information of former events. Thus every affair of past times is very imperfectly obtained, and even the most recent circumstances are collected by the enquirer with the greatest difficulty.

The only tradition among them of their origin is, that the first Caffers came out of a cave, which they describe as being situated to the eastward, somewhere between Caffraria and Tambookieland, and from thence they spread over the country towards the setting sun. The name of the cave they call U'Daliwe. Dala is the word they use for the Creator, and Uka Dalwa the Creation.

They say that there was only one Chief formerly, and that from him came all the different Captains of the present time; and, by a Chronological Table compiled by a Missionary of the Glasgow Missionary Society, it appears that, in all instances, the various chiefs trace their families into the same stock, at a few generations back, probably about two centuries ago, during the time of a chief of the name of Um Conde.

I am led therefore to conclude that about this period the first division of these people began, and also that their first encroachments upon the Hottentot country took place about this time. That the Hottentots at one time possessed the country to the westward of the Kay River is extremely probable, because the names of all the rivers from thence, in that direction, are still in their language, as well as many to the eastward as far as the Bashee.

The Mandanhie tribe derive their origin from Um Dangie, a son of Un Conde, and as these were the most advanced Caffers, having possessed themselves of the country as far to the westward as the Sunday River, it is probable he was the first chief who led out his people from the main body and sought a new possession by conquest from the Hottentots.

Um Bange, a grandson of Un Conde, is the head from whom the chief of those Caffers now on the Buffalo River has descended. The chief U'Queno derives his origin from U'Lango, a son of U'Palo, and with his people formerly possessed the country to the west of the Fish River, but it was during the time of U'Calika that the greatest and last division took place, when all the people to the westward of the Kai River became in a manner free from the immediate controul of the direct descendants of Un Conde. U'Henza is the present chief in this line, and is acknowledged to be the head of the whole people, and still possesses some kind of authority or influence over all the other chiefs, for to him are referred all disputes respecting authority, guardianship of minors, &c. and he frequently of himself also inquires into and decides upon affairs of major and minor importance to the nation, and his interference is not thought any encroachment on the power or authority of the other chiefs, but they readily submit to his opinion on the subject.

The only regular accounts of their proceedings that can be collected, commences in the time of U'Caleka, the third in descent from Un Conde, who it appears ruled absolutely over all the people for some time, until his brother U'Raraba, who was a man of great influence, and much esteemed by the whole nation, resisted some of his unpopular measures, and was joined by a numerous party. A civil war ensued, and ended in the division above alluded to: from that time he acted independently of his brother. At the death of U'Caleka the part of the Government that remained to him descended to his son U'Kanta, who was succeeded about twelve years ago by U'Henza, He it is who now rules over those Caffers who inhabit the country to the East of the Great Kai River. U'Raraba, the brother of U'Caleka, who caused the division of the people, succeeded in establishing his authority. He

was a great warrior, and had many children, who, in the wars in which their father was engaged against the Hottentots and Tambookies, became celebrated for their bravery. The principal mentioned are Un Lawie, Un Acube, Un Thlambe, Un Tsusa, and Un Nukwa. Un Lawie was much liked by his father, both on account of his being his successor, and for the great daring and bravery he manifested in the field. He fell in battle, having gone with a great command to make an attack upon the Tambookies—it proved unsuccessful; the Tambookies fighting bravely, killed many of their enemies, and among them Un Lawie himself. U'Raraba being much enraged at this loss called all his people to arms, and with them immediately proceeded to avenge his son's death. To insure success they took a large number of bullocks, (at that time the Caffers used these animals in their wars.) The Tambookies having heard of their preparations assembled a large force to defend themselves, and received U'Raraba's attack with great courage and skill. When the oxen, as was the custom, were driven on them to break their ranks, and put them into confusion, the Tambookies divided themselves and mixed with the oxen, and having got command of these animals, they drove them back on the Caffers, and succeeded in breaking through and scattering them. A very great slaughter followed, and among them who fell was U'Raraba himself, with several of his children; and all the cattle became the prize of the conqueror. By these two disastrous campaigns the Caffers sustained so great a loss that they never afterwards dared engage in any great enterprize against the Tambookies, but turned their arms against their less courageous enemies, the Hottentots and Bushmen.

By the death of U'Raraba and Un Lawie, the sovereignity fell to Gika, the son of the latter, but he being very young Un Thlambe, his uncle, was chosen Regent. Un Thlambe is spoken of as having been at this time a very powerful and just Ruler, and not only able to defend his own part of the country, but also to protect the independence of that of Gika; and he appears, during the minority of Gika, to have acted as supreme Ruler of the whole nation West of the Kai River.

This difficult task he is said to have managed with great prudence and address, for, by promising to abandon the rule when the young Chief was of age sufficient take to the power into his own hands, he was supported by most of his brothers, and retained the Government against all opposition. But when Gika assumed the Government of his own kingdom, and expected that U'Thlambe's would also be under his authority, U'Thlambe refused, and being supported by the chiefs of U'Henza's people, several battles were fought with various success. But Gika appears in the end to have been successful, for many chiefs of

the adverse party were slain in the field, and a pitched battle being fought between the parties, U'Thlambe's party was entirely defeated. U'Thlambe and one of U'Henza's brothers fell into the hands of the conquerors. U'Thlambe, after submitting to Gika, was set at liberty, because (as it is reported) Gika said "he had taught him to govern;" but the brother of U'Henza fell pierced through by Gika's own assagai. Some time after, on account of some obnoxious measures of Gika, a confederacy against him was formed by various chiefs, headed by U'Thlambe. This appeared so formidable that Gika was obliged to submit, and to renounce all controul over U'Thlambe or his people. A treaty was formed, in which each acknowledged the sovereignity of the other, and a boundary was fixed as the extent of each other's rule.

This peace between Gika and U'Thlambe did not last long, for on some of U'Thlambe's people seizing a crane which Gika's people had killed, (this bird is valuable to the Caffers on account of the long shoulder feathers which they wear on their heads when engaged in a war,) Gika made it a pretence to enter U'Thlambe's country and seize his cattle. This renewed the war, in which, though U'Henza himself did not appear, yet many of his chiefs went to the assistance of U'Thlambe,—Gika was defeated in a great battle, and brought nearly to the brink of ruin, when he met with a protector in the English, by whose interference U'Thlambe was compelled to relinquish what he had gained by his successes, and enter into treaty of amity with Gika. U'Thlambe by this treaty retained Sovereign rule over his people, but acknowledged the authority of Gika.

This is the last general war that has taken place amongst the Caffers.

The Chief U'Thlambe died 14th of February 1828, having lived to a great age; and on the 15th of November the following year (1829) Gika died, himself having hastened this event by the great intemperance of his latter years.

U'Thlambe retained the respect of his people to the last. He had been a great warrior, and though the situation of his country had for many years prevented him from exercising this talent, yet his former skill and bravery were the constant theme of the people, and the youth were instructed to respect and look up to him as one of their greatest Heroes, and his various deeds were pointed out to them as most worthy of imitation.

Gika, on the contrary, was never celebrated as a warrior, but was spoken of as very little skilled in the affairs of war, and as not possessing any great degree of personal courage even when the times required that it should be shown. His character was totally different from that of his father and grand-father, who were men of great enterprize and courage, desirous of the

aggrandizement of their country, and generally occupied in seeking it by finding constant occasions for war with the neighbouring nations. Gika took no delight in exertions of this kind, but manifested great aversion to war. His habits of life were indolent, and his disposition sluggish, but though this was the case he was a very inquisitive and keen observer of every thing that passed under his notice, and was a man of great ingenuity and cunning. He was a great orator, and prided himself upon this talent; he was quick in his perceptions, and lively in his speeches, at times keeping his auditors in constant laughter, and then again fixing their most serious attention. His policy as a chief was cautious and deliberative, but did not appear to reach beyond the present time. He was very rapacious but not tyrannical; though his exactions were frequent they were not rigid; and he exacted more to gratify those who were round him than to satisfy his own wants. He was neither loved nor feared by his people; their attachment was grounded on their regard to the memory of his father and his hereditary descent. His death was neither regretted nor lamented by the people.

The principal subordinate chieftians ruling the people forming the western part of the Caffer nation, which, from its vicinity to the Colony, is that which is most known, and of which I shall now more particularly notice, are U'Maaquomo, the eldest son of Gika and present Regent (a young child being the real heir for the reasons mentioned hereafter); Un Carle and Un Matwa, sons of Gika; Un Queno, grand-uncle to Gika; Un Phundis, a grand-son of Un Thlambe, Gika's uncle; and U'Botuman, a great grand-son of Um Dange; and the family of the Congos.

That part about the sources of the Keiskamma River is under Gika's son, U'Matwa. The sources of the Chumie River is the part that is governed by U'Carle. The lower part of that River is under the command of U'Macquomo, who is the Regent of the whole people lately under Gika. The course of the Keiskamma River below Fort Willshire is the country under the command of the chiefs U'Botuman and U'Queno. Below this, U'Dushonie's son, Un Phundis, has a small part along the boundary that is under his control, but the greater part is situated farther back in the rear of Un Queno's government. From this chieftain's boundary to the sea coast is the part that is under the command of the U'Congo family. This person has lately arrived at the dignity of Chief; his power originated in the accession of the Gonooka tribe of Hottentots. Un Phundis possesses a tract of land to the eastward, and situated along the Great Kai River. Un Tsusa and Un Nakwa, relations of Gika's, are chieftains of the country along the

mountains to the east of U'Matwa's people, and about the sources of the Buffalo River.

Their want of skill in computation, and their ignorance of the real number of people that are under the command of the different chiefs, make it very difficult to ascertain with correctness the amount of the population of their country; though the following calculation of the strength and numbers of those people may not therefore be quite correct, yet it is as near so as circumstances would permit it to be made, and will afford a pretty accurate knowledge of the strength of each chief. The whole population of the west part of Cafferland appears thus to amount to 150,000, men, women, and children. The male population is above 25,000, of whom about 16,000 only are warriors; but when any favorite expedition is engaged in, many others flock to the standard of their chiefs, and swell their ranks to a greater number.

The following is the estimated population of Cafferland:—

Under whose command.	Men.	Women and Children.	Total.
U'Gika's Sons and Uncles	6000	30,000	36,000
U'Botuman	2000	10,000	12,000
U'Queno	3000	15,000	18,000
U'Dushanie and Children	4000	20,000	24,000
Un Thlambe and Children	5000	25,000	30,000
Un Phundis	2000	10,000	12,000
Congo and Family	3000	15,000	18,000
Total	25,000	125,000	150,000

The amount of the military force of Cafferland is above 18,000, of which number any enterprising chief might bring 12,000 together, to support him in any measure that would meet with the universal approbation of the Caffer chiefs.

There are frequent skirmishes between the people of the different chieftains, most commonly arising from disputes between Herdsmen respecting water and pasturage, or acts of aggression on those who are not under their authority. The desertion of some wealthy individual from his own chief to another, is also a frequent cause of dispute, and these sometimes can only be decided by an appeal to arms. These skirmishes have lately seldom led to any serious war, for some of the neighbouring chiefs generally interfere, and a fine of cattle is received for the offence that has given rise to the dispute.

Though I have hitherto spoken of those people as a nation existing under the regular control of acknowledged rulers, yet we must bear in mind that the political union of all rude nations is so very incomplete, their civil regulations so few, and the authority to enforce those regulations so very feeble, that they

may in this state almost with propriety be deemed independent agents, rather than a people united together in the bonds of a regular society.

The chiefs are not so despotic, nor are they so tyrannical in the exercise of their power as has been long and generally supposed. It is considered quite proper to arm and resist his power, when the chief attempts to punish the people of any kraal; and many of these communities being united to each other by relationship or other ties, they fly to the assistance of the one in distress; so that, in perhaps eight cases out of ten, the chief's party is successfully repelled: in these circumstances a treaty is commenced, and a small fine generally satisfies the chief for this resistance to his authority; but even this is often refused. No affair of consequence can be entered into by the chief without the consent of his council, which is never given if they think the act will be contrary to established custom, or injurious to the nation at large; there is in fact no chief in Cafferland whose power approaches in any degree to despotism; they cannot act against long established usage; and the minor chiefs and people are very jealous of their rights, and are daily encroaching on those of their chiefs. At this time the power of every chief is so nugatory that no dependance can be placed upon any promise or treaty they may make. The people would laugh at it, and they would, if for their interest, break it immediately.

These observations are supported by the opinion of the Missionaries, who have long resided among them, and are thus capable of judging in their affairs with greater accuracy than any traveller or casual observer. One of them says, "Many of the actions and proceedings of the chiefs and great men of this country shock every feeling of humanity. Yet the power exercised by them in these acts does not flow so much from any absolute authority that the chiefs possess, as from *tyrant customs*. Most of the cruelties practised can plead the use and wont of the people, which are considered as law, or the rule by which the chiefs act." And again, "The actings of the chief are more frequently the carrying into execution the advice of these men (that is his council) than the gratification of his own desires." Another writes me, "However disposed a chief may be to enter into a treaty,—and however disposed he might be to keep inviolate his engagements, yet his own dependance on the tribe would totally incapacitate him from fulfilling it; for if not satisfied with his government, they would revolt, and be received with open arms by a rival chief."

The following brief account of the state of society in Cafferland will make this apparent, and show in some measure the state in which the Caffers exist as a nation:—

Kraal is the name given to their villages by the Europeans; these in general are formed by the members of one family, and by others united to that family in bonds of friendship or servitude, for there exists in Cafferland a state of vassalage.

This kraal is under the controul of a person who is generally the senior of the whole, and always the father of many who form this society; to him belong the greatest part of the flocks, which are pastured near it; to him they look for assistance and advice,—a sort of patriarchal authority exists in him, and according to the extent of his fame as a man of judgment and equity, so is his advice sought after and followed by similar and surrounding kraals, and he becomes a sort of natural councillor to a portion of the nation.

The brothers, sons, and nephews of the king, who have obtained a name from their experience or ability in the affairs of the nation, or their daring and bravery in the chace or war, also form kraals; and to these persons are attached a number of the more brave and ardent of the people. From the most experienced of these chiefs of kraals and divisions a council is formed, who esteem it as their right to advise and direct their king in affairs of national importance; and contrary to this advice no king has power to act. In conformity with the dictates of this assemblage of chiefs, the king leads to war, or negociates for peace. Their advice in favour of war is followed by an arming of the whole land. Their recommendation of peace re-calls the warriors to their respective homes, and the person of the sovereign is forsaken by all except his own immediate followers, who compose but a small part of the force of the nation, and are only members of a society similar to the others, but of which the king is chief.

The government of these individual societies is vested in their own chiefs, and they are entirely under his sway; he may be compared to the father of a large family, receiving submission and respect from them, and bestowing rewards or dispensing punishment as to him may seem proper. From his decision no appeal is made, and the advice of no other is sought, except as a matter of choice, when a case of more complicated nature comes under their notice. When the matter in dispute involves a question of the right of another chief, then it is considered as a national one, and the king and council take cognizance of it, and the punishment of the offender devolves on the king, to whom belongs the fine which is generally in these cases exacted from the offender.

It will appear by these observations that each chief is the ruler of a small independent state, subject however to this restraint, that he is under the jurisdiction of an assemblage of chiefs who are similarly situated as he is,—that a supremacy

vested in one person is acknowledged by these several chiefs, and that the right of possessing that supreme power is derived from hereditary descent. The right of succession to the supreme power depends upon the claimant being of royal descent both on the father's and mother's side.

The degree of relationship which exists between the chiefs of these people prevents them from intermarrying with the females of each other, as it is a custom with them not to marry with any that they suppose to be in any degree related to them; they, therefore, choose a consort from the royal family of the tribe of Tambookies, and the eldest male offspring of such alliance is the person entitled to the succession.

As polygamy exists among them the chiefs take several wives from among the common people, but the offspring of these wives never possess the sovereignty, though they raise themselves to great power, and often become the guardians of the kingly authority.

If the heir is a minor, he is taken under the care of one of the chiefs, who is appointed generally by a council of the chiefs to act as regent during the minority.

All the cattle, arms, and lands are considered as the property of the king; every person tacitly acknowledges that his flocks, wives, and every thing he possesses is derived from his sovereign; and when the cattle are seized for any real or alleged offence, it is said he was not worthy to be trusted with the king's property, and that therefore he has only taken his own to bestow it on some more worthy person. The subordinate chiefs, in like manner, claim the property of all those who are under their controul, and when they levy a fine it is in the king's name and for his use, and they always send a portion of it to him.

There is no stated revenue for the support of the royal dignity: the wealth of the king arises from his own private patrimony, for though he claims all the property of the people, and they acknowledge the justness of the claim, yet they never voluntarily give up any thing, nor can he deprive them of it without a pretence be offered, or be framed for that purpose. Fines for the offences of his subjects, real or alleged, form one method of increasing his wealth; another is, a share of the plunder acquired in a successful incursion, but if the act be resented and restitution demanded, and the king is not willing to sanction and defend the aggression, restitution is made out of the property of the offender, and the remainder is retained by the king. Also when any man dies, all the cattle that he had in possession are taken by the chief to whom he belonged, and in this case part of them is sent to the royal kraal. Part also of the price obtained for their cattle or for game is claimed

by the king. By these and similar methods the kraals of the king are kept well stocked, and he is enabled to bestow gifts upon those he may wish to conciliate or reward, or by whose services he has been benefitted. The inferior chiefs use the same means to increase their wealth, but in these cases the king is presented with a part of the acquired stock.

Laws are unknown, the chiefs rendering judgment according to their will, founded, however, upon custom. Most crimes are compensated by a fine of cattle: the thief by this custom is compelled to restore ten-fold to the person he has robbed. The crime is only to be proved before and to the satisfaction of the chief, when the execution of justice is committed to the party aggrieved, which instantly follows conviction. The chief himself has no power to lessen the mulct; he may, however, and generally does intercede for the culprit; if successful, he claims a reward for this intercession.

The more heinous crimes, such as adultery and murder, are in like manner proved before the chief, and may be compensated, but the party aggrieved fixes the price; and also in this case the chief stands between the parties as an intercessor. In cases of murder, if the aggrieved person or any other should slay the offender, he is subject to no fine.

Women are entirely in the power of the men to whom they belong, and may even be put to death with impunity for any crime committed by them.

They are firm believers in witchcraft, and the punishment of the wretch who is accused and found guilty of this offence is extreme torture, or even death, and the whole community anxiously assist in the execution of the sentence. Persons accused of crimes are generally present when the accusation is made, and are permitted to defend themselves against the charge, and they also receive the assistance of others to effect this; they discover great skill and ingenuity in the examination and cross-examination of witnesses.

This is not the case, however, when a charge of witchcraft, or of an offence against the person of the king, is preferred. This is made before a select council, and often the accused is only apprised of it by those who are sent to execute the sentence; which not unfrequently is death, or he is dragged away to a torture that is worse, and generally terminates fatally—in both cases the whole of the cattle of the accused offender is forfeited to the King.

(*To be continued.*)

A Notice of the Progress of the Expedition lately sent out from Liverpool to trade in the Niger. Extracted from a private Letter, dated 18th June 1833.

[Read at the South African Institution.]

The two steamers destined for the Niger, in company with a brig carrying the provisions and merchandise, touched on their way out, first at Sierra Leone, and then at York, one of the villages attached to that colony, where they wooded and watered. Shortly after leaving the latter place some of the crew fell sick and died, and by the time the vessels reached Cape Coast disease had begun to make such ravages amongst both officers and men that discontent, approaching to mutiny, was actually excited. After leaving Cape Coast they proceeded to Acra, there remained a few days and then moved on to Cape Formosa, where they again wooded and watered.

Whilst so employed fresh sickness was contracted, in consequence of the great exposure of both officers and men to sun and rain, the latter of which was very abundant, it having been the rainy season. With the exception of Mr. Lander, not one either of the officers or men had ever been on the coast before, and were consequently not acquainted with the necessity of employing *Kroomen* to perform work which demanded such exposure, and which could only be completed with impunity by them. This it is understood was an express arrangement made by the owners, under an impression that trade would thrive better in the hands of strangers or novices than in those of persons who were acquainted with the secret.

The vessels arrived at the river *Nun* in the beginning of October, where, after a week's sickness, the master of the iron steam boat died, and also several of the men. The brig was left at the entrance of the river from there not being sufficient water to enable her to proceed farther, and the two steam boats only ascended. Prior to their starting a dispute arose as to who should be the director, and which was eventually decided by it being discovered that the management of the Expedition, after entering the river was to devolve on the son of one of the principal owners. Thus Lander was deprived of a controul which he did not expect should happen before his arrival at Fundah, or some other place from whence he was to return to England. This, with many other occurrences on board, is understood to have excited much bad feeling amongst the officers.

Lander nevertheless continued to distribute presents and carry on trade with the natives, who seemed to understand him better than they did the others. In their progress up the river

they reached the town of the chief who had formerly bought him and his brother out of slavery, and who had received but a very small recompense for so good an action. There he went on shore, and was greeted by the old chief, who was delighted with the different presents he brought for him, and which were purchased with a hundred pounds which had been assigned by Government for that purpose. Amongst the articles were a general's full uniform, twenty suits of regimentals, twenty muskets, and a quantity of ball cartridge. The chief immediately dressed himself and caused some of his head men to do the same, after which he paraded them before Lander, and made them fire three salutes.

Here they remained only a short time, and then proceeded further up the river, which in some parts was so shallow that the steam boats stirred up the mud at a depth of six feet. After having wooded and watered afresh, they advanced towards the town of a very considerable king or chief, who had received information of their intended visit from the Bonney people who keep up a constant communication with the towns on the river, and supply them with ivory and palm oil. These people brought presents with them for that chief, in hopes of inducing him to oppose the progress of the vessel which they considered encroaching upon their trade. This sort of bribery appears to have originated with some ——— merchants, who, it is understood, have instructed the masters of their vessels, trading with the Bonneys, to throw every obstacle in the way of the expedition, and to give presents to the different chiefs to encourage their opposition to it.

As soon as the vessels had arrived within a day's sail of the town, the chief sent down a great number of canoes, and in one of them a messenger with information, that if they proceeded farther the king would make "war palaver." Lander returned for answer that they had come to trade, and not to make war; that he did not fear the king, yet nevertheless wished friendship and not enmity to exist. He sent him also some presents, and according to the custom of the country, two rings which he was to place on the fourth finger of the right hand, if he was inclined for peace, but if for war they were to be returned, when he would make "war palaver—white man's war palaver." The messenger with the canoes returned armed to the town, upon which all the head men were called together to decide whether there should be war or peace. The accomplishment of that required two days; and was in favor of peace, as was declared by the king placing the rings upon his fourth finger, and dispatching several chiefs with 4 cwt. of ivory, and a request to see Lander. The vessels were now moved up in front of the town, and he went on shore with additional presents.

He was received by a guard of about three hundred men, almost all armed with muskets, and some dressed like British soldiers. After arranging matters and establishing themselves upon an amicable footing, they transacted a good deal of business; acquired a few tons of ivory and some skins of tigers, lions, leopards, &c.: the ivory was bought at the rate of 4*d.* per pound.

They did not remain here long, but proceeded higher up, and in their way passed several small villages and towns, some of the inhabitants of which annoyed them so much by their firing that they were necessitated to burn many of them. They had been up the river four or five months*, during which period many had died and almost all had been sick, amongst them the surgeon, whose duty Lander performed as long as he was able. A dysentery attack, however, soon deprived all of what assistance he had been able to afford, and in consequence of the utter want of proper attendance all were reduced to a most wretched condition.

Lander became at last so unwell that he made up his mind to return down the river to the brig, and try what could be done. This he accomplished with the greatest difficulty and at great risk, having passed fourteen days and nights in a canoe, descending by means of a rapid current at the rate of ten miles an hour. After he arrived at the brig he found himself to be so much worse that he determined upon going to Fernando Po to recruit. That he reached about the 27th of April without tornadoes or rain, which was a fortunate circumstance, as had he been exposed to either he must have perished, being in an open boat.

Every proper attention was paid him on his arrival, and I am happy to say that when I left he appeared rallying fast. Since that I have received a letter, informing me that Captain Trotter was about to take him over to the *Nun* again, to join the expedition. He told me he would take 30 days at least to reach the steamer, as there would be a strong current to contend with.

He seemed to think the expedition would answer, with a few alterations; he considered that *Kroomen* should be employed in the boat work, such as wooding and watering, which seemed to constitute the chief of their work. It is understood he is to have one-fifth of the profits of the voyage. But he does not expect to return to the coast again, although the company should still continue to send out vessels, there being no provision whatever for his family in the event of his death. The government have held out employment to him on his return to England, which he intends to accept in preference to venturing again on this coast.

* Probably when Lander left them to return to the brig.—*Eds.*

AN EPITOME OF AFRICAN ZOOLOGY;

OR,

A CONCISE DESCRIPTION OF THE OBJECTS

OF

THE ANIMAL KINGDOM INHABITING AFRICA, ITS ISLANDS AND SEAS:

By A. SMITH, M.D. M.W.S. &c.

At the Ordinary Monthly Meeting of the Council of the South African Literary and Scientific Institution, on Wednesday, 7th August 1833, it was resolved,—"That, in order to promote the study of Natural History in this country, and an acquaintance generally with its productions, Dr. Smith be requested to draw up an Epitome of the Zoology of Africa from his personal Observations and Researches, or from such other sources of Information as may here be available for that purpose."

The want of something like that suggested in the Resolution just quoted has long been experienced, and nothing but the absence of proper means for such a purpose has hitherto prevented me from attempting to furnish it. Much information is doubtless to be obtained from the various systematic works on Zoology, but in them it is so mixed and scattered that but few individuals here would have either patience or leisure to search out that which actually belongs to this quarter.

Under such circumstances the only step that could be resorted to with a prospect of remedying or rather lessening the existing evil, is that which has been recommended, namely—the bringing together into a small and connected form all that is within our reach, under a hope that those enjoying more extensive opportunities will be inclined to supply the deficiencies. This I have endeavoured to accomplish, and though the compilation will not furnish a complete list and description of the objects of the animal kingdom which inhabit Africa, yet it will go farther towards that than any single work yet produced. The details which relate to South Africa will be found tolerably complete, having been supplied from personal observation, whilst those which refer to other parts will be found more deficient, having been collected from limited and inefficient sources of information.

Naturalists indicate the number of teeth in the jaws of the mammiferous animals by figures placed in a particular position, thus: incisors or cutting teeth $\frac{4}{4}$ means four in the upper jaw and four in the lower. — Where teeth of the same character occur in both sides of the same jaw, the number is indicated by a double set of figures, thus: canines or dog teeth $\frac{1}{1}\,\frac{1}{1}$ implies one on each side of the upper jaw and the same in the lower; molars or grinders $\frac{5}{5}\,\frac{5}{5}$ means five in each side of the upper and five in each side of the lower jaw.

FAM. SIMIADÆ.

Form approaching more or less to that of man; four inclined incisors in each jaw; nose more or less prominent; nostrils more or less separated from each other; two pectoral mammæ; orbital and temporal fossæ distinct; nails of the fingers flat.

Genus TROGLODYTES. *Geoff.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}\,\frac{1}{1}$, *molars* $\frac{5}{5}\,\frac{5}{5}$—32. *Canines little projecting, contiguous to the incisors and molars, as those of man; head rounded; muzzle little projecting; superciliary ridge prominent; fascial angle* 50°; *arms almost proportioned to the legs, reaching to the hip joints; thumbs long; no tail, cheek pouches, intermaxillary bones, nor callosities on the buttocks.*

Troglodytes niger. **Desm.** (Chimpanse.) Body covered with long black and thinly scattered hair, that on the shoulders

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AFRICAN ZOOLOGY.

PART I.

MAMMALIA.

ORDER QUADRUMANA.

THREE kinds of teeth—incisors, canines, and molars; four extremities terminated by hands, with the thumb separate from the other fingers, and more or less opposable to them; fingers long and flexible; two or four pectoral mammæ; clavicles complete; bones of the arms and legs distinct, and susceptible of the motions of pronation and supination; male organs of generation external; stomach membraneous simple; intestines of medium length, with a small cæcum; orbital and temporal fossæ distinct.

FAM. SIMIADÆ.

Form approaching more or less to that of man; four inclined incisors in each jaw; nose more or less prominent; nostrils more or less separated from each other; two pectoral mammæ; orbital and temporal fossæ distinct; nails of the fingers flat.

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Troglodytes niger. Desm. (Chimpanse.) Body covered with long black and thinly scattered hair, that on the shoulders

longer than elsewhere; hair on the forearm, directed towards the elbow; face naked and of a brown colour, with the exception of the cheeks, which are beset with hair similar to that of the body; belly almost naked. About three feet in length.

Inhabits Guinea and Congo; lives in troops, constructs huts of leaves and branches of trees, arms itself with stones and clubs, pursues and carries off negro women, and is very intelligent, and susceptible of considerable education.

Simia troglodytes, Lin. 12. 1. Pongo, Buff. *Supp.* 7. Simia pygmea, Schreb. *fig.* 1, B. Simia satyrus, Schreb. *fig.* 2. Pongo, Aud. *fam.* 1, §. 1, *fig.* 1. Mimetis, Leach. *Jour Phys.*

Genus Colobus. *Illiger.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$—32. *Muzzle short; body and extremities slender; fingers very long; anterior extremities without thumbs; tail long, slender, and tufted towards its extremity; cheek pouches, and callosities on the buttocks.*

Colobus Polycomus. Geoff. (Full-bottom Monkey.) Face naked and black; head and neck covered with long, coarse, flowing hair of a dirty yellowish colour mixed with black; body and extremities glossy black; tail white. Length between three and four feet.

Inhabits the woods of Sierra Leone and Guinea.——South Africa. *Bennet.*

Simia Polycomus, Schreb. *fig.* 10. D. Guenon a camail, Buff. *Supp.* 7. *fig.* 17. Simia Polycomus, Bodd. Full-bottom Monkey, Penn. *Quad. fig.* 46. Simia Comosa, Shaw. 1. *fig.* 24.

Colobus ferruginosus. Geoff. (Bay monkey.) Crown of the head black; back a deep bright bay; outsides of the limbs and the tail, black; cheeks, under part of the body, and legs light bay.

Inhabits Sierra Leone.——South Africa. *Bennet.*

Simia ferruginea, Shaw, *p.* 56. Autre guenon, Buff. *Supp.* 7. *p.* 66. Bay Monkey, Penn. *Quad.* 203.

Genus Lasiopyga. *Illiger.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$—32. *Fascial angle* 45°, *head round; muzzle slightly prolonged; hands very long; thumbs of the anterior hands very short and slender; tail long; cheek pouches distinct; buttocks not callous, fringed with hair.*

Lasiopyga nemæus, Illiger. (Douc.) Face short and rather flat, furnished on each side with long hairs of a pale yellow

colour; body beautifully variegated with different coloured hair; neck with a bluish purple collar; top of head and body grey; breast and belly yellow; arms white below and black above; tail white; hands black; face and ears red; lips black, and round each eye there is a black ring. When standing erect this species measures nearly four feet.

Inhabits Cochin China and Madagascar, and by the inhabitants of the latter is called Sifac.

Simia nemæa Gm. *Sys. Nat.* 34. Pygathrix nemæus. Geoff. *Ann. Mus.* xix. 90. Le Douc, Buff. xiv. 298. Cochin China Monkey, Pen. *Quad.* 211. Shaw, *vol.* 1. *p.* 56.

Genus Semnopithecus. *F. Cuvier.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{5}{5}$ $\frac{5}{5}$,—32. *Fascial angle* 45°; *head round; nose flat; ears moderate; limbs very long; thumbs of anterior hands very short and remote; cheek pouches and callosities on the buttocks; tail very long and thin.*

Semnopithecus Albogularis, Sykes. Head rounded and short; ears very small, nearly rounded, and for the most part concealed in the long hair about the head; eyes deep seated, of a brown ochre colour, and shaded by a continuous arch of long hairs directed forwards; hair forming a bunch on each cheek and resembling whiskers; no beard. The whole of the upper surface of the animal of a mingled black and yellowish ochre colour, each hair being banded black and ochre; the black prevailing on the shoulders, the ochre on the back and flanks; under surface grizzled white and black; anterior limbs uniform black; posterior black with a little of the dorsal colour; chin and throat pure white; tail black, half as long as the body; cheek pouches rudimentary; thumbs of anterior hands short and distinct, those of the posterior long.

Inhabits Madagascar.

Obs. Col. Sykes who described this animal, said, It was obtained at Bombay, where it was believed to have been taken from Madagascar; and as it had some characters in common with the *Cercopitheci* (especially with the group of which the *Cerc. Sabæus* forms a part) and the *Semnopitheci* of India, he remarked that it might ultimately prove to be a connecting link between the African and Asiatic monkeys. It wants the long limbs of the *Semnopitheci;* and although its tail is very long, it is not particularly thin. Col. Sykes referred it provisionally to the *Semnopitheci,* until by an examination of its posterior molars its real station in the sytsem should be determined.

Genus Cercopithecus. *Geoff.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$,—32. *Fascial angle 50°; head round; forehead tapering behind; no superciliary ridges; edges of the orbits smooth; nose flat; nostrils open to the nasal fossæ; ears moderate; cheek pouches and callosities on the buttocks; tail longer than the body.*

Cercopithecus Talapoin. Geoff. (Talapoin Monkey). Face dusky black; ears large, round, and black; hair on the sides of the face very long and directed backwards towards the ears; on the chin a small beard; colour of the upper parts olivaceous with a blackish cast on the outsides of the limbs; under parts of the body and inside of the limbs whitish yellow; tail olivaceous above, ash coloured beneath; hands black. Length of body about a foot, length of tail nearly a foot and a half.

Inhabits Africa.——Guinea, *Buffon.*

Simia talapoin, Lin. Gm. Talapoin, Buff. 14. *fig.* 40. Simia talapoin, Schreb *fig.* 17. Talapoin Monkey, Penn. *Quad.* 206.

Cercopithecus cephus. Geoff. (Mustache Monkey). Nose short and of a dirty bluish colour; beneath it a transverse white stripe; edges of both lips and space round eyes black; on each cheek, before the ear, a large tuft of yellow hair; ears round and tufted with whitish hairs. On the top of the head the hair is long and upright; round the mouth there are some black hairs; colour of the head yellow variegated with black; body, limbs, and part of tail, a mixture of red and ash colours, the rest of the tail yellowish; hands black. Length of body seldom more than a foot, tail about eighteen inches.

Inhabits Guinea.

Simia cephus, Lin. *Sys. Nat. p.* 39. Moustac, Buff. 14, *p.* 283. *pl.* 39.

The Mustache, Pen. *Quad. p.* 205. Simia cephus, Schreb. *fig.* 19. Simia mona, Screb, *fig.* 15.

Cercopithecus nictitans. Geoff. (White-nosed Monkey). Face flat and black; nose pure white; eyes yellow; head, back, and sides, black, sprinkled with greenish grey; belly white; hands black; tail very long, black above and white beneath.

Inhabits Guinea and Angola.

Simia nictitans, Lin. 12. 1. Schreb. *fig.* 19 A. Guenon a long nez proéminent. All. et Buff. *Supp.* 7, *fig.* 18. Hocheur. Aud. *fam.* 4, *sect.* 1. *fig.* 2. White Nose Monkey, Pen. *Quad.* 205.

Cercopithecus petaurista. Geoff. (Vaulting Monkey). Face black, with a snow white triangular spot on the nose; dark olivaceous or reddish above, white beneath; underpart of the tail and insides of the limbs blackish grey. Length of the body somewhat more than a foot; tail about twenty inches.—In Allamand's figure of this monkey the chin appears surrounded by a white beard, and there is a reversed tuft of yellow hair beneath each ear.

Inhabits Guinea.

Simia petaurista, Lin. Gm. *p.* 35. Blanc nez Allam. Buff. 14. *p.* 141. *pl.* 39. Guenon a nez blanc proéminent, Buff. *Supp.* 7. *p.* 72. *pl.* 18. Vaulting Monkey, Shaw, *Zool. vol.* 1. *part* 1. *p.* 51.

Cercopithecus ruber. Geoff. (Red Monkey). Nose long; eyes sunk in the head; ears furnished with pretty long hairs; the hair on each side of the face long; the chin bearded; body slender; over each eye, from ear to ear, extends a black line; the upper parts of the body of a most beautiful bright bay, almost red; the lower parts ash coloured, tinged with yellow; the tail not so long as the body, the whole length of which is about one foot six inches. *Pennant.*

A variety of this species is described with a white line over the eyes; it has also the long hair under the chin and round the cheeks, only white, instead of yellow.

Inhabits Guinea—Central Africa. *Denham.*

Simia rubra, Lin. *Sys. Nat.* Gmel. *p.* 34. Le Patas. Buff. 14. *fig.* 25 & 26. Simia patas, Schreb. *fig.* 16. Simia rufa, Schreb. *fig.* 16. B. Red Monkey, Pen. *Quad. p.* 208. Shaw, *vol.* 1. *part* 1. *p.* 49.

Cercopithecus diana. Geoff. (Palatine Monkey). Black spotted with white, hinder part of the back ferruginous; face black; from the top of the nose a white line, passes over each eye to the ears in an arched direction; beard pointed, black above, white beneath, and placed on a kind of fatty tumor; breast and throat white: from the rump across the thighs a white line: tail long, straight, and black; ears and feet the same colour. Size of a large cat. *Linnæus.*

Upper parts reddish marked with white specks; belly and chin whitish; tail very long. *Pennant.*

Inhabits Guinea and Congo.——South Africa. *Bennet.*

Simia Diana, Lin. *Sys. Nat. p.* 38. Spotted Monkey, Pen. *Quad. p.* 201. Simia Diana, Schreb. *fig.* 14. Simia rolovai, Schreb. *fig.* 25. Diane, Aud. *fam.* 4. *sect.* 2. *fig.* 6.

Cercopithecus Mona, Geoff. (Varied Monkey.) Nose, mouth, and spaces round eyes, dull flesh colour; cheeks bounded by long whitish yellow hairs; forehead grey; and over the eyes, from ear to ear, extends a black line; the upper part of the body dusky tawny, or chesnut coloured; the breast, belly, and insides of the extremities, white; the outsides of the latter black; hands naked and black; tail cinereous brown, and close to its base on each buttock a white spot. Length of head and body nearly eighteen inches, length of tail about two feet.

Inhabits Barbary, Ethiopia, and other parts of Africa. *Shaw.*

Simia Mona, Gm. Lin. Mone, Buff. 14. *fig.* 36. et *Supp.* 7. *fig.* 19. Simia Mona, Schreb. *fig.* 15. *deuxieme No.* Mone, Aud. *fam.* 4, *sect.* 2, *fig.* 7. The varied Monkey, Penn. *Quad.* 219. Shaw's *Zool.* 1. 54.

Genus Cercocebus. Geoff.

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$—32. *Fascial angle* 45°; *head triangular*; *muzzle longish*; *the upper orbital edge rising again and cut internally*; *nose flat and convex*; *thumbs of the anterior hands thin, rather close to the fingers, those of the hinder larger and more distinct*; *buttocks with very large callosities*; *tail longer than the body*; *cheek pouches distinct.*

Cercocebus sabæus. Geoff. (Green Monkey). Colour above, olive slightly varied with grey, beneath silvery grey; face dusky reddish, or a swarthy flesh colour; nose black; cheeks covered with long pale yellow hair, falling back on each side of the face, and almost covering the ears which are black; scrotum copper green surrounded by yellow hairs; tail long, slender, and yellow at the tip. About the size of a small cat.

Inhabits Congo, Senegal, and Mauritania.

Simia Sabæa, Lin. *Sys. Nat.* 1. 38. Cercopithecus sabæus, Geoff. *Ann. Mus.* xix. Singe vert, Bris. *Reg. An.* 205. Calletriche, Buff. xiv. 272. Green Monkey, Pen. *Quad.* 203.

Cercocebus griseo-viridis. (Grivet.) Fur greenish grey; scrotum copper green, surrounded with white hairs; head pyramidical; tail entirely grey.

Inhabits Africa.

Cercopithecus griseo-viridis, F. Cuvier. Le Grivet, F. Cuvier. *Mam.*

Cercocebus pygerythræus. (Red-vented Monkey.) Above greenish grey, beneath white; face, hands, and tip of tail, black; scrotum greyish green, margined with white hairs; vent surrounded by a deep red ring; eyebrows dusky white.

Length of head and body about eighteen inches; tail nearly the same.

Inhabits South Africa, and troops consisting of twenty or thirty individuals, are often seen in woods and thickets, at no great distance from Cape Town.

Cercopithecus pygerythræus, F. Cuvier. *Mam.*

Cercocebus aygula, Geoff. (Egret Monkey.) Fur olive brown above, grey beneath; forehead blackish; an upright and pointed tuft of hair upon the top of the head; face flesh coloured, upper edge of the orbit elevated. Size of a small cat.

Inhabits Mauritius. *Desjardins.*

Simia Aygula, Lin. *Syst. Nat. p.* 39. Aigrette, Buff. 14. *fig.* 21. Simia Aygula, Schreb. *fig.* 22. Egret Monkey, Pen. *Quad. p.* 207.

Cercocebus fuliginosus. Geoff. (White-faced Monkey.) Colour smokey brown, without any spots on the head or neck; upper eyelids pure white. Size nearly that of the domestic cat.

Inhabits Ethiopia.

Simia Œthiops, Lin. Gm. *Sys. Nat.* 33. White-eyed Monkey, Penn. *Quad.* 204. Shaw, 43. Mangabey, Buff. xiv. *t.* 344. Simia Œthiops, Schreb. *fig.* 20.

Cercocebus Œthiops. Geoff. (Collared Mangabey.) Fur wine brown; top of the head red; upper eyelids white, and a white band separates the eyes and proceeds on each side to the top of the neck. About a foot and a half high.

Inhabits Ethiopia.

Simia Œthiops, Var. Gmel. Mangabey a Collier blanc, Buff. xiv. Icon. Buff. xiv. *t.* 33. Var. 11. Audeb. *Hist.* 4. §. 2. *f.* 10. Schreb. *t.* 21.

Genus Macacus. *Lacepede.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{5}{5}$ $\frac{5}{5}$,—32. *Canine teeth very strong in the males; the first and second molars with two tubercles on their crown; the three others have four, with the exception of the last of the lower jaw which has five, and which is terminated by a heel; fascial angle* 40° *or* 45°; *superciliary ridges much developed; muzzle broad and projecting; eyes approaching; nostrils oblique; ears naked, close to the head, angular; cheek pouches; lips thin and extensible; callosities on the buttocks; tail shortish.*

Macacus cynomolgus. Desm. (Hare-lipped Monkey.) Greenish brown or olive above; greyish white below; head large; eyes small; body thick and clumsy; tail rather shorter than

the body; nostrils divided. Length of the body and head about eighteen or twenty inches.

Inhabits Guinea and the interior of Africa.

Simia cynomolgus, Lin. *Sys. Nat.* 1. 38. Simia cynocephalus Lin. *Sys. Nat.* 1. 38. Cercocebus cynomolgus and C. cynocephalus. Geoff. *Ann. Mus.* xix. 99. Hare-lipped Monkey, Pennant, *Quad.* 200. Macaque, Buff. xiv. 190. Macaque ordinaire, Desm. *sp.* 34.

Genus Pithecus. *Gray.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{5}{5}$ $\frac{5}{5}$,—32. *Fascial angle* 40° 45°; *superciliary and occipital ridges very distinct; tail very short or only a small tubercle; cheek pouches and callosities distinct; ears angular.*

Pithecus inuus. (Pigmy, or Barbary Ape.) Above greenish grey, beneath paler or whitish; a cutaneous appendage in place of a tail. Grows to the height of about four feet.

Inhabits Barbary, Egypt, and the rock of Gibraltar.

Simia inuus, Lin. *Sys. Nat.* 35. Simia silvanus, Lin. *Sys. Nat.* 1. 34. (*Junior.*) Simia Pithecus, Schreb. *fig.* 4. B. Macacus indicus, Desm. *Mam.* 67. Pitheque, Buff. *Supp.* vii. Barbary Ape, Pennant, *Quad.* 186. Pigmy Ape, Pen. *Quad.* 183. Alpinus Ape, Shaw, *Zool.* 1. 14. Magot or Barbary Ape, Griff. *Quad.*

Genus Cynocephalus. *Brisson.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{5}{5}$ $\frac{5}{5}$,—32. *Canine teeth very strong; last molar of the under jaw with a heel; muzzle long and truncated at the end; fascial angle* 30° 35°; *superciliary, sagittal and occipital ridges prominent; cheek pouches; large callosities; tail as long or longer than the body.*

Cynocephalus Babouin. Desm. (Little Baboon.) Fur greenish yellow; face a livid flesh colour; cartilage of the nose not exceeded by the bones of the upper jaw. Length nearly eighteen inches; tail about six inches.

Inhabits Northern Africa.

Simia cynocephalus, Lin. *Sys. Nat.* 38. Papio cynocephalus, Geoff. *Ann. Mus.* xix. 102. Cynocephalus, Pliny. Petit. papion, Buff. 14. 69. Baboin, F. Cuvier, *Mam.*

Cynocephalus papio, Desm. (Guinea Baboon.) Fur yellowish brown; face entirely black; cartilage of the nose exceeding the jaws: upper eyelids white.

Inhabits the Coast of Guinea.

Simia cynocephalus, Brongn. *Hist. Nat.* Cynocephalus Papio, Desm. *Mam.* 69. Papion, Buff. xiv. Audeb. 3. §. 1. *fig.* 1.

Cynocephalus porcarius. (Pig-faced Baboon.) Face black; hair long and shaggy, more especially upon the back of the neck and shoulders. The colour varies in different individuals: in some it is a greenish black, verging to black upon the head, neck, tail, and hands; in others, particularly aged ones, it is almost black on the head, neck, forearms and hands, and dirty reddish or tawny brown on the other parts of the body. Length of body about three feet; tail eighteen inches.

Inhabits South African, and resorts to mountains and rocky glens.

Simia Porcaria, Lin. Gmel. *Syst. Nat.* Simia sphingiola, Herman.? Papio comatus et P. porcarius, Geoff. *Ann. Mus.* xix. 102 & 103. Guenon a face alongée, Buff. Singe Noir, Le Vaillant. Chacma, F. Cuvier. *Mam.* Papion noir, Cuv. *Reg. An.* 110. Baboon or Bavian of the Colonist.

Cynocephalus hamadryas. Geoff. (Dog-faced Baboon.) Fur ash coloured; beard and mane very long; face bare and flesh coloured; eyes deep seated, and of a chesnut colour; hands black; tail not quite so long as the body, and sometimes a little tufted at the extremity. When standing erect measures between four and five feet.

Inhabits Abysinia. *Ehrenberg.*

Simia hamadryas, Lin. *Syst. Nat.* 36. Babouin a museau de chien, Buff. *Supp.* vii. Singe de Mocco, Buff. xix. Papion a Perruque, Cuv. *Reg. Animal.* Dog-faced Ape, Penn. *Quad.* 194. Dog-faced Baboon, Shaw, *Zool.* 1. 28.

Genus Papio. *Brisson.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{5}{5}$ $\frac{5}{5}$,—32. *Fascial angle* 30°. 35°; *superciliary and occipital ridges very prominent; muzzle very long and truncated at the end; canine teeth strong; cheek pouches and callosities very distinct; tail very short, and perpendicular to the dorsal spine.*

Papio Mormon. (The Mandril.) Face naked and of a purple colour; muzzle furrowed on each side with deep wrinkles; hair olive brown above, whitish beneath; beard yellow; nose red in adult males. When standing erect measures from three to five feet.

Inhabits Africa on the Gold and Guinea Coasts.

Simia Sphinx, Lin. *Syst. Nat.* 35. Simia Mormon, Gmel. *Syst. Nat.* Papio sus, Baboon, Gesner, *Quad.* 252. Choras,

Buff. *Supp.* vii. Mandril, G. Cuvier, *Menag. Mus.* Great Baboon, Pen. *Quad.* 188. Variegated Baboon, Shaw, *Zool.* 1. 17. (*Junior.*) Simia Marmon, Lin. *Syst. Nat.* 35. Le Mandril, Buff. xvi. Marmon, Shaw, *Zool.* 1. 20. Ribbed-nosed Baboon, Penn. *Quad.* 190.

Papio leucophæus. (The Dril.) Fur greyish brown, inclined to greenish above, white beneath; face in both sexes, and at all ages, an uniform deep black. About three feet in length.

Inhabits Africa.

Simia leucophæa, F. Cuvier, *Ann. Mus.* xix. Cynocephalus leucophæus, Desm. *Mam.* 71. Dril. F. Cuv. *Mam.* Wood Baboon, Griff. *Quad. t.* 20?

Papio sylvicola (Wood Baboon.) Fur ferruginous brown, with a freckled appearance from each hair being ringed alternately with black and ferruginous; face and hands black. This species is of a robust form, and is in height about three feet; the tail is nearly three inches in length.

Inhabits Guinea.

Simia Sylvicola, *Mus. Lever.* 201. Le Babouin des Bois, Buff. *Supp.* vii. 39. Wood Baboon, Penn. *Quad.* 191.

Papio sublutea. (Yellow Baboon.) Fur yellow, freckled with black; face naked and black; over the eyes some long dusky hairs; hands above hairy. Length about two feet.

Inhabits Africa.

Simia sublutea, Shaw. *Zool.* 1. 23. Yellow Baboon, Penn. *Quad.* 191.

Papio cinerea. (Cinereous Baboon.) Face dusky; beard thick, bushy, and of a pale brown colour; body and limbs cinereous brown; crown mottled with yellow. Length about two feet.

Inhabits Africa.

Obs. Some writers are inclined to consider the three last described as only varieties of the Papio leucophæus.

Fam. LEMURIDÆ.

General form approaching that of quadrupeds properly so called; incisors varying in number, form, and situation; nostrils at the extremity of the muzzle; posterior extremities longer than the anterior; index finger of hinder hands with a long and sharpish nail; mammæ pectoral or inguinal, two or four; ears short; tail mostly long; fur woolly.

Genus Lichanotus. *Illiger.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$,—32. *Superior incisors in pairs; inferior ones inclined, the outermost of each side broadest; molars with a tubeculous crown; two pectoral mammæ; lower jaw shorter than the upper; tail very short or none.*

Lichanotus niger. (Black Indri.) Black with a greyish tinge towards the lower part of the belly; rump white, or pale tawny; face greyish, and of a lengthened or dog-like form; fur silky, dense, and in some places curled; tail very short. Height three feet and a half. *Sonnerat.*

Inhabits Madagascar.

Lemur Indri, Gmel. *Syst. Nat.* 42. Indris brevicaudatus, Geoff. *Ann. du Mus.* xix. 157. Lichanotus Indri, Illig. *Prod.* 72 Indri, Sonnini, *Voy.* 142. Indri Macauco, Penn. *Quad.* 1. 228. Lemur Indri, Shaw, *Zool. vol.* 1. *part* 1. *p.* 94. *fig.* 32.

Genus Indris. *Lacepede.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$—30. *Upper jaw,—Incisors very small, placed in pairs much a part; canines short, triangular and pointed; first and second molars with three acute tubercles nearly in a line, second and third with four tubercles, the two on the outer sides subdivided, the two on the inner entire and blunt, last with three tubercles, one on each side, and the third behind in the form of a transverse ridge. Under jaw,—Incisors nearly horizontal, slightly curved, and the outermost on each side largest; canines lying forwards, obtusely pointed and scarcely projecting beyond the molars; first molar with three tubercles, second, third, and last, with four or five. Head rounded; face short and covered with fur; muzzle bare; tail as long as the body; posterior extremites much longer than the anterior ones; nail of index finger of hinder hands long and rather slender.*

Indris laniger. (Flocky Lemur.) Colour above a reddish or tawny grey, slightly freckled by the tips of many of the hairs, particularly those of the upper part of the head, being silvery white; rump and vent tawny white; under part of neck, breast, belly, and insides of anterior extremities, pale ashy black, or greyish white tinted with reddish brown; hands, face, and sides of head, more or less ferruginous; insides of hinder extremities, toward body, pure white; tail deep ferruginous; extremity of muzzle and anterior portion of upper jaw black; near angle of lower jaw, on each side, a small somewhat circular white spot; thumbs and fingers black. Length of head, two inches, of body ten and a half; tail ten inches and a half.

Inhabits Madagascar.

Lemur laniger, Lin. Gm. *Syst. Nat.* 1. 44. Indris longicaudatus, Geoff. *Ann. Mus.* xix. 158. Lichanotus laniger,

Illiger, *Prod.* 72. Maki a bourré, Sonn. *Voy.* ii. *t.* 89. Le Maki a bours, Buff. *Supp.* 7. *p.* 48. Lemur laniger, Shaw. *Zool. vol.* 1. *p.* 1. *p.* 99. *fig.* 34.

Genus Prosimia. *Brisson.*

Incisors $\frac{4}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{4}\frac{5}{4}$,—32. *Superior incisors united in pairs; inferior ones long, inclined, and the outermost of each side largest; superior canines long and compressed; molars with blunt tuberculous crowns; two pectoral mammæ; head long and somewhat triangular; muzzle slender; ears rounded and hairy; tail longer than the body; hair soft and woolly.*

Prosimia Mongooz. (The Mongooz.) Upper part of head, neck, back, tail, and extremities, brownish ash or yellowish grey; throat, breast, belly, and insides of extremities, dusky white, more or less tinged with tawny; space between eyes and circle round them black; lower portion of face white; eyes orange coloured. Length from nose to root of tail seventeen inches; length of tail seventeen inches and a half.

Inhabits Madagascar.

Lemur Mongoz, Lin. *Syst. Nat.* 44. Mongous, Buff. xiii. Mongooz, *Glean. pl.* 216. Woolly Macauco, Penn. *Quad.* Shaw's *Zool. vol.* 1. *part* 1. *p.* 96.

Prosimia nigra. (Black Maucauco.) Fur black, very long on the sides of the head and on the neck; nose and under surface of hands deep black; tail longer than the body, rather bushy and of an equal thickness throughout; eyes bright reddish yellow.

Inhabits Madagascar.

Lemur niger, Geoff. *Ann. Mus.* xix. 159. Black Maucauco, Edw, *Glean. pl.* 217.

Prosimia nigrifrons. (Black-fronted Lemur.) Above greyish ash with a pale tawny or reddish tinge along the middle of the back; beneath white with a tawny cast; lower part of face, centre of forehead, crown of head and nape, deep black; rump, vent, and space about scrotum, a lighter black; sides of forehead over eyes and the ears, greyish grizzled with black; hands inclined to ferruginous; tail tawny grey inclined to black at the tip which is tufted. Length from nose to base of tail eighteen inches, length of tail fifteen inches.

Inhabits Madagascar.

Lemur nigrifrons, Geoff. *Ann. Mus.* xix. 160. Maki vi. Briss. *Reg. Animal,* 220. Schreb. *t.* 42.

Prosimia catta. (Ring-tailed Macaco.) Face white with a black circle round each eye; nose black; top of the head a

deep ash colour; back and sides a reddish ash colour, outsides of the extremities paler; belly and insides of extremities white; tail annulated black and white. Length from nose to base of tail one foot four inches; length of tail nineteen inches and a half.

Inhabits Madagascar.

Lemur catta, Lin. *Sys. Nat.* 45. Mococo, Buff. xiii. Macauco, Edw. *Glean. pl.* Ring-tailed Macauco, Pen. *Quad.* 1. 130.

Prosimia cinerea. (Ashy Lemur) Forehead very broad; muzzle pointed; eyes prominent: colour above greyish tinged with reddish yellow, beneath white; the belly and insides of the extremities tinted with yellow and grey; space round eyes, together with the ears and part of the cheeks, ash colour. Length from nose to tail fourteen inches, length of latter fifteen inches.

Inhabits Madagascar.

Lemur anereus, Geoff. *Mag. Encycl.* Petit Maki, Buff. *Supp.* vii. Grisset, Aud. *Hist.*

Prosimia rubra. (Black and red Lemur.) Upper parts of head and body maronne; under parts, tail, face, and hands, deep black; nape of neck white, and a similar coloured spot occurs towards the middle of each foot. The hairs which cover the cheeks and surround the ears are of a paler maronne than the rest; eyes yellow. Length from head to tail thirteen inches, length of tail nearly twenty inches.

Inhabits Madagascar.

Lemur ruber, Peron et Lesueur. Geoff. *Ann. Mus.* xix. 159. Maki roux, F. Cuv. *Mam. Lithog.*

Prosimia albifrons. (White-fronted Lemur.) Fur reddish grey above, whitish beneath; forehead of the male white, of the female dark grey; a black longitudinal line on the upper part of the head. Size of the Prosimia Catta.

Inhabits Madagascar.

Lemur Albifrons, Geoff. Aud. *Fam. des M. fig.* 3. Makis aux pieds fauves. Bris. *Regn. Anim.* 1. 221. ?

Prosimia fulva. (Yellow Lemur.) Fur bright brown above, grey beneath; forehead elevated and prominent; tail tapering towards the extremity. Size of a large cat.

Inhabits Madagascar.

Lemur fulvus, Geoff. *Ann. Mus.* xix. 161. Grand Mongous, Buff. *Supp.* vii.

Prosimia Collaris. (Collared Lemur.) Fur red-brown above, yellow beneath; top of the head grey; mane red; face lead-coloured.

Inhabits Madagascar.

Lemur collaris, Geoff. *Ann. Mus.* xix. 161. Maki d'Anjouan Mongous, *Var.* F. Cuv. *Mam.*

Prosimia albimanus. (White-handed Lemur.) Fur grey-brown above; sides of the neck a red-cinnamon colour; breast and hands white; belly reddish. Body fourteen or fifteen inches long.

Inhabits Madagascar.

Lemur Albimanus, Geoff. *Ann. Mus.* xix. 160. Maki aux pieds blancs. Bris. *Reg. Anim.* 221. Mongous, Aud. *Hist.*

Prosimia Macaco. (Ruffed Lemur.) The ears, the sides of the head, the upper and lateral parts of the neck, the space between the shoulders, the back, the sides and the outer parts of the fore arms and of the posterior extremities, white; the lower portion of the face with a thin sprinkling of short white hair: all other parts deep black; the tail in some specimens slightly grizzled with white; eyes yellow. Length from nose to base of tail twenty-one inches; tail the same length.

Inhabits Madagascar.

Lemur Macaco, Lin. Gm. Vari. Lemur Macaco, Geoff. *Ann. Mus.* xix. 159. Vari, Buff. xiii. Aud. *fig.* 5. Ruffed Lemur, Pen. *Quad.* 1. 231.

Prosimia subcincta. (Girdled Lemur.) The sides of the head, the under and lateral parts of the neck, the rump, the outer sides of the fore arms and of the posterior extremities, together with a narrow and nearly complete belt, immediately behind the shoulders, white; the lower portion of the face thinly covered with short white hair; eyes orange coloured: all other parts black. Size rather inferior to that of the preceding species.

Inhabits Madagascar.

Vari a ceinture, Geoff. *S. H.* Aud. *fig.* 6.

Obs. This and the last species have generally been considered as identical. In their native country they live apart from each other; and as males, females, and young ones of both kinds, are readily procurable, there can be no reason for longer regarding them as not distinct species.

Genus Perodicticus. *Bennet.*

Upper jaw,—Incisors four, nearly equal; canines two, conical and compressed with their anterior and posterior edges acute; first molar smallest, second larger, both conical, the third sharply tuberculated, two tubercles on the outer edge and one on the inner; fourth like the third, with the inside tubercle largest, the others not ascertained. Under jaw,—Incisors six, slender and inclined; canines like those above; the first and second molars

conical, the third with two acute tubercles on the outer side and one on the inner, the others not ascertained. Face shortish; muzzle projecting; nostrils lateral, small, and sinuous; head rounded; limbs nearly equal, long, and slender; index finger of hinder hand very short; tail of moderate length, and covered with hair like that of the body.*

Perodicticus Geoffroyii. (The Potto.) Hairs long, soft, and woolly, mouse-coloured at their bases, rufous in their middle, and paler at their tips, where some of them are white:—thence results on the upper surface and on the outsides of the limbs a chesnut colour with a slight mixture of grey; the under surface is much paler. The muzzle and chin are almost naked, having only a few scattered whitish hairs. Length of the head and body about eight inches, of the tail one inch and six tenths.

Inhabits Sierra Leone. *J. Boyle, Esq.*

Potto Prosman, Guin. ii. 35. No. 4.? Lemur Potto, Gm. Lin. *Syst. Nat.* 42.? Nycticebus Potto, *Ann. Mus.* xix. 165.? Galago Guineensis, Desm. *Mam.* 104. No. 127.

Genus Galago. *Geoffroy.*

Incisors $\frac{4}{6}$, *canines* $\frac{1}{1}$, *molars* $\frac{6}{5}\frac{6}{5}$—36. *Superior incisors separated in the middle; inferior ones inclined, the outermost of each side largest; molars with sharp points, the first on each side, above and below, having but one; two pectoral mammæ; head rounded; muzzle short; ears large, membranous, and naked; eyes very large, approaching; posterior members very long; tail long.*

Galago Madagascariensis, Geoff. (Little Galago.) Fur reddish; ears half the length of the head; tail longer than the body, and covered with short hair. Size of a rat.

Inhabits Madagascar.

Schreb. xxxviii. Aud. *Gal. pl.* 1. Rat de Madagascar, Buff. *Supp.* iv. *pl.* 19.? Lemur Murinus, Pen. *Quad. vol.* 1. *p.* 232. Le Moyen Galago, Cuvier, *Reg. Anim, tom* 1. *p.* 119, *note.*

Galago Brownii, Smith. (Brown's Galago.) Above fine grey, with a tinge of brown around the eyes; beneath white; tail as long as the body, hairy and brownish; eyes red. Size less than that of a rat.

Inhabits Madagascar.

Brown's *Illustrations of Zoology,* 4*to. pl.* 44. Le petit Galago, Cuvier, *Reg. Animal. t.* 1. *p.* 119, *note.*

Obs. Many Naturalists consider this, and the last described, as identical. The celebrated Cuvier however viewed them as distinct, and upon

* The specimen examined by Mr. Bennet was young, and the teeth were not complete.

his authority I have entered them as such, giving to the former the name of its discoverer.

Galago crassicaudatus. Geoff. Fur greyish red; ears two-thirds of the length of the head; tail bushy. About the size of a rabbit.

Inhabits Africa, *Cuvier*,——perhaps Madagascar.

Genus Galagoides. *Smith.*

Incisors $\frac{2}{6}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{6}{5}$ $\frac{6}{5}$,—34. *Ears large; hinder extremities very long; tail longer than the body, and tufted towards extremity.*

Galagoides Demidoffii. (Demidoff's Galagoides.) Fur red-brown; ears not so long as the head; tail reddish; muzzle blackish. Size less than that of the common rat.

Inhabits Senegal. ?

Galago de Demidof. Fisch, *Act. de Moscou*, 1. *p.* 24 *fig.* 1. Petit Galago Lemur minutus, Cuv. *Tab. element. des animaux, p.* 101.

Galagoides Senegalensis. (Senegal Galagoides.) Fur grey-red; beneath white; ears as long as the head; tail red. Size of a rat.

Inhabits Senegal.

Lemur Galago, Schreb. *fig.* Galago du Senegal. Geoff. Galago Geoffroyii, Fisch, *Act. de Moscou*, 1. *p.* 25. Whitish Lemur, Shaw, *Zool. vol.* 1. *part* 1. *p.* 108.

Obs. The circumstance of this and the last described having only two incisors in the upper jaw, seems to warrant their being separated from the true Galagos. When they shall be more accurately examined, other discrepancies will probably be discovered, which will furnish ample means for a description of the generic characters.

Genus Tarsius. *Storr.*

Incisors $\frac{4}{2}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{6}{6}$ $\frac{6}{6}$,—34. *Superior incisors contiguous, unequal, the intermediate ones large; the inferior small and crowded by the neighbouring teeth; canines less strong than the upper intermediate incisors; anterior molars with one point, the others with a large crown deeply hollowed; head round; muzzle very short; eyes excessively large, contiguous; ears long, naked, and membranous; tarsus three times longer than the metatarsus; tail long.*

Tarsius fuscomanus, Geoff. (Yellow-bearded Tarsier.) Fur clear brown above, greyish-white below; ears two-thirds of the length of the head. Size a little larger than that of the field mouse.

Inhabits Madagascar.

Tarsius Fischerii, Desm. *Dict. Hist. Nat. ed.* 1. Tarsius fuscomanus, Fisch. Anat. Maki, *fig.* 3.

(*To be continued.*)

SOUTH AFRICAN

QUARTERLY JOURNAL.

SECOND SERIES.

No. 1. OCTOBER—DECEMBER, 1833. Part 2.

An Account of the Amakosae, a tribe of Caffers adjoining the Eastern Boundary of the Cape Colony. By N. Morgan, Esq. Assistant Staff-Surgeon.—(Abridged.)

[Continued from page 12.]

The kraals or villages of the Caffers are situated on rising grounds near the sources of the various streams, or at the heads of the different ravines, where water is to be found. They consist of several huts of an hemispherical form placed in a semicircular position, to enable them to have a view of their cattle-fold which is formed of bushes and is in the middle of the villages.

In the building of their huts a frame is first constructed by fixing a number of long boughs in the ground in a circular manner, about six inches asunder; they are bent over and fastened to each other at the top, and are bound to other boughs laid round and diagonally over the former, with the inner bark of the Tye Boom and Mimosa; they then thatch the whole frame with flags and long grass. One small aperture is left to serve as a door and for windows and for the escape of the smoke from the fire. The inside is plastered a few feet from the ground with cow-dung and sand, and the floor is made level and smooth with a similar composition. A circular place is left in the centre surrounded by a ridge an inch or two in height: this is the hearth, and on it is made the fire. These huts are of various sizes, from ten to twenty feet in diameter. When large, the roof is supported by several posts placed without any regularity round the fire hearth at a sufficient distance to prevent them taking fire: though the circumference of these huts varies so much, yet there is scarcely any difference in their height, which is generally from six to seven feet, rarely ever exceeding the last measurement, and though the larger ones are very flat on the top, yet they are covered so very close and firm that they are no more able to be penetrated by rain than the smaller ones.

Within sight of their kraals, generally on the opposite side of the ravine or kloof, are situated their corn fields or gardens. The Caffers inclose an extensive piece of ground, taking advantage of natural help, though they bring into cultivation the moist and fertile parts only. In the fields, the cultivation of which is often the labour of several families, are erected temporary huts to afford a shade for the children who, when the corn is sown, are stationed there to prevent the entrance of cattle, and as the corn ripens to keep off the birds. This is often the occupation of the whole family, as these little creatures are a formidable enemy to the crop of corn. In these gardens they cultivate Indian and Caffer corn, melons, pumpkins, beans, and a little tobacco. They have not acquired the method of preparing this last article so as to make it agreeable to the European smoker. In preparing and cultivating the land, they first clear the ground of weeds, then they throw the seed on the surface, and cover it lightly with the soil, using small wooden spades; and when it appears a little high above ground they again carefully destroy the weeds, thinning the corn and throwing a little earth about the stem. When it is ripe enough to be gathered, they cut off the heads, and either hang them up in their huts or place them on a frame raised some height from the ground to secure it from the depredations of vermin and cattle. After it has been kept some time in this manner, they beat the grain out, and put it into small holes prepared for that purpose in the centre of their cattle kraal; each hole is capable of containing about two sacksful. On the top they throw a quantity of the stalks to absorb any moisture that may happen to penetrate through the earth and the manure that is placed over the stone covering the entrance. These granaries are opened only at particular times. Corn so secured will keep sweet and good for a great length of time, though, if the season has been wet and it is stowed away a little damp, it sweats and becomes sour, which is not thought of much consequence to their taste.

The employment of the men consists in hunting and snaring different animals. The skins of the antelope and feline tribes are preserved and formed into karosses, or sold to the European dealer.

Their attention is however chiefly engaged by their cattle:—these they herd, protecting them with great care by night and day from the depredations of their fellow-creatures and the attacks of wild beasts. The milking them also is the work of the men, as is the making and repairing of the folds; the bags for holding the milk are their work; these they make of raw hides which are so firmly sewed together by thongs of the same material as to be quite impervious to their contents: they are

large, each being capable of holding several gallons; and a neck is left at one corner which is tied round with a string to secure the milk.

The employment of the women is of a more various nature: on them devolves the task of fetching wood and water; and of making the bread from the ground Caffer corn. This they prepare for that purpose by rubbing it into meal on a flat stone with one that is of a cylindrical form held in the hand; the meal so made is formed into flat cakes with water, and baked on the embers of their fire. Their own apparel, and also that of the men, is made by the women only; the skins are prepared and sewed together with great neatness. An awl is used instead of a needle, and the thread is formed of the fibres of the expansion covering various parts of the flesh of the ox. But the most laborious of their occupations are the building of their huts, and the cultivation and harvesting of the corn, which is entirely their province, though at time they are assisted by some of the family of the male sex.

The person of the Caffer is of a dark brown color approaching to black; the hair short and curly; he has a beard; he is straight and well proportioned; his features are regular; nose a little flat, and lips inclined to be thick; the teeth very white and even; aspect various, but generally of a grave and pleasing cast; in sight and hearing they are uncommonly acute—but the organs of feeling, smell, and taste, are hardened like the rest of their body. They possess great agility, but less bodily strength; are more averse to labor, and more patient of hunger, than the Europeans.

The complexion of the female does not differ from that of the male; many of them are very handsome. Girls arrive at maturity generally in their 12th or 13th year. They appear to live naturally to a very old age, as is indicated by the decriped and shrivelled form of so many amongst them: they are subject to injuries and accidents from their pursuits in the chase and war. There are not many diseases peculiar to these people. The tænia (tape worm) appears to be the only one that can be called endemic: dyspnœa, sicca, and rheumatism are not uncommon complaints, most probably produced by smoking noxious herbs, fatigue and exposure to atmospheric changes.—Gonnorhea, paralysis, and glandular swellings are also complaints to which they appear subject. In their treatment of disease no regard appears to be paid to the character of the complaint; the treatment is generally loss of blood by a rough sort of operation, consisting of scarifying and drawing blood after the manner of cupping amongst us. Roots are infused in water which communicate a purgative quality, and sometimes an emetic root is given to the sick person. In pains and aches of

the bones and limbs, they burn a preparation similar to the moxa: they have lately substituted gunpowder, if it can be obtained. If the complaint does not leave them under this treatment, or it is of a nature that is not very common or generally known, they attribute it to the act of witchcraft. Attacks of colic not unfrequently seize some of them: if the sufferer be a chief or person of note, it is attributed to some charm of an evil-disposed person, and the effect of an evil eye is a cause often assigned by them for the various local complaints to which the human frame is subject.

The general disposition of the Caffer is gay, with an apparent carelessness of the future. They are very hospitable, and in their intercourse with each other they appear friendly and jovial: with strangers they are reserved though pleasant, and attentive and ready to oblige.

A regular union between the sexes and the rights of marriage are recognised. There is a plurality of wives allowed by custom. The number taken depends upon the inclination and wealth of the man only. The marriage contract is a purchase; the man buys the woman of the parents, and the equivalent given is cattle. Though the condition of their women is not so degrading as that of many other rude nations, yet they are treated with a sort of coolness and insensibility that proves it to be more like the union of a master and his slave than of equals united by affection and interest. They are affectionate and appear much attached to their offspring, but the affection, like the instinctive fondness of animals, seems to cease as soon as they attain maturity. Little instruction is necessary to fit them for that life which they enjoy. Their inheritance is the free gift of the parent, who commonly sets by a part of his flock as a gift for his children, and though, when the child is young, they dispose of this part at their own pleasure, or it is liable to be taken by their chiefs, yet when the youth takes the management of them in his own hands the parent has no claim on them, nor has the chief any claim to interfere with them more than with the property of any other; they are by all esteemed the right of the person who has so acquired them. The wealth of each individual consists in the number of cattle he possesses. This is the standard of the wealth of the whole nation, for being a pastoral people no other species of property confers the acknowledgment of riches on the possessor.

The ornament of their persons consist of buttons, beads, ivory, and brass rings. These are acquired by the sale of cattle, hides, ivory, and the produce of their lands to each other, and to European traders. Their dresses, and their weapons of war, and those used in the chase, are also highly prized by them. The assagai or javelin is the property of the

chief, and cannot be parted with except with his express consent, not even when it is made entirely at their own expense; so also is the shield and the war feathers: these latter articles are kept in the possession of the chief, and are a symbol of his authority over them. They are trusted to the warrior only during the time of service, and are restored by him when the war is over.

The dress of the Caffer is very simple. The hide of the ox is dressed and softened in a manner peculiar to themselves, and is formed into a mantle which is worn over their shoulders and round the body, and reaches down to the ancles. A small cylindrical piece of skin hangs in front. When they dress themselves for war they lay aside the large mantle which is called the kaross, and fasten a small buckskin around their loins: their head is encircled with a fillet of leather, having the long shoulder feathers of the blue crane fixed erect, one on each side over the ears. On their left arm they carry a large oval shield made of the dry undressed hide of an ox: it is about five feet high and three feet wide. The offensive weapons which they use are a sort of javelin, called the assagai, and a stick with a large nob at the top. Their heads are dressed with a composition of red earth and grease; the hair is rolled up into little curls, which are retained in that form by small lumps of the above composition: the whole surface of the bodies is rubbed also with the same preparation. Their chiefs are distinguished by a band of beads curiously arranged, which is worn round their heads: their karosses are trimmed with the skin of the panther. This skin is the distinguishing mark of power: none but chiefs are permitted to have any of it about their persons. Ivory rings in various numbers are worn on the arm above the elbow by both sexes, as are also brass rings on their right wrist. The covering of rings extends some height up the forearm, and appears to be useful as well as ornamental, as it affords a support to the tendons of the hand and wrist in the violent strain which the action of throwing the assagai produces. A number of strings of beads of various colors, worn loosely about the neck complete the dress and ornaments of the Caffer man.

That of the female is more complicated. They wear, suspended to their waistband, a small triangular piece of dressed skin which hangs down before them, and is fancifully covered with various sorts of beads. Round their loins they wear a cloak of prepared bullock's hide, which reaches down the legs to their middle. Their breasts are pressed down by a stomacher of the same materials: this is also ornamented with beads. Their outer garment is a large mantle which covers the whole of the body from the shoulders to the ancle: from between the shoulders a narrow piece is folded back, and hangs down to

the bottom of the mantle. It is ornamented with three perpendicular rows of buttons, one on each side and the other in the middle. The art of swaying this from side to side in the most graceful manner is the study of the Caffer belles. The head is covered with a sort of cap or coronet thickly studded with the most valuable beads, fastened on it in the most tasteful manner they can devise. This is the most valuable article of their dress, the skin of the most scarce buck being used in its formation;—and the placing it on the head so as to show the ornamented part to advantage is a favorite study of the women. The whole dress of a female will weigh above 25lbs. The female children wear the small garment that depends from their waist as soon as they begin to crawl about, and as they grow up gradually assume the whole dress. The male children go naked till the time of circumcision, when they assume the small cylindrical article of dress, and others when they can acquire them. When they have fixed upon a time to perform this operation which does not appear to be done at any particular age, all the children are assembled together, and it is done by the principal person of the kraal. The operation is performed invariably with a sharp stone, and forcibly brings to mind Exodus iv. 25: nor is it, as generally supposed, always performed about the time of puberty, for, as there are various privileges to which the children are entitled after the operation, which they cannot have until then, their parents, to qualify them, frequently perform it at a very early age. I have seen many that had not arrived at six years of age, who had been long circumcised. They must undergo the operation before they can reside at the chief's place; and as this is a circumstance much desired by the parents it is the principal cause of the operation being performed so early. There are also many other privileges possessed only by those who are circumcised; but they are still continued to be looked upon as children, and have not all the privileges of men until they become of an age that renders them able to "lift the Shield." Their bodies are then rubbed over with white clay. A dress consisting of a girdle of reeds for the head and another for the waist—the former hanging down over their face and shoulders, and the latter over their thighs snd knees—is then put on them, and they are all secluded in a lone hut for two or three moons; but they have the liberty of going about the place of their seclusion. They avoid and are avoided by all, especially the women. No female approaches them, and if they discern any at a distance they cover their faces with their reed veils, and retire to the huts. At the expiration of the time of separation, they wash and clean themselves, —that is, they get rid of the white clay and put on red. The hut is set on fire—their apparel and every thing that has been

used by them is torn or broken up and cast into the flame, and they join in their families and engage in their occupations and amusements. On the first appearance of puberty the girls are secluded from society for a week or two. The father announces the circumstance and invites his friends and neighbours to a feast, at which a number of oxen, in proportion to the wealth of the parents, are slain, and the number of animals required to be given on the marriage of his daughter is declared. From this time the girl may associate with the women.

When any person is attacked with a disease of an unusual nature they attribute it either to witchcraft or the administration of poison; and a person, who is designated by them Igiaka,—that is, the Doctor—is sent for. He gives some root or drug to his patient, and accompanies the administration of the remedy with many uncouth grimaces and an apparent mystery of manner, which is for the purpose of drawing out the disease which they say is caused by some noxious animal or reptile that has been charmed into the sick person by some enemy; and they manage with great dexterity to produce a small snake or lizard, or a piece of wood or stone, which they declare they have charmed from the patient. If the sickness leaves them, the doctor obtains an increase of celebrity for his skill, and an adequate reward for his trouble. But if the person gets worse, they send for Doctors of another sort, called Igiaka-isi-nusikaza, or "the discoverer of bewitching matter," who are commonly employed to point out the person who has bewitched him; and this being done after many ceremonies, the charge is made before the chief and the principal men of the division, and the unfortunate victim is taken and put to the torture to make him or her declare the charm that has been used. The most general method of torturing is by stretching him out on the ground quite naked: his hands and feet are made fast to four stakes placed at some distance from each other; stones are made hot and applied to the arms, legs, sides, and various other parts of the body; the nests of the black ants that build in trees are thrown on the body, and are then broken to pieces; the irritated insects commence their operations on the skin of the sufferer.

This agency of superhuman influence is supposed to be employed in revenge for an injury or insult, either given or imagined to have been given. The person using these means against another, is conceived to have obtained something that belongs to the body, such as parings of the nails, a lock of hair, the saliva or other secretions, or perhaps pieces of clothes,—these are mixed up with various articles that are picked up about the hut or kraal of the individual. Such are said to be the means by which sickness and death enter the person be-

witched. It does not appear that any ceremonies or incantations are performed over these articles, but they are deposited in a place of secrecy, and then sickness begins to afflict the person to whom they belonged, and death ensues if the bewitching matter is not discovered.

There is no doubt that many of these accusations are made by the Igiaka to excuse his want of success in the cure of disease, but they are often used by the Chiefs as a means to obtain the property of their wealthy subjects, or to rid themselves of a too powerful one: in this case sickness is feigned, the Igiaka points out the person or persons who are the cause, sometimes accusing them of poisoning, at others of bewitching the Chief. Confiscation of property, torture and sometimes death are sure to follow. Though we may believe that no means are actually used to effect these purposes, yet it is certain that there have been instances of individuals who, on the point of being put to the torture, or during its application, have confessed giving something to cause illness, or having employed the bewitching matter, and have told where it was secreted. In some of these cases where an opportunity has occurred of conversing on this subject with the individuals who have escaped on making this confession, they have without scruple stated, that they knew nothing about it, but that when they have been accused, or feared that they should be so, they themselves or some of their friends, have made up a parcel and deposited it in the place which was afterwards pointed out to the Igiaka. Sometimes no discovery can be made, and the Igiaka finds it out himself, and then the person whom he accuses of having secreted it is sure to be put to death.

During the sickness of some of the great Chiefs the accusations have been numerous, and many deaths have been the consequence, for if the Chief does not get better, after one is killed another follows, and an end is put to this horrid system of murder only by the death or recovery of the Chief.

By this practice the people are kept in the most humiliating fear and superstitious dread of the Igiaka-isi-nusikaza.

There are instances also of persons suffering much from pain and disease who have got better from the time of the discovery of the bewitching matter; affording another proof of the effects of the imagination on the sufferings of the body. A deep impression is made on the mind of the afflicted individual that his health, and probably his life, are in the hands of some unknown foe.—Hope flies,—he becomes the victim of despair, and views himself as already in the grasp of death, from which no way of escape is open but by obtaining the "bewitching matter." In this state he employs a person who, as he has been brought up to believe, has the power of showing where it may be found, or

at least pointing out the person who has by this means caused his sufferings. When these ends are obtained—Hope returns, Despair flies, and, in its train, those sufferings which had their origin from this cause. Health is restored, and another proof of the existence of witchcraft and of the power of their sorceries is treasured up in the heads and hearts of the people.

When any article is lost they also apply to the same persons, who, after performing some ceremonies, which at times last several days, proceed from the place in an apparently mysterious mood. The conjuror is followed by the people, and when he stops they commence a search. Sometimes it is successful, and the lost article is found; but more commonly he leads them to the bank of a stream where it is very deep. The search is useless, and they conclude it has been thrown in by the thief. The guilty person is never pointed out.

To persons called Igiaka-lumsulu, or rain doctors, they apply when there is a want of rain. The manner of the application is as follows:

The whole of the warriors of the tribe assemble, clothed in martial array, and proceed in great state to his residence with the offerings that are to be made to the conjuror. On their arrival their present is offered and their request for rain made known. A feast is then made, and the cattle of which the offering consists furnish the viands. Dancing is commenced, and is continued for some days, during which the conjuror pretends he is using his charms. He then gives them some instructions and dismisses them. The instructions delivered are of the following kind, and on the observance of them the requested rain is to follow—that, they are never to look behind them during the journey—sometimes that they must not look to the right or left—at others that they are to keep a strict silence, not to speak to each other, or to any they may meet—also, at other times they are directed to make every person they meet return with them, and to be subject to the same restrictions that are imposed on themselves. If rain follows they attribute it to the charm of the conjuror and to their observance of his instructions. If the desired event does not happen they blame themselves for an involuntary departure from his instructions, and the same farce is repeated.

Upon the howling of dogs they imagine they shall have bad news.

If a person kills or hurts one of the ardea pavonia, or crested cranes, they believe some of his family will soon die: and if they should appropriate to their own use the produce of land that has been torn up by the elephant, or if a young elephant should be taken alive, or should stray into a field, they believe that the elephant will come and destroy the person or persons to

whom it belongs. Before they attack an elephant they shout to it, and ask pardon for the intended slaughter, professing great submission to his person, and stating the necessity of their having his tusks to enable them to procure beads, &c., and to supply their wants. When they kill one they deposit a few of the articles they have obtained for the ivory, along with the end of his trunk, in the ground, which they think saves them from some danger that would otherwise befal them.

When a woman has twins two euphorbium trees are planted before the hut, and by the growth of them they pretend to know whether the children will both live or die; for if one or both of the trees should perish so they say will happen to the twins.

They believe that the spirits of deceased persons visit the place of their former abode, and that they often appear to surviving friends. This is the reason they assign for destroying his dwelling, and removing the village on the death of any person. In various parts of the country great heaps of stones are observed, and those that pass by always throw a stone or some substance on the heap. They assign no reason, nor are they conscious that any necessity exists, for their doing so.—They are equally ignorant of the origin of these tumuli. The first time they cross over a running stream they stop in the middle and drink of it, first throwing into it a small branch of a particular tree which they take care to provide themselves with before they come to the river.

They drink the gall of the ox, stating that it makes them fierce and inspires them with courage. The method of killing their cattle is by throwing them down on their back, and making an incision through the integument below the sternum: by this they introduce the hand, and passing it below the stomach they appear to tear asunder the blood vessels that are in the abdomen. The breast is the perquisite of the King or principal Chief, and they often carry it a great way for his use. Some particular parts are abstained from by females at stated times; and on the death of any relation, or of an husband or wife, the survivor is also prohibited by custom from eating some portion of the beast.

When any person is sick and supposed past recovery, they assemble round him and keep up a constant noise by knocking on dried hides and singing. Sometimes he requests to be conveyed into the bush that he may not be disturbed by the grief of surrounding relations. If this is complied with they attend him constantly until he dies, but if the disease is supposed to be contagious they leave him to his fate. On the death of the husband or wife the survivor leaves the kraal, avoids society, and retires into the bush. They live thus for one or two moons.

Their food is carried and deposited in a particular spot from whence they take it. If the survivor be a woman, and she have an infant at the breast, it is taken care of by some neighbour, who carries it to the mother once or twice a day to receive nourishment. After the period of seclusion they begin to return to the society of their friends, first by night then by day, when all the kraal assemble and set fire to the hut which was inhabited by the deceased, breaking all the utensils and burning them in the flames of the hut. The survivors, all relations and friends, shave the whole of their heads.

On the death of a Chief or any of his family, the like custom is observed by all who were under his rule. The burying place of the Chief or his family is in the cattle kraal*; that of the common people is in the holes formed by the ant bear or other wild animals, which they fill up with stones or dirt. Upon the death of a man his chief takes all the cattle that were his property. This custom has been laid aside both by Un Botuman and Un Thlambe, who, on the death of any of their men, appointed a guardian to the family, to whom are given up all the flocks of the deceased, to be held in trust till they become of sufficient age to manage them themselves.

The only manufactory amongst them that is carried on by a distinct set of men, is the making the heads of the assagai, the forming of axe heads, and the making of their sewing needles or awls; and he who practices this art is held in great estimation amongst them. The only tools are various kinds of hard stones, as hammers and anvils. Flexible boughs of green wood for holding the hot iron—and a bellows formed of an entire buckskin; the legs are tied up, and to the neck is fastened the horn of an ox which is perforated and forms the tube for the exit of the wind; the other end of the skin is open and two sticks are sewed to the brim—these have two loops on, one to receive the thumb the other the fingers. The method of using them is as follows:—a forge is formed on the ground by erecting a bank of earth a foot or two in height; this serves to secure the nose of the bellows and protects the skin from the action of the fire, which is made in front of the bank: a hole

* When the chief is buried the cattle kraal is filled up with bushes, and the huts are all deserted. An extent of country is marked out, over which no person must pass or cattle graze. A breach of this rule is punished with confiscation of property, and if committed by a stranger the punishment is slavery. A certain number of cattle—bulls, cows, and calves—is turned out on this land, and they are ever after held sacred; they cannot be killed or even milked, but live on this spot, herded by people set apart for that purpose. When the grass has grown over the grave the land is relieved from this taboo, but the cattle are still held devoted, and they die and rot on the spot, no part of them being taken or applied to any use whatever.

to communicate with the nose of the bellows and to permit the wind to act on the fire passes through it. The man who uses these machines (for there two in use at a time) pulls one of the skins out, at the same time pressing the other towards the bank: in the act of extending it, he separates the thumb and fingers, thus opening the orifice of the skins, which then become full of air. He then shuts his hand that closes it, and pressing the skin to the bank the confined air rushes out through the horn—by thus alternately acting nearly a constant stream of air is supplied to the fire.

The method of calling the people together, or of declaring the will of the chief, is by the voice. Several persons who are constantly (unless thus employed) about the person of the chief are sent different ways—these keeping the high grounds run along shouting with a loud voice, calling the attention of the country through which they pass. On hearing the voice, the heads of the kraals dispatch messengers who run and meet them at different points of their journey, and receive in a few words the nature of the business or duty that is required. One messenger goes from the residence of the king to that of a principal chief, promulgating the news as he goes along. He is here relieved by another who in like manner disperses the intelligence—and thus in a comparatively short time, it is made known over all the land. Most private intelligence is conveyed in the same manner, only the messenger proceeds on his journey without noise, and delivers the message only to the person who is appointed to receive it.

The meetings of the people are always attended with dancing. When a council is summoned the different members appear with a number of their followers, and while these latter are dancing and partaking of the flesh that is provided by the chief at whose kraal the assembly is held, their chiefs, squatted on the ground in front of the dancers, gravely smoking their pipes or partaking of the feast, state facts, dispute, contest the particulars, and debate upon the merits and demerits of the cause before them. Some occasionally will lay down and sleep, or join in the dance. According to the importance of the subject so is the length of the council. Sometimes it will last for several days, during which the feasting and dancing are continued with very little intermission. Even the night, if the moon afford her light, is a witness to the uncouth gestures that these people exhibit in this amusement.

On the celebration of the marriage contract the dancing and feasting are kept up with great spirit. The people having assembled together at the kraal of the bridegroom, they begin the dance by forming themselves into several ranks, about 30 or 40 in each, and lightly holding each other's arms with the

left hand, having a stick or assagai in the right. They commence stamping and beating the ground with their feet making a sort of humming noise with their voice. As they get animated they proceed to leap up in a simultaneous manner, increasing the power of their voice until it arrives at its highest pitch. It has now lost its drawling sound and assumes that of loud monotonous shouts, to which they keep time with their movements. In the rear of the men the women assemble, who, moving their bodies forward and backward, join in the shouts of the men harmonizing with their tones, so that at a distance the sound has not an unpleasing effect on the ear. After some continuance in this exercise of the body and lungs the first rank of the groupe, which before this has increased to a large number, (for there are continually fresh arrivals and departures,) turns to the right, and throwing themselves into a variety of attitudes, stamping with their feet, and violently expelling the air from their lungs with a noise not much unlike the sound produced by the pronouncing of the syllable "hush," they slowly circumambulate the groupe of what may be called stationary dancers, keeping time with them in the various attitudes they make, which are of a pantomimic nature. A certain number of women also accompanies this party, proceeding in a row by their side, and shaking their persons particularly their shoulders in a violent manner, at the same time uttering the same sounds as the men, whom they appear to exceed in making the greatest noise. Though a bystander may find great pleasure in observing the many elegant attitudes into which the men throw themselves, yet it is impossible to refrain from laughter when he casts his eye upon the uncouth and ridiculous figure the females exhibit in these amusements. The violence of the exertion causes the perspiration to flow in copious streams from their bodies, and the exhausted creatures are from time to time relieved by others, who form the party of spectators, during the time they rest, and thus the dance is kept up for an indefinite length of time. The length of time this dance is kept up depends upon the wealth of the bridegroom and his friends, and the assembly is fed during its continuance by them. The ceremony is always performed on the last day, so that its performance is the token that the dance is at an end. When the marriage is about to take place it is commenced by a number of women, who come about and clear the cattle kraal and the space for a great length before it. Upon this the party who had been circumambulating the stationary dancers retire and mix with this groupe which continues its dance the whole time. The old women from time to time run about shouting and striking the ground with long sticks. At length a line of warriors fully equipped with their feathers and shields appear and take up their position about 100 yards in front of the

entrance of the cattle kraal which is on one side of the dancers. Here they stand concealing their bodies with their shields, which are placed upright by each other, thus preventing the spectators from observing what is done behind them. Another party of warriors form opposite these and possess themselves of the cattle kraal. After some time the ranks of the upper party opens in the centre, and a party of young men appear all ornamented alike, having their heads neatly dressed with red clay, and bound with fillets of beads, from which at the back is suspended a bunch of black horse hair about half an inch in diameter and seven or eight in length. They are quite naked, excepting that a small buckskin tied by the hind feet round their necks, and hanging down, scarcely covers their shoulders, and reaches to the bottom of their loins. They hold assagais in their right hands by the small ends in an upright position, excepting the centre one who holds his in the middle—this is the bridegroom. The party comes down and forms the front line of the dancers. A short time after this the same party of warriors again divide their ranks, and three young girls appear ornamented in the same manner as the men, with the small buckskin round their hips instead of their shoulders. The centre one is the bride, and she alone carries an assagai in her right hand. An old woman attends them at a short distance, and appears to be their directress during the ceremony. They walk in a very slow and solemn manner forward towards the cattle kraal, the same set of old women still running about shouting and pretending to drive some animal from their path. In this manner they proceed, and entering the kraal a short distance they stop. The bride then thrusts her assagai into the ground, and faces about leaving the assagai sticking upright, and in the same solemn manner they return. At their exit from the kraal the old women, who had been so busy in appearing to keep something away from the path, begin to perform another pantomimic representation, and appear to be engaged in all the various duties that will devolve on the bride in her new state, such as digging the ground, sowing, cutting, thrashing, and grinding the corn, fetching wood and water, nursing the children, &c. When the party passes the warriors who are ranged near the kraal, one of them rushes out and pretends to be engaged with some enemy. After some time spent in a seeming attack on his adversary and a defence of himself, he appears to have received a mortal wound, for he falls, arises, and falls again, endeavours to rise, defends himself on his knees, is again wounded; he tears the weapon from his body, hurls it at his enemy, and then falls on his shield, and, after writhing about tearing and biting the earth, seems to expire. This representation is given to point out that her future husband will protect and defend her in her

domestic occupations, and that she has a warrior for her husband whose fate may be—death in the field from the hand of a foe. After this the bride's party proceed towards the assembly of the principal men, who are sitting down in front of the dancers. Here they stand awhile showing themselves and turning round as they are directed.

In one ceremony which I saw, and with the description of which I shall now close this account, because, from repeated observations since, I have found it to be the constant and unvaried manner of its being performed.

The bride is now subjected to the jest and ribaldry of the party, and the poor abashed creature, from the drooping head and glistening eye, appeared to be passing a severe ordeal to her feelings. After a time, during which these lords of the creation seemed to enjoy the confusion of the bride and her companions, the procession moved on towards the groupe of females. Her former sufferings appeared to be nothing to what she was now fated to endure, for abuse rather than jests, and threatening in the place of ribaldry, now took place. Some pointed out in the most dismal colours what she would have to suffer now she was a wife, and others pointed out the defects of her person, and called upon all to observe them; this was uttered in loud and discordant tones, accompanied by the most violent and menacing gestures, so that at times I feared some harm would befal them, but it was only a part of the ceremony, and the concluding part, for the old women suddenly threw over them haresses, the warriors from the kraal rushed forward and enclosed them round with their shields and hurried them off to one of the huts. If the man should take two wives at the same time, the same ceremonies are gone through by each separately, the second commencing when the first is completely finished.

These feasts are generally concluded by an ox race. The animals which are to strive against each other, are taken out with the cattle some miles from the kraal, they are driven out from these, when a messenger is sent to them, and from being frequently practised in this manner, they immediately run off with great speed, the Caffers running and shouting after them: the first that arrives at the kraal is the winner, and becomes the property of the Chief, or any Caffer who will give a certain number of cows, which is fixed on before. On some occasions this price has been fixed at five cows, which is a great price, for the generality of oxen are of less value than cows amongst them. On one marriage lately the feasting lasted eight days, eighteen oxen were slaughted by the bridegroom and his father, besides several that were presented by the Chief. Sour thick milk, which is the constant beverage of these people, was supplied to

the assembly by the voluntary gift of the neighbouring people. Poles were erected at different places round the scene of the festivity, on which were suspended green boughs,—to these places were brought skins of milk; and numbers of baskets, out of which they drank, were kept constantly filled. Several children were employed in fanning away the flies, that would otherwise soon fill the vessels to the great annoyance and disgust of the Caffer, who has the greatest dislike to those insects.

(*To be concluded in the next.*)

PROCEEDINGS OF THE SOUTH AFRICAN LITERARY AND SCIENTIFIC INSTITUTION.

October 2.—Dr. Smith called the attention of the Society to several South African birds which were placed upon the table, but more particularly to the following, which he described and named:

Crithagra albogularis. Above greenish grey with some dark variegation; rump and tail coverts greenish yellow; chin, throat, and eyebrows white; breast and flanks dusky grey; centre of belly, vent, and under tail coverts white; wing and tail feathers brownish, slightly edged with dull white. Length five inches and a half.

Inhabits South Africa.

Sir Wm. Jardine, it was stated, regards this as the female of *Crithagra sulphurata*, but it was added, that they are never found associated together, nor even in the same localities.

Corythaix concolor. Forehead with a long crest, which, with the entire plumage, is greyish, faintly mottled in some places with fine, dull, reddish white transverse lines; quill feathers dark brownish; tail very long, hoary grey with a deep greenish gloss, particularly towards the tip; bill, legs, and toes black. Length nineteen inches.

Inhabits South Africa, inland of Port Natal.

It was remarked that this bird differed in several points, particularly in the form of the bill, from the typical species of the genus, and that it might hereafter require to be made the type of a new division, under the name of *Corythaixoides*.

Francolinus Natalensis. Top of head, back, scapulars, shoulders, and tail, light brown, finely mottled with brownish black and tawny white, the former in the shape of longitudinal blotches upon the scapulars; eyebrows, sides of head, neck, breast, and anterior part of belly, variegated black and white; posterior part of belly, vent, and under tail coverts, a mixture of black, tawny white, and light brown; bill reddish brown; legs, toes, and claws, reddish yellow; eyes brown. Length from bill to tip of tail twelve inches and a half.

Inhabits brushwood thickets in the vicinity of Natal.

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 32.

Genus Macromerus. *Smith.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$,—30. *Upper jaw,—incisors contiguous, unequal, the intermediate two much the largest; canines long, pointed, slightly curved, and somewhat triangular; first and second molars crowned with one point, third and fourth with four, and the fifth with two, and an elevated somewhat dentated edge behind. Lower jaw,—incisors horizontal, nearly equal; canines almost the same length as the molars, slightly pointed and somewhat triangular; first molar with one point, second and fourth with five, and the third with four; muzzle short; head roundish; ears small and rounded; body slender; thighs very long; tail about the length of the body, and covered with shortish fur; thumbs of hinder hands very long, depressed, and broadest at the points, which extend considerably beyond the nails; nail of index finger long, slender, and pointed; the nails of all the other fingers short, flat, and somewhat pointed.*

Macromerus typicus. (Long-legged Lemur.) Face surrounded by a circle of white fur; upper and lateral parts of head and neck deep clear black; shoulders and anterior portion of back grizzled black and clear silvery grey; posterior part of back dull silvery white; outsides of extremities tawny or pale rufous white; throat, breast, and belly, clear white; inner sides of extremities and tail white with a faint tinge of tawny; anterior hands black; face black with a semicircular space under each eye, covered with very short white hair. Length from nose to base of tail nineteen inches; length of tail sixteen inches.

Inhabits the interior of Madagascar.

Obs. The only specimen of this beautiful species which I have yet seen is in the possession of Mr. Verreaux, the Curator of the Museum of the South African Literary and Scientific Institution. With a liberality characteristic of his countrymen, and at the expense of his specimen, he spared no trouble to extract the skull in order to furnish me with the means of detailing the generic characters.

Genus Cheiromys. *Cuvier.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\frac{0}{0}$, *molars* $\frac{4}{3}\frac{4}{3}$,—18. *Incisors very strong, excessively compressed, corresponding perfectly in both jaws like the incisors of the gnawers; molars with flat crowns; anterior extremities short; thumbs of anterior hands short and free, the fingers very long; thumbs of posterior hands short, opposable, and furnished with a flat nail; tail long and bushy, two inguinal mammæ; muzzle sharp and pointed; eyes and mouth large.*

Cheiromys Madagascariensis, Desm. (The Aye Aye.) Head, spaces round eyes, the upper parts of body, and the extremities, ferruginous brown; the outer sides of the latter and back with a blackish tint; the sides of the head, the neck, the lower jaw, and belly, greyish; tail entirely black. Besides the more regular covering there are some greyish coloured woolly hairs of about two or three inches in length, scattered over the whole body. Length from nose to base of tail from fourteen to eighteen inches; tail about the same length.

Inhabits Madagascar.

Lemur psylodactylus, Schreb. *Supp.* Shaw, *Zool.* 1. 109. Sciurus Madagascariensis, Gm. *Sys. Nat.* Aye Aye, Sonnerat, *Voy. aux Ind.* ii. 142. Aye Aye Squirrel, Pennant 2. 142.

Genus Cheirogaleus. *Geoffroy.*

Incisors $\frac{4}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{6}{5}\frac{6}{5}$,—36. *Upper jaw,—Incisors in pairs much apart, the foremost of each pair largest; canines conical and curved, first molar subconical compressed and like the canines, the second three-sided and pointed, the third with two tubercles, one on the outer and one on the inner side, the fourth, fifth, and sixth with three tubercles, two on the outer edge and one on the inner. Under jaw,—Incisors nearly horizontal, the outermost of each side largest; canines somewhat conical, inclined forwards, and slightly curved; first molar inclined to conical with an obtuse point, the second, third, fourth, and fifth each with a blunt tubercle towards the anterior edge and a deep excavation behind. Head rounded, face short and covered with fur; eyes approaching; anterior extremities shorter than the posterior; nail of index finger of all the hands pointed, elevated and slightly elongated; nails of the other fingers flat, pointed, and in contact with the soft parts below; ears membraneous, projecting beyond the fur, and with a thin sprinkling of short hair; tail about the length of the body, cylindrical and slightly flattened beneath.**

Cheirogaleus typicus.—Upper parts of head, back of neck, space between shoulders and anterior part of back, pale reddish brown, more or less grizzled with silvery grey; rest of back, sides, outer parts of extremities, and tail, ashy brown; the colour darkest along the middle of the back, angles of mouth, throat, breast, belly, inner sides of extremities, and an oblique short stripe on each side of neck, white or ashy-white; sides of face, and space around eyes black. Length from nose to base of tail ten inches and a half, length of tail nine inches.

Inhabits Madagascar.

** Mr. Verreaux has lately been singularly fortunate in procuring a fine specimen of the Cheirogaleus Medius of Geoffroy, and to him I am indebted for the means of indicating the various characters of the Genus.

Cheirogaleus major, Geoff. Colour darkish brown, particularly towards the centre of the face. Length eleven inches.—*Geoffroy.*

Inhabits Madagascar.

Ann. du Museum, tom xix. *p.* 172.

Cheirogaleus minor, Geoff. Colour lightish; a black circle round the eyes. Length seven inches. *Geoffroy.*

Ann. du Museum, tom xix. *p.* 172.

Cheirogaleus Commersonii, Vigors and Horsfield. Hairs of the body fuscous at the base, brownish red in the centre, and black at the extremity. The red prevails along the ridge of the back and on the base of the tail. The ears are clothed with hairs at the base, inside and outside, their margins are naked; the extremity of the toes and nails are black. The length from the forehead to the root of the tail is thirteen inches and a half; of the tail seventeen inches: the height from the tip of the shoulder to the wrist seven; the length of the fore hand, from the wrist to the end of the middle nail, is two inches and three quarters; of the hind hand, similarly measured, three inches and a half. The hairs on the forehead of this animal diverge in the centre, leaving a white mark over each eye, while their extremities being black form a dark line on each side, which runs backwards gradually widening to the hind head.

Obs. This animal, though it can no longer be viewed as a species of the Genus Cheirogaleus, is probably of African origin, and on that account I have entered it here. Messrs. Vigors and Horsfield, who describe it, observe:*—"The incisor teeth are four in number in each jaw, extremely regular; those of the upper jaw are unusually strong, and nearly cylindrical. The nails do not agree with those of M. Commerson's figures; they more resemble those of the *monkeys*." It will probably be found to form the type of a new genus.

Order CHEIROPTERA.

Fingers of the anterior extremities connected by a membrane which spreads from the anterior to the posterior extremities, and in many of the species also connects the latter to each other, forming altogether an apparatus more or less effective for flight. Incisive teeth various in number; canines more or less strong; cheek-teeth, in general, having their crowns furnished with several acute points; but in the first genus a single regular furrow or indentation passes along the whole series; both sides of each tooth approaching the figure of the transverse section of a cone, a little convex, notched on the upper edge from right to left. Mammæ, in general two, pectoral.

* *Zoological Journal, vol.* ii. *p.* 111.

Fam. VESPERTILIONIDÆ.

Fingers of the hands excessively elongated and supporting very fine membranes, thereby enabling the animal to keep up a continued and rapid flight; the thumb separate but not opposable.

Genus Pteropus. *Brisson.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$,—34. *Incisors conical; molars with the crown truncated obliquely, and marked with a longitudinal furrow; head long and subconical; ears simple, without auricles; no crest or nasal appendage; tail short or none; interfemoral membrane sloped off.—An additional phalanx and nail on the index finger of each wing; tongue papillous.*

* *Without a tail.*

Pteropus Edwardii. (Edward's Rousette.) Upper parts of head, upper and lateral parts of neck, and anterior part of back bright reddish yellow, here and there tinted with ferruginous; rest of back brownish black, each hair being blackish towards its base and brownish towards the tip. Face, sides of head, and part of throat, inclined to black; breast reddish yellow or maronne colour; the bases of the hairs black; belly dull reddish yellow, with the bases of the hairs nearly black; ears and wing membranes black. Length from nose to extremity of back twelve inches, expanse of wings forty-five inches.

Inhabits Madagascar.

Vespertilio vamprus. Lin. Great Bat of Madagascar. Edward's *Nat. Hist. of Birds, fig.* 180.

Pteropus vulgaris. Geoffroy. (Common Rousette.) Head and vent pale ferruginous or reddish yellow; neck, anterior part of back, breast, and belly deep reddish brown; centre of back the same colour, only paler; sides of back dull tawny or pale reddish yellow; ears and muzzle black; wing membranes brownish. Incisors of upper jaw placed at equal distances from each other. Length from nose to hinder part of back twelve inches, expanse of wings forty inches.

Inhabits Mauritius and Bourbon.

Vespertilio Ingens, Clus. *Exotic Tab. p.* 94. Vespertilio Vamprus, Lin. Chein volant, Daub. Rousettè, Brisson, *Reg. Anim.* 216. Buff.

Pteropus rubricollis, Geoff. (Red-necked Rousette.) Neck orange or red coloured; all the other parts of the body greyish brown or greyish black; thighs reddish white; ears short and concealed in the fur. Incisors of the upper jaw approximate, the middle ones contiguous; those of the lower in pairs.

Length from nose to hinder part of back about eight inches, expanse of wings two feet.

Inhabits Mauritius and Bourbon.

Pteropus fuscus, Briss. *Reg. Anim. p.* 217. Rougette, Buff.

** *With tails.*

Pteropus Ægyptiacus, Geoff. (Egyptian Rousette.) Fur woolly, and of a greyish brown colour, palest beneath; head shorter and broader than in the others of this division. Incisor teeth small, slender, and regularly placed. Length five inches, expanse of wings twenty inches.

Inhabits Egypt,—found by Geoffroy in the Pyramids.

Geoffroy. *Mem. de l'Institut d' Egypte*, and *Ann. Mus. t.* xv. *p.* 96.

Pteropus Leachii. (Leach's Rousette.) Above dusky brown or greyish brown; some specimens with pale cinnamon coloured variegations particularly about the neck; beneath, a dull smoke grey with a faint tawny tint: throat in some pale rufous or dull tawny; fur of the neck considerably longer than that of the body and extremities; muzzle and ears black; the latter nearly half the length of the head, and rounded at the tips; wing membranes blackish brown with several partial longitudinal veins on the inside of the fourth finger. Incisor teeth regular. Length of head an inch and three quarters; of body three inches and three quarters; of tail three quarters of an inch; expanse of wings eighteen inches.

Inhabits South Africa.—Found in gardens about Cape Town during the summer nights when the fruit is ripe.

Zoological Journal, vol. ii. *p.* 433. 1829. Pteropus Hottentotus, Tem. Smuts. *Dissert. Zool. exhib. enum. Mam. Cap. p.* 3. 1832.

Genus Nyctinomus. *Geoffroy.*

Incisors $\frac{2}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{4}{5}$ $\frac{4}{5}$,—28. *Upper incisors conical and contiguous, inferior ones very small; molars with pointed tubercles; nose flat, on a level with the lips, which are deeply cleft and wrinkled; ears large, united and lying over the face; auricle exterior; tail long and extending beyond the interfemoral membrane; wings large; thumb very short; index finger with only one phalanx; hinder feet covered with long hair.*

Nyctinomus Ægyptiacus. Geoffroy. (Egyptian Nyctinome.) Fur red above, brown beneath; tail slender, and half of it enveloped by the interfemoral membrane, which is destitute of muscular bands. Body about three inches long.

Inhabits Egypt.

Nyctinome d'Egypte, Geoff. *Mem. de l' Institut de l' Egypte Hist. Nat, t.* ii. *p.* 28, *pl.* 2, *No.* 2.

Nyctinomus acetabulosus, Desm. (Port Louis Nyctinome.) Colour brown-black; a bare spot on each side of the breast-bone; interfemoral membrane enveloping two-thirds of the tail; hair of the hinder feet very long. Smaller than the last species.

Inhabits Mauritius.

Ency. Method. Art. Mammalogie, sp. 263. Vespertilio acetabulosus, Herman, *Obs. Zool. p.* 19. Nyctinomus Mauritianus, Geoff. *Egypt. Hist. Nat.* ii. 130. Horsfield's *Java,* No. 5.

Nyctinomus Condylurus, (Knob-tailed Nyctinome). Fur very short and silky; above the surface colour is brown, beneath dull tawny white, verging upon dull brown on the sides; ears black and rounded at tips, each with a narrow stripe of fur on its outer surface, extending from the base almost to the circumference; lips with four or five deep furrows; wing membranes blackish brown; interfemoral membrane enveloping more than half of the tail, above it is thinly covered with short fur towards its base and below till near its posterior margin tail enlarged and wrinkled at the point. Length from nose to base of tail about three inches, the latter an inch and a half. —When the fur is reversed the hairs of the back and sides are found to be tawny towards their bases; those of the middle of the body beneath dull brown.

Inhabits South Africa,—about Port Natal.

Nyctinomus dubius. (*Caffer Nictinome.*) Fur rather long; above the surface colour is a dull deep brown, beneath a light tawny brown inclined on the sides to blackish brown. Ears brownish black and pointed; wing membranes dull black with a faint brownish tint; interfemoral membrane enveloping nearly two-thirds of the tail, the last third very slender and pointed; hairs on the feet dull white; furrows of upper lip very indistinct. Length from nose to base of tail about two inches, of tail an inch and a half.—On the back, each of the hairs is tawny white towards its base; beneath towards the middle of the body, tawny white throughout; on sides tawny white towards the base.

Inhabits South Africa,—between the Cape Colony and Natal.

Genus Megaderma. *Geoffroy.*

Incisors $\frac{0}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{4}{5}$ $\frac{4}{5}$,—26. *Superior canines triangular, each with a process behind, the inferior ones bent backwards; the first superior molar compressed and ending in a long slender point, the others crowned with many sharp tubercles; the inferior molars compressed, the first simple compressed, and with a single point; the others longer, uneven, and each*

crowned with four points. Ears very large and united upon the forehead; auricles much developed. Three appendages to the nose, one vertical, one horizontal or foliaceous, and the third shaped like a horse-shoe; no tail; interfemoral membrane truncated; wings very large, with the third finger without the distal phalanx.

Megaderma frons. Colour fine grey with some yellowish tints; nasal leaf oval, half the length of the ears. Nearly three inches long.

Inhabits Senegal. *Adanson.*

La Feuille, Daub. *Mem. de l' Academie des Sciences An.* 1749. Megaderma frons. Geoff. *Ann. Mus.* xv. 192.

Genus Rhinolophus. *Geoffroy.*

Incisors $\frac{2}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$—30. *Superior incisors very small and not permanent; inferior bilobed; molars crowned with sharp points; nose furnished with a crest shaped like a horse-shoe and surmounted with a leaf; ears distinct; interfemoral membrane large; tail long, and entirely enveloped. Two pectoral mammæ, and two warts on the pubis having the appearance of mammæ, but without lactiferous glands.*

Rhinolophus tridens, Geoff. (Trident Rhinoloph.) Nasal appendage simple, erect, and terminated by three points; body about two inches long; expanse of wings nearly nine inches.

Inhabits Egypt.

Geoff. *Disc. de l' Egypte, tom* ii. *pl.* 2. and *Ann. Mus.* xx. 260.

Rhinolophus Commersonii, Geoff. (Commerson's Rhinoloph.) Nasal leaf simple, the terminal margin rounded; no pouch on the forehead; tail only half the length of the legs. Length between three and four inches.

Inhabits Madagascar,—near Fort Dauphin.

Rhinolophus clivosus, Rupell. The surface colour above is an indistinct lightish brown, grey brown, or tawny brown; beneath reddish white or a pale grey brown: the hairs on the upper part, with the exception of their tips, are reddish white. Ears nearly the length of the head, broad at their bases and tapering to their points, which are acute; anterior and posterior surfaces towards bases of inner margins, thinly covered with short fur; towards outer margins marked by several short transverse wrinkles or muscular bands; auricular appendages large and semicircular; nasal leaf single and spear-shaped; between the nostrils, towards the centre of the horse-shoe membrane, a funnel-shaped cavity, and above and connected with it, an erect somewhat three-sided crest. Wing and interfemoral membranes blackish brown; sides of head and upper lip

covered with a dense short fur intermixed with some long fine hairs. Length from nose to base of tail three inches and a quarter; of tail an inch and a quarter; expanse of wings about thirteen inches.

Inhabits Mohila and South Africa,—common near CapeTown.

Rhinolophus Capensis, Licht. *Verzeichn der Doubl. p.* 4. Rhinolophus Geoffroyii, Smith, *Zool. Journ. vol.* ii. *p.* 433.

Genus Nycteris. *Geoffroy.*

Incisors $\frac{4}{8}$. *canines* $\frac{1}{1}$, *molars* $\frac{4}{4}$—30. *Superior incisors very small, contiguous, and bilobed; inferior trilobed: molars crowned with pointed tubercles; nostrils covered, each by a moveable operculum; forehead with a deep longitudinal groove; interfemoral membrane large, and including the tail, which is terminated in the form of the letter* T.

Nycteris Thebaica. (Geoffroy's Nycteris.) The surface colour of the back of the head and neck tawny or pale ferruginous, of the sides of the neck bright ferruginous, of the back a clear or a dull brown, and of the under parts of the neck and body a fawn or a dull greyish white: the bases of the hairs of the head and neck dark reddish brown, of those of the back dark dull brown, and of those of the under parts dark brown or blackish. Ears very long and broad, dark blackish brown, veined longitudinally, and both surfaces with a very thin sprinkling of fine short whitish hairs; tragus spiral and with a tuft of whitish hair on its point. Four membranaceous processes on the face in addition to those lying over the nostrils, viz. one immediately before the inner edge of the base of each ear, and another about half way between that and the nostril; all of them concealed by fur; a bare spot on the chin, shaped somewhat like the letter V, and on its anterior edge a small warty excrescence; wing and interfemoral membranes brown. Length from nose to base of tail three inches; of tail two inches; of ears nearly an inch; expanse of wings eleven inches.

Inhabits Egypt and South Africa.

Geoffroy's *Egypt, tom* ii. *pl.* 1. *fig.* 2, *and skull f.* 4, *f.* 111. *Ann. du Mus. tom* xx. *p.* 20. Nycteris, Geoffroyii, Desm. *Mam.* 127. Nycteris affinis, Smith, *Zoological Journal, vol.* ii. *p.* 433. Nycteris affinis, *o. c. (junior).*

Obs. When specimens from the Cape and Egypt are accurately compared together, I am inclined to think they will be found to be of different species.

Genus Rhinopoma. *Geoffroy.*

Incisors $\frac{2}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$,—28. *Nose long, truncated and surmounted by a small leaf, nostrils operculated; forehead*

concave; ears large, united, and lying on the face; interfemoral membrane narrow and truncated; tail long, enveloped only at its base.

Rhinopoma microphylla, Desm. (Small-leaved Rhinopome.) Fur ash coloured; tail very long and slender; nostrils with a valve as in the Seal. Length two inches; expanse of wings seven inches.

Inhabits Egypt.—Found in the pyramids.

Vespertilio microphyllus Brunnich, *Description of the Copenhagen Museum.* Chauve Souris d' Egypte Belon *de la nature des Oiscaux, book* ii. *ch.* 19.

Genus Taphozous. *Geoffroy.*

Incisors $\frac{0}{4}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{4}{5}$ $\frac{4}{5}$,—26. *Muzzle with a furrow but no laminous appendage; upper-lip very thick; ears moderate, separated from each other; no external lesser ears; interfemoral membrane large; tail not so long as the membrane, and exerted on its upper side.*

Taphozous Senegalensis, Geoff. (Taphozous Bat of Senegal.) Brown above, mixed with ash colour on the under parts. Length two inches and a half.

Inhabits Senegal.

Loret Volant, Daub. *Mem. de l' Acad. des Scien. Année*, 1759.

Taphozous Mauritianus, Geoff. (Taphozous Bat of Mauritius.) Brownish or chesnut above, reddish beneath; auricle terminated by a sinuous border; nose more pointed than in the preceding; tail shorter than the thighs. Length three inches and a half; expanse of wings above nine inches.

Inhabits Mauritius.

Taphozous perforatus, Geoff. (Perforated Taphozous Bat.) Fur grey-red above, ash coloured beneath, with the base of each hair white; inner ears in the form of a hatchet, and terminated by a rounded edge.

Inhabits Egypt.—Found in the ancient buildings.

Obs. "M. Desmarest thinks it probable that this and the T. Senegalensis are the same."

Genus Vespertilio. *Linnæus.*

Incisors $\frac{4}{6}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{4}{5}$ $\frac{4}{5}$, *or* $\frac{5}{6}$ $\frac{5}{6}$,—32 *or* 36.—*Superior incisors separated in pairs, cylindrical and pointed; inferior approximate with a bilobed edge, directed forwards; anterior molars simply conical, posterior crowned with points; nose simple, without membraneous appendages, ridge, or furrow; ears*

lateral and distinct; internal ear visible; index finger with one phalanx, the middle with three, the ring and little fingers with two; tail not exceeding the interfemoral membrane; sebaceous glands under the skin of the face.

Vespertilio pipistrellus, Lin. (The Pipistrelle.) Fur long, above brownish black, beneath brownish yellow; ears oval-triangular, shorter than the head; the tip of each inner ear rounded. Length of body one inch; tail nearly as long; expanse of wings about seven inches. The African specimens are slightly ash coloured.

Inhabits Egypt.

V. Le Pipistrelle, Daub. *Mem. de l' Acad. &c.* 1759. The Pipistrelle, Pen. *Quad.* ii. 318. Geoff. *Ann. Mus* viii. *pl.* 47 and 48. *Descrip. d' Egypte, fig.* 1. *f.* 3. *Skull, fig.* 4. *f.* 585.

Vespertilio nigrita, Gmel. (Senegal Bat.) Fur above fawn coloured, beneath ashy brown; length of ears one-third of that of the head; muzzle large; lips long; the extremity of the tail free and projecting beyond the interfemoral membrane. Length of body about three inches; expanse of wings about fifteen.

Inhabits Senegal. *Adanson.*

Marmotte volante, Daub. *Mem. de l' Acad.* 1759. Chauve-souris Etrangere, Buff. *t.* x. Senegal Bat, Pen. *Quad.* 281. *Ann. Mus. t.* viii. *p.* 47.

Vespertilio Borbonicus, Geoff. (Bourbon Bat.) Fur above reddish, beneath whitish, with the tips of the hairs reddish; ears oval-triangular, and half as long as the head; head short and broad; muzzle tumid; nose prominent. Length nearly three inches.

Inhabits Bourbon.

Vespertilio Temminckii, Rupell. (Temmincks Bat.) Head and back dark mouse grey with a brownish shade, under parts of body shining snow white; ears round; posterior surface naked and brown, anterior surface covered with fine brown hair; tragus leaf-shaped, broad and rounded towards the tip; fur tufted behind the muzzle; wing membranes brown; the hinder portion of interfemoral membrane a little hairy. Length from nose to base of tail one inch and ten lines, of tail one inch and two lines; expanse of wings seven inches. The colours in the male, female, and young, are the same.

Inhabits Nubia,—about Dongola.

Vespertilio Capensis, Smith. (Cape Bat.) Above the surface colour is a light greenish or pale tawny brown; beneath tawny or tawny white with shades of light brown; the middle and lower portions of each hair on the back a deep clear black; the

lower portion of each beneath a dull black. Ears naked and brownish, broad at the base, and emarginate on the outer side; the tips slightly elongated and acutely rounded; tragus broad, falciform, and slightly inclined inwards toward the point; muzzle and sides of face black with a slight sprinkling of black hair, the former cleft in front: nostrils opening to the sides. Wing membranes blackish brown; interfemoral membrane towards base, both above and below, with a thin sprinkling of short hair, above it is most abundant in the course of the tail. Length from nose to base of tail two inches and a quarter; of tail one inch; expanse of wings eight inches.

Inhabits South Africa.

Zoological Journal, vol. ii. *p.* 435.

Vespertilio Hottentota, Smith. (Hottentot Bat.) Above a dull indistinct dark brown, sometimes nearly black; beneath the surface colour is a sort of pale tawny brown or tawny white, lighter towards the pubis; the middle and basilar portions of the hair brownish black. Ears about half the length of the head, black and acutely rounded at their tips, the inner surface bare, the outer hairy towards the base; tragus linear tapering, and with a rounded point; muzzle covered with dense fur till near its point; wing membranes brownish black; interfemoral membrane with a sprinkling of fine short brownish fur for half its length above; claws pale flesh-coloured. Length from nose to base of tail two inches and a half, of tail two inches; expanse of wings twelve inches.

Inhabits South Africa,—Uitenhage and Albany.

Vespertilio Dinganii, Smith. (Dingan's Bat.) Fur long and silky; above, the surface colour is dull olive-green, beneath a pale greenish yellow; head short and broad; nostrils prominent; ears blackish brown, and slightly pointed; tragus long, falciform, and tapering towards the tip, which is rounded; auricular appendage semicircular, very distinct, and in a measure separated from the anterior and outer margin of the auricle, inside of the latter with a thin sprinkling of short olive-green hair; wing membranes black; interfemoral membrane pointed, with part of the last joint of the tail protruding beyond it; claws pale greenish yellow; lower incisors placed obliquely across the jaw. Length from nose to base of tail three inches and a half; length of tail two inches; expanse of wings about twelve inches.—Above the hairs are yellowish green, towards their bases below they are of one colour throughout.

Inhabits South Africa,—between Natal and Delagoa Bay.

Vespertilio Natalensis, Smith. (Natal Bat.) Fur soft and of moderate length, the surface colour above deep clear brown; beneath light brown, inclining to tawny brown; the basilar

half of all the hairs clear black. Ears naked, broad towards base, and slightly emarginate on the outer side, the tips rounded; tragus narrow, straight, and rounded at the point; muzzle and upper lip black, with a thin sprinkling of short black hair, nostrils opening directly in front; no appearance of a cleft in the fore part of the upper lip; wing and interfemoral membranes black. Length from nose to base of tail two inches, of tail an inch and a quarter; expanse of wings eight inches and a half.

Inhabits South Africa,—towards Natal.

Vespertilio tricolor, Temm. (Three-coloured Bat.) Fur soft, above three-coloured, viz. each hair brownish black at the base, yellowish white in the middle, and reddish at the apex; beneath two-coloured, dark brown at the base, and yellowish white elsewhere: the lateral parts of the neck and breast tinged with a clear red; membranes pale brown. Length from nose to apex of tail three inches and ten lines; expanse of wings twelve inches.

Inhabits South Africa.

Smuts *Diss. Inaug. exhib. enumer. Mamm. Capensis, p.* 106.

Vespertilio epichrysus, Temm. Fur dense, short, and smooth; above the hairs are brown at their tips, yellowish in the middle and white at their bases; beneath brown at their bases and a clear flesh colour at their tips. Ears of moderate length, erect, acuminated, and emarginate on the outer edge; straight and lanceform; muzzle slightly obtuse; tail very long; nostrils approximate.

Inhabits South Africa.

Smuts *Op. cit. folio* 106.

Vespertilio platycephalus, Temm. Fur dense, woolly, and of moderate length; above the surface colour is brownish red, and each hair towards its base is brownish black; beneath a sort of whitish brown; on the region of the pubis whitish; half of the upper surface of the interfemoral membrane hairy, the under surface naked. Head much depressed; mouth large; half of the outer surface of ears hairy. Length of body three inches and one line; of tail one inch; expanse of wings nine inches.

Inhabits South Africa.

Smuts *op. cit. folio* 107.

Obs. The three last described species appear to me to differ from any I have found in South Africa.

Order FERÆ. *Linnæus.*

Teeth of three sorts, incisors, canines, and cheek teeth, more or less of a trenchant or carnivorous character; four extremities proper for walking; mammæ abdominal or pectoral, varying in number; stomach simple membraneous; intestines short.

Fam. INSECTIVORA. *Cuvier.*

Hinder feet always with five, and fore feet generally with five toes; soles of the feet bearing upon the ground; cheek teeth crowned with pointed tubercles; incisors variable in number; body covered with hair or prickles.

Genus Erinaceus. *Linnæus.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$,—34. *Intermediate incisors, above separate, long, cylindrical, and directed forwards; canines shorter than the molars. Body thick, covered above with prickles and beneath with coarse hair; muzzle pointed; ears medium size or very short, and rounded; toes armed with strong nails; tail short or none; mammæ ten, six pectoral and four ventral, no cæcum; clavicles complete: capable of rolling itself into a spherical shape.*

Erinaceus auritus, Geoffroy. (Egyptian Hedgehog.) Above covered with slender brown spines, each with two rings, one whitish near its base, and the other yellowish towards the tip; the legs and belly covered with soft white fur. Ears large, oval, open, and naked, with softish white hair on the inner sides and an edging of brown; eyes bluish; tail short, nearly naked, and of a yellowish white colour; legs longer and more slender than those of the common hedgehog; muzzle furnished with four rows of whiskers; nostrils denticulated like the crest of a cock. A little smaller than the hedgehog of Europe.

Inhabits Egypt. *Geoffroy.*—Also, Asiatic Russia.

Erinaceus auritus, Pallas. *Nov. Com. Petrop, tom* xiv. Herisson *d'Egypte*, Geoff. *Egyp.* Schreb. *tab.* 163. Shaw, *Zool. vol.* i. *p.* 2. *p.* 547.

Erinaceus frontalis, Smith. (Cape Hedgehog.) Muzzle short and black; ears and tail short; spines numerous and about half an inch long, of a white colour, variegated with black towards their bases; forehead white, and from thence to the origin of the fore legs extends a broad white band, immediately in front of the spinous covering of back; chin and under parts covered with deep black hair. Length about eight inches.

Inhabits South Africa.

Specimens of this species are occasionally found in the northern parts of the district of Graaff-Reinet, but they are much more abundant in the

country towards Latakoo, where they are sometimes seen alongside of, or even upon the high roads.—*South African Quarterly Journal, No. 5, Oct.* 1831.

Genus Sorex. *Linnæus.*

Incisors $\frac{3}{2}$ *spurious canines or lateral incisors* $\frac{3}{2}\,\frac{3}{2}$ *or* $\frac{1}{2}\,\frac{1}{2}$, *molars* $\frac{4}{3}\,\frac{4}{3}$,—28 *or* 30. *Upper incisors indented at their bases; lower horizontal towards their bases, turned up towards their tips; spurious canines conical, small and shorter than the molars, the latter crowned with points. Head elongated; nose prolonged and moveable; ears short and rounded; eyes small but perceptible; tail varying in length, round, compressed, or four-sided; feet with five toes; nails short, curved, and pointed; sebaceous glands on the flanks.*

Sorex Capensis, Geoffroy. (Cape Shrew.) Fur short and soft; the surface colour of the upper parts of the head, of the back, and dorsal half of the sides, is an uniform yellowish brown, which varies in depth of tint in different individuals; the under parts ashy grey or grey-white: the bases of the hairs above dark slate coloured, of those beneath light slate coloured. Muzzle elongated and slender, two-lobed at the tip; whiskers long, particularly towards the angles of the mouth; ears large, naked, and of a pale brownish colour; inferior margin of each, together with the oblique septum upon the anterior surface, fringed with some long white hairs. Tail cylindrical, and above covered with a short reddish brown fur, intermixed with some long whitish hairs; beneath with ashy white fur. Length from nose to base of tail five inches and a half; tail two inches.

Inhabits South Africa.

Sorex flavescens, Geoff. *Mem. du Mus. d' Histoire Naturelle. Huitieme annee. Dieuxieme cahier.* Scheer Muis of the *Cape Colonists.*

Sorex Capensoides, Smith. Fur moderately long and soft; above the surface colour is brownish, finely sprinkled with white; beneath greyish or reddish white; all the hairs towards their bases dark slate coloured: tail covered with a fine short fur, which is intermixed, particularly on the sides, with a number of long fine hairs. Muzzle elongated, the apex two-lobed; nostrils directed outwards; ears large, bare, and projecting beyond the fur; teeth dull white. Length from nose to base of tail three inches; tail an inch and three quarters.

Inhabits South Africa,—near Cape Town.

Obs. The specimen from which the description has been drawn up, appears to be an *adult*, but as it is not in a good state of preservation it is possible that it may be the *Sorex Capensis* in a different age. The tail, however, is longer in proportion to the body than that of the Cape Shrew.

Sorex Indicus, Geoff. (Indian Shrew.) Fur very short grey-brown, above tinted with reddish, in consequence of the tip of each hair being of that colour Tail round and reddish brown. Length of body five inches and two lines, of tail one inch and six lines. *Geoffroy.*

Inhabits Mauritius and India.

Ann. du Mus. tom 1 *et* 17, *p.* 183. Geoff. *Mem. du Mus. d' Histoire Naturelle. Huitieme annee.—Deuxieme cahier, p.*133.

Obs. It has not yet been satisfactorily ascertained whether *S. Indicus* and *S. Capensis* be identical or not. I have only had an opportunity of examining one specimen of the former, which was sent me from Mauritius, and it appears not to be full grown. The tail was much longer in proportion to the body in it than in the Cape Shrew.

Sorex varius, Smuts. (Variegated Shrew.) Fur soft and rather longer than that of the last; the surface colour of the upper parts of the head, of the back, and of the sides, is variegated or grizzled pale yellowish brown, obscure grey-white and bluish black; beneath it is reddish white: the bases of all the hairs, both above and beneath, dark slate-coloured. Muzzle moderate; ears scarcely projecting beyond the fur; both their anterior and posterior surfaces with a thin covering of yellowish brown hair; whiskers long; tail cylindrical, and covered with short reddish white hairs, of equal lengths; nails long, and nearly colourless. Length from nose to base of tail four inches, the tail an inch and a half.—*Dissert. Zool. f.* 108.

Inhabits South Africa:—Wynberg, Swellendam, &c.

Sorex giganteus, Geoffroy. Above ash coloured with a tint of reddish, beneath a pure ash colour; ears large, not concealed in the fur; tail rounded. Length from nose to base of tail about five inches and a half, tail three inches.

Inhabits India.

Mummies, supposed of this species, were discovered in tombs in Egypt, by *Olivier* and *Passalacqua.*

Sorex religiosus, (Sacred Shrew.) Colour greyish like that of the common mouse; ears very large; tail four-sided, angles prominent; thumb very short. Length from nose to base of tail about two inches and a half; tail about the length of the body.

Found in the catacombs of Thebes. *Passalacqua.*

Obs. As far as we know, the *Sorex giganteus* does not inhabit any part of Africa, and the *Sorex religiosus* has not yet been identified with any existing species. Another embalmed shrew, from the same locality, has been examined by M. Geoffroy, and has been considered by him as constituting a third species. In its figure and proportions it resembles very much the *Sorex araneus* or common shrew of Europe; and he remarks that he has in vain sought for a character to distinguish them precisely from each other. He is, however, not inclined to consider them as identical.*

* Memoires du Mus. d'Histoire Naturelle. Huit. annee Deux. cahier.

Genus Macroscelides. *Smith.*

Incisors $\frac{2}{2}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{5}$—40. *Upper jaw—incisors separated, compressed, and pointed; canines short, separate, and more or less two-pointed: the first and second molars crowned with five points, the third and fourth with four, the fifth somewhat triangular and three-pointed. Under jaw—incisors slanting and with cutting edges; canines contiguous, the first three-pointed, the others with two points; the first and second molars compressed, and three-pointed; the third, fourth, and fifth four-pointed: muzzle narrow, terminating in a long subcylindrical proboscis, having the nostrils at its apex; eyes moderate; ears large and rounded; tail rather long, scaly annulated, and thinly sprinkled with short hair; feet plantigrade, five-toed; hinder extremities very long.*

Macroscelides typicus, Smith. (Cape Elephant Mouse.) Fur long and soft; the surface colour of the upper and lateral parts of the head pale reddish brown, sprinkled with white; of the back a pale brown clouded with black; of the sides pale grey-white or red-white sprinkled with black; beneath it is a clear white: legs with a covering of short white hair; ears large, with a thin sprinkling of short whitish hair on both surfaces; proboscis white; whiskers long, some of the hairs white, the rest black; tail thinly covered with blackish hairs above, and with white ones beneath. Length from nostrils to root of tail four inches and three quarters; length of tail three inches and a quarter.

Inhabits South Africa.

Sorex Araneus Maximus Petiver, *t.* xxiii. *fig.* 9. M. typus, Smith. *Zoological Journal, v.* ii. *p.* 436.

Macroscelides rupestris, Smith. (Namaqua Elephant Mouse.) Fur long and soft; the surface colour of the upper parts of the head pale tawny, of the back and sides of the neck bright tawny, inclined to pale rufous; of the back pale yellowish brown, sprinkled with black; on the sides it is pale reddish white, and beneath pure clear white: the bases of all the hairs a dark slate-colour. Ears with a thin sprinkling of very short hair, tawny without and white within; whiskers long, and the hairs principally black; proboscis reddish white; legs covered with short reddish white hair; tail variegated with black, with tawny, and with white, short, hairs. Length from nostrils to base of tail six inches; length of tail four inches.

Inhabits South Africa,—rocky mountains of Namaqualand.

South African Quarterly Journal, No. 5, p. 10. *Oct.* 1831.

The M. *rupestris* is rather larger than the M. *typicus*, and is at once distinguished from it by the pale rufous patch on the back of the neck. The former is met with upon rocky mountains, where it lives under the loose stones; the latter occurs only in low flat districts, and lives in holes in the ground.

(*To be continued.*)

SOUTH AFRICAN

QUARTERLY JOURNAL.

SECOND SERIES.

No. 1. OCTOBER—DECEMBER, 1833. Part 3.

An Account of the Amakosae, a tribe of Caffers adjoining the Eastern Boundary of the Cape Colony. By N. Morgan, Esq. Assistant Staff-Surgeon.—(Abridged.)

[Concluded from page 48.]

These people had neither flint nor steel before their intercourse with the Europeans, and their manner of kindling a flame was by means of the friction of two sticks, one of them was pointed at the end, and the other had a small hollow made in the side to receive the point of the former. They held firmly the stick that had the cavity in the side on the ground with their feet, and placed the point of the other in the cavity, then turned it with their hands very smartly, pressing down firmly at the same time, after the manner of milling chocolate; a lighted dust is produced by the friction, which is collected in some dry grass, and woven about in the air until a flame is produced.

No religion or form of worship exists among them, but they appear to have some idea of the existence of a Supreme Being who takes cognizance of their actions, and that he is not pleased with evil ones. But whether he punishes or rewards in a future state, or whether there exists such a state, I think they have a very imperfect knowledge; that they have some is most likely, for they have an opinion that the spirits of departed persons are for a long time after death wandering about their former dwellings, and are at times visible. Among no people in the world are ghost stories more implicitly believed than among them.

They do not worship a Supreme Being in any form, and what idea they have of one appears to be that he is the dispenser of evil to them. Several of their customs appear to be the vestiges of a ceremonial worship for the purpose of averting evil or appeasing the wrath of a Being who is actually afflicting them. They appear now to personify in their mind every particular ill that comes among them, and to that evil, as to a person, make their offerings. Thus when any unusual

mortality comes among the cattle of a kraal, they slay the fattest of their flock, and consume it with fire in the very kraal in which the diseased cattle are usually folded: if the evil is small, or only anticipated, they consume a bundle of other substances prepared for this purpose. If any drift across the rivers has proved fatal to the lives of either men or cattle, particularly of the cattle, they, to avert the recurrence of similar accidents, slay and cut up a beast, and throw the pieces into the stream at the place feared. This ceremony was often performed at Caffer Drift on the Fish River, it being a dangerous passage, and one formerly much used by them in their predatory excursions into the colony.

The following customs, however, appear to be founded upon a former practice of making thank offerings to a Beneficent Deity, viz.:

The slaughter of cattle at the birth of a child, and at the first appearance abroad of a lying-in woman,—at the circumcision of their boys,—and at the age of pubity of their girls;—also at their marriages, and at their great feasts.

Upon a review of their customs in general, I think we may see evidently the remains of worship and sacrifice to a Supreme Being; and I am led to think that these people are the descendants of some people to the east, and that they have gradually lost their originally possessed knowledge and fallen to their present low estate during their progressive emigrations to this country.

The following is some account of the letters used, and the klick and sounds as described by the Missionaries.

The Caffrarian alphabet contains twenty-five letters, which are arranged and named as follows, viz.:

Roman.		Name.	Roman.		Name.
A	a	a	O	o	o
B	b	ib	P	p	ip
C	c	ce	Q	q	gu
D	d	id	R	r	ru
E	e	e-e	S	s	es
F	f	ef	T	t	it
G	g	ig	U	u	u-u
H	h	ih	V	v	iv
I	i	i-i	W	w	we
K	k	ik	X	x	xi
L	l	el	Y	y	ye
M	m	em	Z	z	iz
N	n	en			

Remark. The i of b, p, t, g, k, v, z, and h, is short; e of f, s, l, m, and n, is short; e of w, y, and c, is sounded as the English slender a; u of q and r, is long; i of x is long.

The only diphthongal sound in Caffrarian is au, which is the aw or ow of the English words howl and hour. Examples: paula, gaula, idauwa, isitauwa, kauka, gauka, laula, hlaula.

Of the sound of the letters:—

1st. Of the *Vowels*:—A, a, has the open sound of a, in the English; as in fancy, glass. Examples: bala, imbabala, palaza, afafa, ikaka.

E, e, has two sounds: one of these is the sound of slender a, in the English; as in make, mane, face. Examples: umenzie, idebe, ibele, izele. The other is the sound of short e, in the English, as in debt, bed, tell. Examples; betela, peta, teta, senga, yenza.

I, i, is long or short; long i has the sound of ea, ee, or ey, in tea, see, key. Examples: idikidiki, ipimpi, isipitipiti, isibibilili. Short i has the sound of i in sin, fin, dim.

I, of the nominal characteristics im and in, and the first of isi and izi, are commonly short. Examples: imbiza, impofu, ingubo, inkomo, isibonda, isihoko, izidanga, izilonda.

O, o, has the sound of o in the English words bone, cone: Ubobo, isibobo, umboko.

U, u, is long or short; long u has the sound of u in rule; or of oo in boot, cool: Justu, ishushu. Short u has the sound of u in dumb, sum, sun. Examples: umti, umga, umqa, numhla, umoxa.

U is short only, but not always, before m, and n, of its own syllable.

[Short i and u should be marked as such.]

2nd. Of the *Consonants*:—B has the sound which it obtains in other languages: Boba, ubibi, ibiba, bumba.

D has one unvaried sound; as death, din, duda, idada, udada, indoda, dada, udade.

F has one unvaried sound, as fee, fat. Faka, ufefe, ufafa, umfondini, umfula.

G has uniformly the sound of g hard in English, as gone, get. Guga, ugaga, igugu.

H has always the same sound, as in him, ham, hint. Hamba, ihobe, uhadi.

K has always the sound of k, or of c hard in English, as keep, kill, can, call.

L has uniformly the liquid soft sound, as in other languages: Lola, lala, ilula.

M has the sound of m, in murmur, monument. (This con-

sonant is sometimes sounded without a vowel, as m'sa for musa, m'na for mine.)

N has the two sounds which it obtains in English; the one as in man, can; the other has the ringing sound like ng, as in rank, sink. The latter sound occurs only when n is followed by g or k of the succeeding syllable: k of the compound sound khl is excepted. (The ringing sound of n is always heard though not written at the end of a word, when the following one begins with g, 'zenziwa [n] guye.)

P is uniform in its sound; as put pull. Pupa, pipa, ipapu, impepo.

S has always the common hissing sound: Snsa, kusasa, umsesane, isela.

T has its usual sound, as tell, tube. Teta, tutu, umteto, tuta, umtati, umtata.

V has one uniform sound, as van, vast, valve, Vula, isivivi, imvo, uvutuvutu.

W has an invariable sound, as winter, weather. Wena, iwawa, wowa, wam.

Y has always the sound of y, in ye, yes. Yiya, yam, iqiya, yeka.

(a and o; when they precede y, seem to have the diphthongal sounds ai and oi; but this is in consequence only of their conjunction with that consonant.)

Z has an uniform sound, as zeal, zone. Zuza, umzuzu, izenzo.

3rd. Of the *Klicks* and *Gutteral.*—These, though appointed to denote certain sounds of the language, rank as consosants.

C denotes the semidental klick. This klick is produced by withdrawing the tongue from a gentle pressure of that organ on the upper incisor teeth and the palate:—Cuca, isicici, isicoco, icacadu. (The sounds which this letter obtains in English, are in Caffrarian represented by k or s.)

Q denotes the palatial klick. This klick is produced by withdrawing the tongue inward and downward from a considerable degree of pressure on the palate by that organ:—Qaqa, iqoqa, uqaqaqa, uqoqoqo, quqa, umququ. (The sound of this letter in other languages, is in Caffrarian represented by k.)

X denotes the linqual klick. This klick is produced in the right side of the mouth by a gentle motion of the edge of the tongue, somewhat analagous to the klicking of some persons when wishing a horse to bestir himself:—Xoxa, isixaxa, xoma, umxoxozi, umxosa, xela. (The sound which this letter usually represents is not in Caffrarian.

R denotes the hard gutteral. This sound is formed at the back part of the mouth, and seemingly by a forcible expression

of the breath while the glottis is considerably contracted:—Irara, ubora. (The rough sound represented by this letter in other languages, is not in Caffrarian.)

4th. Of the *Compound Sounds.*—These are represented by the following combinations of the Consonants.

Dw has the sound of dw in the English words dwarf, dwell. Dwila, indwe, indweza, isidwala. It assumes a, e-e, and i.

Dy has the sound which some Britons express when pronouncing the words due, duty, &c. as if they were written dyuty.

Dyoba, indyungudyungu. It assumes a, e-e-o, and u.

Dzh has the sound of j or g soft in English.

Dzhika, idzhodzo, idzhedzhe, indza. It assumes a, e-e, i, o, and w.

Dzhw, if a in the English word jaw is dropped, and an open a affixed (jwa), an idea of the sound may be obtained:—Dzhwaqa, idzhwabu, isidzhwibi, umdzhwaku. It assumes a, e, and i.

Dyw ranks with the preceding sound, being only so much harder as dy is harder than dzh. It assumes a and i:—Dywaba, idywadi, idywaheli.

Ts has perhaps the exact sound of the Hebrew tsade. Tsala, tsatsa, intso, intsika, intsuntsu. It assumes a, e-e, i, o, & u.

Tw has the sound of tw in the English words twelve, twenty. Twesa, intwana, itwatwa, umtwa, itwecu. It assumes a, ere, i, o, and u.

Tsh has the sound of ch in the English words chin, china, cheek. Tshaya, isitshetshe, tshotsho, tshisha, intshipintshipi, intshivela, intshwabuli. It assumes a, e-e, and i.

Tsw is the sound of ts, with the addition of w, Twsina, itswele.

Ty assumes a, e-e, i, o, u. Tyala, isityebe, intyalo, ityolo.

Tyw assumes a, e, i. Tywila, itywalwa, tywakaza, isitywaka.

Thl assumes a, e, i, o, u. Thlala, inthlebe, isithlele, inthlovu, inthlu, ithlaka, isithla, inthlele, ithlatyani, thlula.

Thlw assumes a, e, i. Inthlwana, thlwengula, umthlwengu.

Gw is perhaps heard in the first syllable of the word guaiacum. Gweba, igwagasi, igwilita, gwega, igwangwa.

Gy assumes a and e. Gyaba, ingyebo, ingyaba.

Gc is the sound of g with the semidental klick attached. Gcina, igcegceya, ingcambu, isigcawu, ingcawgcazelo.

Gcw, Gcwenza, ingcwalisa, ingcwele, ungeweno, igcwizi.

Gq is the sound of g with the palatial klick attached. Igqihwiza, imingqi, ingqele, ingquzugquzu, ingqoqo, gqita, ingqanda, igquma, ingqonqo, igqogqohra.

Gqw is the sound of gq with the addition of w. Gqwizila, igqwihra, igqwalashu. It assumes a, e, i.

Gx is the sound of g with the lingual klick attached. Gxebe, umgxam, ulugxa, gxugxa.

Gxw is the sound of gx with the addition of w. Gxwala, igxweni, igxwaba. It assumes a, e.

Khl is a sound which is harder than hl. Inkhlamo, inkhle, inkhlolko, inkhliziyo. It assumes a, e, i, o, u.

Kw has the sound of qu in queen, quart. Kwela, kwam, ukwekwe, inkwakwa. It assumes a, e, i.

Zw assumes a, e, i. Ilizwe, izwane, umzwazwa.

Sh has the sound of sh in shall, shell. Shenxa, ishushu, umshologu, isheshegu. It assumes e, i, o, u.

Shw assumes a, e, i. Shwila, ishweshwe.

Sw has the sound of sw in swell, swan. Isisweli, umswi, umswimpofu, swabuzela. It assumes a, e, i.

Hl assumes a, e, i, o, u. Hlaba, hleba, hlinza.

Hlw assumes a, e, i. Hlwayela, ihlwempu.

Hw is the sound of wh, in whence or hwence, what or kwat. Umhwahwalala. It assumes a.

Hr represents the soft gutteral, It assumes e, e-e, i, o, u, Hrola, ihruhra, ihrahrawe, ihratahrata.

Hrw assumes a, e, i. Hrwaqa, ihrwanqa.

Lw assumes a, e, i. Lwako, amlwele, umlwimi.

Nhy assumes a, e, i, o. Unhyamnhyeka, inhyobo.

Nhyw assuumes a, e. Nhywebelaqa, inhywagw.

Nw assumes e. Inwele, umnwe, umnweba

Ny assumes a, e-e, i, o, u. Nyuka, unyikinyane.

Nc is the sound of n, with the semidental klick attached. Nceda, umnci, incopo, ncaza.

Ncw assumes a, e-e, i. Ncwaba, ncwela.

Nq is the sound of n, with the palatial klick attached. Nqaba, umnqonqo, nqumla, nqanqateka, isinqe. It assumes a, e-e, i, o, u.

Nqw assumes a, e, i. Nqwema, umnqwaz.

Nx is the sound of n, with the lingual klick attached. Inxanxos, nxama, inximinximi, umnxeba, nxatshike, inxaniwe. It assumes a, e e, i, o, u.

Nxw assumes a, e. Nxwema, inxwahra.

Cw assumes a, e, i. Cwacwaze, icwacwacwa.

Qw assumes a, e, i. Qweqwa, iqwiqwi, qwesha.

Xw assumes a, e, i. Xwila, umxwexwe.

Rw assumes a, e, i. Rwarwa, rwina, rweca.

There are two more sounds known, which would have been added to the above, but the Author was unable to express them by any combination of the letters.

Remarks on the Letters:—1st. No letter is mute, and each preserves the sound ascribed to it in the alphabet.

2d. M is the only consonant which terminates a word; some words when not fully pronounced seem to terminate in z, s, or v; but when fully pronounced, a vowel is heard after each of them, as, amanzi, amasi, inthlovu, umfazi, pezu, umnquzi, umalusi, &c.

3rd. The letters a, e, i, o, u, b, d, g, k, l, m, n, w, and y, are employed as serviles. By means of them the whole business of Flexion, Numbers, Persons, Tenses, &c. is effected. The servile power of d, m, and g, is comparatively very limited.

Of the Division of Syllables:—1st. M and n are the only consonants which terminate a syllable. When m terminates a syllable, the first letter of that which succeeds may be any one of the consonants. N is more limited: when it terminates a syllable, the first consonant of the succeeding one is d, t, g, k, z, q, and x. It does not terminate often before either of the last two, viz. q and x. Example: Iten-qi, in-qo, kon-xa.

2nd. The first letter of a word, if a vowel, and not being joined with m or n, is itself a syllable.

3rd. Every syllable not terminating in m or n, nor consisting of a single vowel, has one of the vowels as its final letter.

Of the Accent of words:—Caffrarian words are accented on the penultimate, as, bo'pa, be'ta, aman'zi, ukaka'nya, and if they receive an increase by inflexion, they draw the accent forward, as, bopele'la, bete'la, ekukanye'ni, emanzi'ni.

In a few exceptions the accent is on the final syllable, as, uma', itenqi', ditenqa'.

I shall for the present close this imperfect sketch of these people. Should I at any future period acquire any further observations respecting their manners, &c. I will again trouble you with their perusal.

Observations on the Circumstances producing Ignition in Charcoal in Atmospheric Temperatures. By Mr. William Hatfield.*

The spontaneous combustion of charcoal under certain circumstances has been long observed, though it has not excited the attention which it merits; nor would it now, perhaps, have possessed much general interest, had it not been for the serious consequences which may result from its occurrence in some

* Abridged from the London and Edinburgh Philosophical Magazine, &c. for July 1833.

situations. As large quantities of charcoal are used in gunpowder manufactories and in other works, its spontaneous combustion in such places would manifestly endanger, not only much property, but a number of lives. The subject is, therefore, worthy of attention; since, if the cause could be assigned, the danger might be averted.

If 20 or 30 cwt. of charcoal, in a state of minute division, be put together in a heap and left undisturbed, spontaneous combustion generally ensues. The fact has been long known;—but no investigation, with the exception of that to which I have referred, has, to my knowledge, been instituted.

Spontaneous combustion does not often take place in what the manufacturers call *round charcoal*; that is to say, in fragments of considerable size; unless when large quantities are laid together, under which circumstances it is not very unusual. In this case the phænomenon is generally ascribed by the makers to the charcoal not having been sufficiently cooled after its production. This reason is, no doubt, sometimes, but not always, correct. On the contrary, I have known charcoal, which has been freely exposed to the atmosphere, when, though closely watched, it presented in the interval no appearance of the kind.

In one case charcoal was loaded in Manchester and conveyed by a cart to a distance of twenty miles. No combustion appeared during the loading, nor could the carter, though he carefully examined, perceive any indication of it, when, at 11 o'clock, he left it for the night. At 5 o'clock on the following morning, however, he was called up to save his cart, which he found on fire and nearly consumed.

This charcoal had been made three days before the accident. Care had been taken that it should be sufficiently cool before it was loaded, as a similar event had previously occurred to the same parties, who ascribed it to the charcoal being too new, when, as they conceived, fire lurked in it unextinguished.

These two instances may, I should think, be accounted for in the following manner:—

When large quantities of charcoal, as in the first example, are laid together, it is evident that the lower parts must be exposed to pressure, and, by the motion of the cart, to friction from the parts above; in this way, therefore, a portion of the charcoal is pulverised, forming a compact mass at the bottom, where it enters into spontaneous combustion.

In the second instance, pressure and friction had still greater influence. The carter, while he was loading, beat down the charcoal with a large hammer, to force it into a smaller compass. Conveyed for twenty miles in a cart, the pieces would rub

against each other, and the finer parts would be shaken to a compact mass; and possibly the friction might, in this case particularly, produce a degree of heat which might promote the ignition.

Before I proceed to an account of my own direct experiments, I will describe here another instance of spontaneous combustion which occurred casually. About 2,000lbs. weight of charcoal were loaded at Cornbrook, in the cart of Messrs. Williamson and Co., powder manufacturers, of Fernelee, near Buxton. The charcoal had been made several days before, and had lain freely exposed to the open air. No indications of combustion could be perceived. After being taken out of the cart at Fernelee, it was left for the night, and the next day finely pulverised as a preparation for making gunpowder. It was then thrown into a heap; and no appearance of a tendency to ignite ensued. This was on the Saturday evening; and on Sunday the building which contained it was observed to be on fire. The fire must have commenced with the charcoal, as every other source of heat was carefully excluded, on account of the gunpowder manufactory.

These, and a number of other accidents which have arisen from the same cause, united with the opportunities which I have possessed as a manufacturer of charcoal, have led me to take particular interest in the subject. And I therefore came to the determination of making, for my own satisfaction, a few experiments, which I shall proceed to describe.

Exp. 1.—120 pounds of charcoal, slightly pulverized, were put into a flour-barrel, and a leaden tube, of an inch and a half in diameter and 14 inches long, inserted in the middle, to hold a thermometer. The temperature of the charcoal when put into the barrel was 60°. In two days the charcoal acquired a temperature of 74°; from that time the temperature gradually diminished until, in two days more, it was reduced again to 60°,—the temperature of the surrounding atmosphere. This charcoal was rather old, having been made several weeks, and afterwards freely exposed to the open air.

Exp. 2.—120 pounds of fresh charcoal, pulverized as before, were put into the vessel used in the preceding experiment. The charcoal was then at 70°, and the surrounding air at 62°. In 24 hours it had acquired a temperature of 90°; in 36 hours, of 110°; and in 48 hours, of 120°: from this time the temperature fell; and in 48 hours more it was down to 70°, as at the commencement.

Exp. 3.—The same quantity of charcoal was taken as in the foregoing experiments: it was quite fresh, and ground into coarse powder. In 36 hours the temperature was 130°; it then gradually declined to 70°, when the experiment was given up.

From the preceding experiments I was satisfied that spontaneous combustion would not take place in so small a quantity. I therefore determined to make the experiment upon a larger scale.

Exp. 4.—10 cwt. of new charcoal was finely ground, and put into a hogshead, with a thermometer placed, as before, in a leaden pipe. Several holes were bored in the sides of the hogshead to admit the air. The charcoal when ground was 65° ; and particular care was taken in examining the charcoal, to see that it was free from ignition. It was put into the hogshead at about 10 o'clock in the morning, at night its temperature had rised to 90° ; the following morning to 150° ; and in the afternoon of the second day the thermometer stood at 180°.

I was surprised to find at this time that combustion had taken place at about five or six inches from the surface, and about the same distance from the leaden pipe which contained the thermometer, though the temperature, as indicated by the thermometer, was only 180° or 190°.

It may perhaps be proper to remark, that the combustion always takes place *near* to the surface ; or, if small charcoal be laid against a wall, the combustion generally begins either at the surface, or close to the wall.

On the 13th of October 1831, small charcoal was thrown into a heap, which covered about 10 feet square, was about 4 feet deep, and contained from two to three tons in weight. In three days the temperature had increased to 90°, though it was at first only 57°, being the same as that of the air. On the 19th it was 150° ; and on the 20th combustion had occurred in several places. Water was thrown upon it ; and the fire was, to all appearance, effectually extinguished ; yet on the 21st it was again observed to be burning in different parts; and it continued to burn until it was removed and formed into smaller heaps.

The last experiment was the most satisfactory one which has ever come under my notice. The charcoal had been made for at least ten or twelve days before it was put together ; and had been lying, during the interval, in small heaps freely exposed in the open air.

MISCELLANEOUS.

Phrenology.—A skull was sent, by one of the members of the literary society at Chatham, to Dr. Elliotson, the distinguished President of the London Phrenological Society; and the opinion of the Society was requested respecting the character of the individual to whom the skull had belonged. Dr. Elliotson's reply:

"I exhibited the skull, with which you favoured me, to the London Phrenological Society at their last meeting, and we were all perfectly agreed upon the character of its original possessor. The Society, however, never delivers a judgment upon character on any Phrenological point; but when an opinion is desired, leaves any member, or private individual, who may think it proper, to do so.

"I take it for granted that the deceased was of sound mind; but to be accurate, we should likewise know how far he had been educated, and whether his constitution was active or indolent.

"Ignorant of these particulars, I should say, that he was a man of excessively strong passions; that these were far an overbalance for his intellect; that he was prone to *great violence*, but *by no means courageous;* that he was extremely *cautious and sly*, and fond of *getting;* the animal propensity must have been strong, but *his love of offspring* very remarkable.

"I can discover no good quality about him, except the love of his children, if he had any. The most striking *intellectual* quality in him, I should think, was his *wit*. This must have been not only great, but probably of a dry cast.

"He might also have been a good mimic.

Dr. Elliotson had the satisfaction of being assured in reply—

"That his explanation of this character was *singularly* correct in every particular, affording a new and powerful proof of the truth of phrenology."

His correspondent, however, informs him that many persons, unable to overturn the facts of the case, turn round and say, that he must have had some previous or private intimation of the character of the individual in question. He puts the following questions at once openly to Dr. Elliotson:—

"Is your detail of the felon's character drawn solely and entirely from the shape of the skull?

"Had you any previous information whatever as to his past life, habits, or education?"

Dr. Elliotson's Reply.

"Sir,—I beg to assure you, that I drew my conclusions as to the character of the individual *solely* from the size of the various parts of the skull; and that up to the moment of receiving your letter yesterday, I

was totally uninformed respecting him.....The suggestion that I had gained some knowledge privately of the individual, or had taken a hint from any circumstance whatever, might have annoyed me, were I not unknown to the gentlemen—were I not conscious of detesting every species of duplicity—and were there not something irresistibly laughable in seeing the plain facts of phrenology give one such power, as to produce an astonishment in the minds of those ignorant of them, not dissimular from that which a little chemical and physical knowledge excited in times of darkness. In those days the power of knowledge was ascribed to the devil; at the present time, such agency being universally disbelieved, the manifestation of power is pronounced a deception. The phrenologist, conscious of the truth, views the incredulity of the world as a correct measure of the magnitude of his science."

The individual whose skull formed the subject of this interesting experiment was a convict, known familiarly by the name of *Jack Turpin*. Little was known or could be learned from him of his previous life; but it was notoriously vicious and lawless: he had been a poacher and smuggler, but had never committed murder. After opportunity for better observing his character was afforded, the following particulars were ascertained:—

"*In the first place*, he exhibited a severe sarcastic wit, at the expense of those around him. The manners and language of the kind and benevolent clergyman, who officiates at the hospital, were the frequent subjects of his mimicry.

"*In the second place*, he exhibited a strong attachment to his children. He frequently spoke of them in the most affectionate manner, and made his last moments respectable, by devoting them to the disposal of his property among his offspring."

The following resolution, passed unanimously at a meeting of the Rochester Literary Club—the Society at whose request this experiment was made—well expresses the conclusion that should be drawn from such experiments.

"Resolved—That the character of L. given by Dr. Elliotson, from the inspection of the skull, corresponds so exactly with his history, that it is impossible to consider the coincidence as the effect of chance; but that it is an instance which, if supported by many others, affords a strong foundation for the truth of phrenology."

Recommendations of the Sub-Committees of the British Association for the Advancement of Science.

Meteorology.—The Committee, considering that the science of Meteorology is in more want, than perhaps any other, of that systematic direction which it is one great object of the Association to give, has thought it adviseable to propose the following points for investigation:—

I. That the Association should employ all the means in its power to procure *a Register of the Thermometer during every*

hour of the day and night, to be kept at some military or naval station in the South of England.

Note. Until the phænomena and distribution of diurnal temperature are more thoroughly understood than at present, we can hardly hope that any very sure footing has been obtained in the study of meteorology. The hourly register kept for several years at the military station of Leith Fort, in lat 56°, has shown that we want nothing but the combination of a sufficient number of trust-worthy observations, in order to obtain results of primary importance to the science, and which may one day enable us to arrive at the true form of the daily and annual curves of mean temperature with a precision almost mathematical. In order, however, to extend the benefit of such investigations, it is absolutely necessary that they should be pursued in different latitudes. The application to rendering available registers otherwise almost without value, from not being made at the proper hours, will be best illustrated by a reference to the account of the Leith observations. (Transactions of the Royal Society of Edinburgh, vol. x.)

II. That the establishment of such an *hourly meteorological register* be pointed out as a highly interesting object, in reference especially to the important point of *intertropical* climate, *to* THE COMMITTEE OF THE ASSOCIATION IN INDIA.

III. That *the Committee in India* be requested to endeavour to institute such observations as may throw light on *the phænomena of the horary oscillations of the barometer, near the equator.* Should the concurrence of the Committee on these points be obtained, it would probably be desirable that the Association should take measures for sending out delicate and accurate instruments.

IV. That Mr. Phillips and Mr. Wm. Gray, jun. of York, be requested to undertake *a series of experiments on the comparative quantities of rain falling on the top of the great tower of York Minster, and on the ground near its base.* The Committee have been induced to propose this specific question in consequence of the local fitness of the situation, and the facilities offered for its solution by the authorities; but it is to be wished that similar experiments should be made elsewhere, that by an extended comparison of observations, light may be thrown upon the anomalies which have been observed at Paris and in other places.

V. That the Association should express its desire to receive *a satisfactory exposition of the theory of the moistened bulb hygrometer,* and that observers be also invited to institute *series of comparative experiments on the indications of the moistened thermometer and the temperature of the dew point.*

Note These indications may be ascertained by Mr. Dalton's process, or by Mr. Daniell's Hygrometer, or by both. Notwithstanding the ingenious and laborious researches of Hutton, De Saussure, Leslie, Anderson, and Gay-Lussac upon this subject, scientific deductions drawn from more extended experiments are greatly

wanted. The simplicity and certainty of the experiment by which the cold produced by the evaporation of water is measured, renders an accurate theory of the result peculiarly desirable. The experimenter would do well to consult Mr. Dalton's views on the theory of Hygrometry, contained in his *Meteorological Essays*, and in *the Manchester Transactions*, and to examine the investigations of Professor Leslie, (*Relations of Heat and Moisture*, and *Supplement to the Encyclopædia Britannica, Article* METEOROLOGY;) of Dr. Anderson (*Edinburgh Encyclopædia, Article* HYGROMETER,) and of M. Gay-Lussac, (*Biot, Traité de Physique, tom* ii.) A good series of observations at high temperatures will be found recorded in Nos. II. and III. of a Calcutta Journal, entitled *Gleanings in Science.*

VI. That experiments *on the Decrease of Temperature at increasing heights in the Atmosphere* be recommended as an important subject for the contributions of observers.

Note. Series of observations for considerable periods of time on the mean temperature of the air at fixed hours, and at stations of which the difference of height has been accurately measured, are the most valuable. The best hours for observation are those which give most accurately the mean temperature of the period of observation. The hourly observations at Leith Fort have determined the hours which give the annual mean temperature in this country to be about 9¼ A.M. and 8½ P.M. Experimental balloons have lately been employed to assist the solution of this problem, which is one of the most interesting in Meteorology; but the investigation of it is nearly brought to a stand for want of sufficiently numerous observations. The observer may be referred for information to Ramond, *Mémoires sur la Formule Barometrique de la Méchanique Céleste;* to the Researches of Humboldt; to Professor Leslie, *Supplement to the Encyclopædia Britannica, Article* CLIMATE; to Pouillet, *Elemens de Physique;* to Mr. Atkinson's Paper on Refractions in the *Memoirs of the Astronomical Society;* and to Mr. Ivory's Memoir on the same subject in *the Philosophical Transactions*, and his Papers in *the Annals of Philosophy.*

VII. That the observation of *the Temperature of Springs at different heights and depths* should be pointed out as an object of great interest, in prosecuting which insulated inquirers may render essential aid to science.

Note. When springs are copious, a few observations in the course of the year suffice to give with great accuracy their mean temperature. The height of the springs above the mean level of the sea, and the depth of Artesian wells, should be carefully observed; and where the corresponding mean temperature of the air can be obtained, it should be stated. In two points of view these observations are important, independently of the inferences which they may furnish as to the decrease of heat in the atmosphere. The great interest attached to the phænomenon of the progressive increase of temperature of the globe, as we descend through the Strata, renders of value observations on the temperature of springs at considerable heights, of springs in mines, and of those brought to the surface from some depths by the process of boring. This question has been treated with great success by M. CORDIER,

in several Memoirs, some of which have been translated into English. Again, the researches of Humboldt, Buch, Wahlenberg, and most recently Kupffer in a Memoir on *Isogeothermal Lines*, read before the Academy of St. Petersburg, in 1829, have shown that the temperature of the earth differs in many parts of the globe from that of the air, being generally in defect below lat. 56°, and in excess beyond it. The progressive increase of temperature with that of the depth in Artesian wells, and the deviation of the mean temperature of the Earth from that of the Air in different latitudes, have opened new fields for discussion; and by the zealous co-operation of observers cannot fail to present results, of which at present we can form but an imperfect idea.

Magnetism.—It appears to the Committee highly desirable that a series of observations upon the *Intensity of Terrestrial Magnetism in various parts of England* be made by some competent individual, similar to those which have recently been carried on in Scotland by Mr. Dunlop.

Should the Committee succeed in finding some individual ready to undertake the task, they propose that an application should be made to the Royal Society of Edinburgh, for permission to make use of the Standard Needle belonging to them, and constructed under the direction of Professor Hansteen of Christiania.

It appears to the Committee of considerable importance, that a certain number of observations should be made throughout Britain with *the Dipping Needle*, in order to reduce the Horizontal to the true Magnetic-Intensity.

Note The time of three hundred vibrations should be observed, and the methods of observation and reduction should be the same as have been employed and described by Humboldt, Hansteen, and others.

Electro-Magnetism.—The Committee recommend, as an important subject for further prosecution, the examination of the *Electro Magnetic condition of Metalliferous Veins.* The Committee would refer for the details of what has been already done upon this subject, to the Paper of Mr. Fox in the Philosophical Transactions for 1830; and would propose that the experiments should be extended to veins which traverse, as in some of our mines, horizontal and dissimilar strata.

Tides.—M. Daussy has shown, that on the coast of France, between Ouessant and the coast of Spain, the Atmospheric pressure has considerable influence upon the height of the tide: one inch of rise in the mercurial column depresses the tide fourteen inches. He found that the influence of the wind upon the height of high-water is insensible. M. Ludbock has ascertained "that in the river Thames the influence of the fluctuations of the Barometer upon the tide is insensible or very nearly so." He has also found "that the direction of the wind (unless in violent gales) has no effect upon the phænomena of the tides in the river Thames."

SOUTH AFRICAN INSTITUTION.

6th Nov. The Secretary reported that the Rev. Dr. Philip had presented two interesting Zoological Specimens for the Society's Museum,— the one Manis Temminckii, the other Python Natalensis; and that both of them had been brought from the interior, eastward of Latakoo. The latter, Dr. Smith stated, was also found in the country about Port Natal; and that he had in his possession a specimen which was killed by his party whilst he was there.

At the request of Mr. Verreaux, the attention of the meeting was called to three birds which he had lately received from Madagascar, and which, from considering them new to science, he had named and characterised as follows:—

Accipiter Madagascariensis. Above dull brown with an irregular white spot on the nape; beneath white freely crossed with fine brown bars: vent and under tail coverts, pure white; tail brown above, ashy white beneath, and both surfaces crossed by eight narrow brown-black bands. Length thirteen inches and a half.*

Glareola ocularis. Head and shoulders green-black; under each eye a fine transverse white stripe; upper parts of neck and back green-grey; chin white; under parts of neck and the breast brownish grey; anterior part of belly pale chesnut; hinder parts, and under and upper tail coverts white; base of tail partly black and partly white, the tips of a few of the feathers white, the other parts pure black; bill black with the edges of the mandibles towards the angles of the mouth, red. Length about eight inches and a half.

Rallus Madagascariensis. Head and chin grey; neck, breast and belly rusty grey-brown; back rusty olive blotched with black; vent barred transversly with reddish white; under tail coverts white; point of bill and upper surface of upper mandible blackish brown, the other parts of the bill yellowish. Length eight inches and a half.

Dr. Smith stated, that the Rev. Mr. Wright, of the London Missionary Society, had found, by means of a Trochiometer connected with one of the wheels of his wagon, that the distance between Griqua Town and Cape Town, *via* Beaufort, was 622 English miles.

The reading of Mr. Chase's paper, entitled "An Account of the Progress of Geographical Discovery in the African Continent made from the Cape of Good Hope," was resumed and concluded. The author in this part of his paper gave a brief detail of the various attempts which had been made to explore the country along the South-east Coast, and concluded by a summary of the information which had resulted from those expeditions.

* Can this be the Astur fasciatus of Vigors and Horsfield? *Ed.*

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 64.

Genus Chrysochloris. *Lacepede.*

Incisors $\frac{2}{4}$, *conical teeth* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{6}{5}\frac{6}{5}$,—40. *Upper incisors strong and sharp, lower intermediate ones very small; muzzle terminated by a cartilaginous appendage; fore feet short with three toes armed with strong nails; hinder feet with five toes; eyes very small; external ears and tail wanting.*

Chrysochloris Capensis. Desm. (Cape Mole.) Fur moderately long and silky; the surface colour of the back and sides a very deep green with a brilliant metallic or coppery gloss which varies in intensity and shade according to the light in which it is viewed; beneath greyish green with less of the metallic lustre; behind and a little above the angle of the mouth on each side, a more or less distinct and irregular-shaped white spot. Length from nose to hinder part of back about five inches.—On the back and sides each hair is dull greyish white towards middle, and dark greyish blue towards its base, beneath dark blackish blue except the tip.

Inhabits South Africa,—in gardens about Cape Town.

Desm. *Ency. Method.* 156. Aspalax, Seba. Talpa Sibirica Aurea, Brisson. Talpa Asiatica, Gm. Musaraigne Dorée, Cuv. *Tab. Element. des Anim.* Schreb. *tab.* 157.

Chrysochloris Hottentota, Smith. (The Red Cape Mole.) Fur moderately long, and not quite so fine as the last; the surface colour above and on the sides is reddish brown or ferruginous of various shades with a metallic gloss, which is not so conspicuous as in the last; beneath pale ferruginous. In some specimens the centre of the back has a dark greenish tinge. The middle and baselar portions of the hairs are of a dark slate colour; the apex of the muzzle light flesh coloured; figure of this species more slender than that of the Chrysochloris Capensis. Hinder extremities with five toes. Length about five inches.

Inhabits South Africa.—Eastern districts of the Colony.

Obs. I am not satisfied that Naturalists are warranted in considering this as identical with the Talpa rubra Americana of Seba, and therefore have continued to it the name, under which I described it, in the Zoological Journal, *vol.* ii. *p.* 436.

Chrysochloris villosa, Smith. (Natal Mole.) Fur long and rather coarse; the surface colour of back and sides light tawny brown sprinkled with dark blackish brown; of the rump bluish black; the under surface indistinct tawny brown with a grey shade; chin, upper lip, and sides of head white, sprinkled with

dusky black; snout elongated, and its apex flesh-coloured; claws greenish white. Length from nose to hinder part of back five inches and a quarter.—When the long hairs which form the outer surface are deranged, or reversed, a shorter description of fur is observed abundantly interspersed amongst them, of a very fine texture, and dark slaty grey colour, except on the head, where it is white.

Inhabits South Africa,—towards Natal.

Genus Centenes. *Illiger.*

Incisors $\frac{6}{8}$ *or* $\frac{6}{4}$, *canines* $\frac{1}{1}$, *molars* $\frac{6}{6}\frac{6}{6}$,—38 *or* 40. *Canines very strong; molars crowned with points. Muzzle elongated and pointed; ears short and rounded; body covered with spines and bristles; feet five-toed; nails curved; no tail; incapable of rolling itself up into a globular form.*

Centenes setosus. (The Tandrac.) Spines long and flexible, somewhat like hairs; six sloping incisors in each jaw. Length from ten inches to a foot.

Inhabits Madagascar and Mauritius.

Erinaceus setosus, Lin. E. Tanrec, Bodd. *Elem. Anim.* 129. Tendrac Setiger Inauris, Geoff. *Coll. du Mus.* Cuv. *Tab. Elemeni. des Anim. et Reg. Animal.*

Centenes spinosus. (The Tenrec.) Spines short and stiff on the upper parts of the body; bristles and hair on the lower parts. Incisors sloping and but four in number in the lower jaw. Larger than the European Hedgehog.

Inhabits Madagascar.

Erinaceus ecaudatus, Lin. Erinaceus ecanthurus, Bodd. *Elem. Anim.* 129. Setiger ecaudatus. Geoff. *Coll. du Mus.* Tandrac, Buff. xii.

\+ *Centenes semispinosus.* (The radiated Tenrec.) Body with a mixed covering of bristles and spines, which are annulated with yellow and black colours. Canines slender and curved; six incisors, both above and below. Length four inches.

Inhabits Madagascar.

Erinaceus semispinosus, Cuv. *Tab. Element. des Anim. et Reg. Animal.* Seteger variegatus, Geoff. *Col. du Mus. d' Hist. Naturel.*

There is a small animal inhabits damp and marshy situations near Natal, which, from the descriptions of the natives, I am inclined to consider as a species of this Genus.

Fam. CARNIVORA. *Cuvier.*

Six incisors in each jaw, cheek teeth without the sharp points of the *Insectivoræ*, but either trenchant or tuberculous or both; the species more or less carnivorous, canines long and strong.

* *Plantigrada*—soles of the feet resting entirely on the ground.

Genus Ratellus. *Cuvier.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{4}{4}\frac{4}{4}$,†—32. *Upper jaw—the outermost incisor of each side longer than the intermediate ones, and shaped somewhat like the canines; the first and second molars each with one point; the third with three distinct and unequal points; the fourth with two flat tubercles, one on the outer edge and one on the inner. Under jaw,—Incisors nearly equal, each more or less bilobate; the first and second molars each with one point, the third with two unequal points, and the fourth with three also unequal. Muzzle short; nose acute; eyes small; no external ears; feet plantigrade, toes five, claws curved and pointed; tail short;—skin very thick and loosely attached to the soft parts; figure robust.*

Ratellus typicus. (The Ratel.) The upper part of the neck, the back, the upper half of the sides and the base of the tail, above dull white, slightly variegated by an intermixture of black hairs; face, sides of head, throat, breast, belly, and rest of tail, pure black; top of head and a stripe along the sides immediately over the black, nearly an uniform white. Length from tip of nose to base of tail twenty-nine inches, of tail seven inches.

Inhabits South Africa.—Central Africa, *Denham.*

Viverra mellivora, Gm. Viverra Capensis, Gm. 89. Ratel, Spar. *Act. Stoch.* 1777. The Fizzler Weasel, Penn. *Quad.* Honey Weasel, Shaw's *Zoology*, 395. Gulo Capensis, Desm. *Mam. p.* 176.

** *Digitigrada*,—walking on the toes.

Genus Putorius. *Cuvier.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *cheek teeth* $\frac{4}{5}\frac{4}{5}$, *or* $\frac{5}{6}\frac{5}{6}$,—34 *or* 38; *two false molars above and three below; the great carnivorous tooth below without an internal tubercle. Muzzle short; ears short and round; body long and slender; legs short; toes five, armed with sharp crooked claws; no anal pouch, but with a small gland secreting a strong stinking ungent.*

Putorius Furo, Lin. (The Ferret.) Head narrow and elongated; body slender; hair light yellowish brown or cream-coloured,

† In some works the molars are said to be $\frac{4}{5}\frac{4}{5}$. In the specimens I have examined there have been only four molars in the lower jaw.

slightly varied with white, from some of the hairs being partly of that colour; eyes a bright and lively red. Length from nose to base of tail fourteen inches and a half.

Inhabits North Africa.—Domesticated in Europe.

Mustela Furo, Lin. *Syst. Nat.* 1. Le Furet, Buff. vii. The Ferret, Penn. *Quad.* 214.

Many Naturalists consider the Ferret as merely a variety of the *Putorious vulgaris*, or Polecat.

Putorius Africanus, Desm. (African Weasel.) Body above reddish brown; beneath pale yellow with a narrow longitudinal reddish brown band along the centre of the belly, Length of the body and head ten inches, of the tail seven inches.

Inhabits Africa.

Mustela Africana, Desm. *Nouv. Dict. Hist. Nat.* xix. 376.

Putorius Zorilla. (Cape Weasel.) Black with four, more or less waved, white bands on the back, which extend from the hind-head to near the base of the tail; a white spot on the centre of the face and one on each cheek; the ears also margined with white. Tail bushy and variegated black and white; some of the hairs entirely white, others partly black and partly white; claws light horn-coloured. Length from nose to base of tail twelve inches, of tail nearly nine inches.

Inhabits South Africa.

Viverra Zorilla, Gm. *Syst. Nat.* 1. Putois du Cap ou Zorcille, Buff. xiii. Striped Muishond *of the Cape Colonists.*

Genus Lutra. *Ray.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\,\frac{1}{1}$, *molars* $\frac{5}{5}\,\frac{5}{5}$ *or* $\frac{5}{6}\,\frac{5}{6}$,—36 *or* 38. *The lower great carnivorous tooth with two points on its outer side; head large and flattened; ears short; body long; legs short; toes webbed; nails crooked; tail long, flattened horizontally.*

Lutra inunguis. F. Cuvier. (Cape Otter,) Woolly hairs* white at their bases and brown at their tips; bristly hair short, and covering the others. The muzzle, in front of the eyes, the upper parts of the head and neck, the back and sides, yellowish brown; the tail and extremities dark reddish brown; the head and neck finely freckled with dull white; nose black and bare; the muzzle close to the nose; the lips, sides of head, chin, throat, and lower parts of neck white; margins of lips and chin with a dirty brownish tint; whiskers white towards their bases, amber coloured towards tips; ears pointed, and covered on both surface with short dark brown hair, more or less of their circum-

* Visible upon separating the bristly hairs.

ference white; toes without nails. Length from nose to tail thirty-four inches; length of tail twenty inches.

Inhabits South Africa,—in rivers, lakes, and bays.

Dict. Scien. Nat. xxvii. *p.* 248. Aonyx Lalandii Lesson. *Mamm. p.* 157. 484. Isid. Geoff. *Dict. Class* ix. *p.* 519. Otter *of the Cape Colonists.*

Genus Canis. *Linnæus.*

Incisors $\frac{6}{8}$, *canines* $\frac{1}{1}$, *molars* $\frac{6}{7}$,—42. *The three first molars in the upper jaw, and the four in the lower, small, edged; the great carnivorous tooth above biscuspid, with a tubercle on the inner side; two tuberculous teeth behind each of the large carnivorous ones; muzzle elongated; tongue soft; ears erect; fore feet five-toed; hinder feet four-toed; teats inguinal and ventral.*

Canis aureus, Linnæus. (The Chacal.) Hairs rigid, short about the nose, on the back three inches long. The colour of the upper parts of the body a dusky tawny, on the back mixed with black; lower parts of body yellowish white; extremities tawny brown; the fore legs commonly marked with a black spot on the knees. Ears erect, formed like those of the common Fox, but shorter and less pointed; externally they are covered with a brownish hair tinged with dusky yellow; internally with a white hair: eyes yellowish brown; lips black; tail thickest in the middle, black at the extremity, elsewhere of the colour of the body. Length from nose to base of tail twenty-nine inches; length of tail about eleven inches: height at shoulder about eighteen inches and a half; at the rump rather greater.

Inhabits Barbary and Asia.

Lin. *Syst. Nat.* 1. 59. C. Barbarus, Shaw. *Zool. t.* 311. Lupus aureus, Kæmpf. *Ann. Exot.* 413. Schakal, Penn. *Quad.* 262. Le Chackal, Buff. *Sup.* vi. Deab or Dib of Barbary.

Canis mesomelas, Gmelin. (Cape Jackal.) Woolly hairs, on back, sides, and belly, dull white at their bases, dusky or tawny at their tips; on the neck they are entirely a dull white. From the hind head to the root of the tail a clear black band, narrow on the neck and broad on the back, where it is more or less chequered, particularly in the centre, by white variegations, in the form of large spots or stripes; sides of neck greyish white, most of the hairs with black points; shoulders pale tawny, brindled with black, excepting a large blotch on each, which is nearly without any intermixture of the latter colour. Sides, anterior part of belly, outer sides of extremities, outer surface of ears, and the muzzle, light rufous shaded with tawny; anterior surface of ears broadly margined with white hairs; upper and lateral parts of head grizzled, greyish white, tawny,

and black, the proportion of the latter great before and under the ears. Lips, chin, throat, and under parts of neck, yellowish white; many of the hairs on the latter slightly tipt with black: insides of extremities, breast, and centre of belly behind, white with tawny shades. Tail largest near the middle, whitish above towards its root, with the points of a few of the hairs black, from thence to the tip the hairs are white at their bases and black at their points; those close to tip nearly entirely black, beneath towards base reddish white, passing into deep rufous. Length from nose to base of tail about thirty inches; length of tail about twelve inches: height at shoulder about eighteen inches.

Inhabits South Africa.

Cape Schakal, Penn. *Quad. p.* 265. Cape Jackal, Shaw's *Zool.* 1. 310. Jackal *of the Colonists.*

Canis Niloticus. (Egyptian Fox.) Woolly hair soft, abundant, and of a grey colour; the bristly hairs are a foxy red, a few of them on the back and sides tipt with yellow. Lips, chin, and part of the cheeks, white; whiskers and outer surface of ears black; throat, under parts of neck and belly, and the sides of feet, ash grey, bordering on violet blue; tip of the tail white; soles of the feet moderately covered with hair; nails projecting; eyes brown. Length from nose to root of tail twenty-five inches; length of tail twelve inches and a half; height at shoulder thirteen inches and a half, at rump fourteen inches.

Inhabits Egypt.

Canis Niloticus aut Ægyptiacus, Geoff. *Coll. Mus. Par.* Desm. *Mamm.* 204. Rupell, *op. cit. p.* 41. *tab.* 15. Sabora *of the Arabs.*

Canis variegatus. (Variegated Jackal.) The woolly hair is soft, and bright ochre coloured; the rigid hairs of the back and sides ochre coloured at their bases, then black, then ochre coloured, the tips shining black, and disposed in patches, so as to produce a chequered black and yellowish surface. Head rather broad; nose blunt and black; muzzle dark ochre coloured; forehead, crown, and cheeks, variegated with short, black, white, and brown hairs; inner surface of ears bordered with white hairs; outer surface an uniform ochre colour: chin, throat, breast, and belly, dirty white; whiskers, cheeks, and eyebrows, black. Tail short, chequered like the back with black spots; extremities long, the hinder ones longest, ochre coloured, darkest towards the body, the hair very short; soles of the feet bare and black; nails short, thick, blunt, and black. From neck to base of tail a black mane, the hairs several inches long; eyes brown. Length from nose to base of tail two feet

one inch; length of tail ten inches: height at shoulder fourteen inches, at rump fifteen inches and three lines. In young specimens the hair is long but little chequred, and all the colours are dull.

Inhabits Nubia and Upper Egypt.

Rupell, *Atlas zu der Reise in Nordlichen Afrika, p.* 31. *tab.* 10. Abu Schom *of the Arabs.*

Canis variegatoides, Smith. Woolly hairs scanty; on back and sides they are whitish towards their roots, dusky in the middle, and tawny at their tips; on the neck they are pale dusky grey with tawny points: bristly hairs abundant and rigid, particularly on the back of the neck. Upper parts of the body and neck chequered with black and white; on the latter the white predominates, on the former the two colours are nearly in equal proportions, and disposed in somewhat zig-zag transverse lines; at the shoulders this chequered band descends nearly to the root of the fore legs, from whence it gradually narrows to the tail, and is marked by well defined edges. Near the centre of each shoulder a broad perpendicular light-coloured blotch, without any intermixture of black; lower part of sides and outer surfaces of extremities pale tawny red, finely sprinkled with white lines, from the hairs being annulated with that colour; upper and lateral parts of head tawny red, very finely pencilled with black and white; outer surface of ears a, blotch, below their bases, and the centre of muzzle chesnut coloured. Upper and lower lips, chin, and part of throat, reddish white; lower part of neck dull tawny, slightly sprinkled with white; breast and belly tawny white; insides of extremities inclined to white. Tail moderately bushy, and tapered towards the extremity; ground colour dull white, the terminal portions of the bristly hairs black; near the tip they are almost entirely black; on the upper surface, about two inches from the root, there is an irregular black blotch; on the under surface at the root, the colour is an uniform tawny red; nails black. Length from nose to base of tail thirty-five inches; length of tail fourteen inches and a half: height at the shoulders about eighteen inches.

Inhabits South Africa.

Vaal Jackal *of the Cape Colonists.*

Canis familicus. (Chesnut Jackal.) Woolly hair, very fine, silky, and abundant; grey on the back and isabella coloured on the sides: bristly hairs whitish red with bright shining chesnut brown points, which give to the upper surface an uniform chesnut hue; the other bristly hairs terminate some in black, some in white, and some are entirely black. The long hairs on the upper surface of the tail are black; on the

under surface and at the tip isabella coloured; throat, breast, and belly, a whitish isabella hue; neck surrounded towards the breast by a band of dark stiff hairs. Nose black with a white border; lips white and a reddish stripe extends from each eye to a black spot on the side of the muzzle from which the whiskers proceed. The rest of the head as far as the neck a bright ochre colour; ears very long, erect, greyish without, naked and flesh coloured within, and margined with soft yellow hair, inside of which, on the anterior surface, is a stripe of long white hair; outer sides of anterior extremities ochre red; inner sides pale yellow, with a greyish stripe along the front of each; hinder extremities as far as the knees chesnut, below them a reddish tint, which extends as far as the heel, the inner side of which is pale yellow. Toes and soles of the feet enveloped in a dense yellow woolly hair; claws long and white; eyes brown. Length from nose to base of tail twenty inches; length of tail fourteen inches: height at shoulder ten inches and six lines; at rump eleven inches two lines.

Inhabits Kordofan and Nubia.

Rupell, *op. cit. p.* 15, *tab.* 5. Sabora *of the Arabs.*

Canis Anthus. (Senegal Jackal.) Woolly hair abundant, and red-brown, darkest on the back, lightest on the sides; bristly hairs of the back, sides, and upper parts of the neck, scarcely an inch in length; dull white towards their bases, and most of them tipt with white, some with black and others with an ochre colour, many annulated with brown near the points, which, together, produce a variegated black, white, reddish, and yellow surface colour. Head broad, muzzle long and not very slender; edges of the lips and beard black; cheeks, forehead, crown and nape variegated by white, brown, and black short hairs: ears erect, short, and pointed; anterior surface with white tufts; posterior surface thickly covered with fine smooth short hair: lips, chin, throat, and under-parts of neck, dirty white; neck, near to breast, surrounded by a black ring. The first third of the tail above with a red-brown spot, and blackish oblong stripes, beneath ochre coloured; the remaining two-thirds black: anterior and posterior extremities ochre coloured, with a dark brown tint, darkest on the outer sides; nails blunt and black; soles of feet bare and black; eyes brown. Length from nose to tail two feet four inches; tail about one foot; height at shoulder fifteen inches, at rump sixteen inches.

Inhabits Abyssinia, Nubia, Egypt, and Senegal.

Canis Anthus, F. Cuvier, *Mam. Lith. tab.* 17. Rupell, *op. cit. p.* 44. *tab.* 17. Diel *of the natives of Abyssinia.*

Canis pallidus. (Pale-coloured Jackal.) Woolly hair abundant, very fine, and throughout a straw yellow, tinted with

pale red; on the back each hair towards its base is grey: bristly hairs rough, and covering the others. On the upper parts of the neck and back each hair is annulated with white and tipt either with black or reddish, so that the surface colour is a mixture of black, reddish, and white; nose, eyebrows, beard, and cheeks, black; ears moderately pointed and margined with white, inner surface bare, a tuft of hair at the external opening; outer surface covered with short pale straw-coloured hair; on the head an intermixture of white hairs; temples, throat, breast, and belly, whitish. Neck surrounded by a pale straw-yellow ring; inner sides of feet and outer sides of legs, whitish; inner sides of fore feet, a spot on each shin and the back parts of the heels of the hinder feet red-brown, the soles moderately covered with hair. On the upper surface of the tail, about an inch from its root, an irregular black spot, and many of the bristly hairs are tipt with black; extremity of tail black; nails long and somewhat curved; eyes clear brown. Length from nose to tail about nineteen inches and a half; tail ten inches; height at the shoulder about nine inches, at the rump nearly ten inches.

Inhabits Abyssinia.

Ruppell, *op. cit. p.* 33. *tab.* 11. Abu. Hossein *of the Arabs.*

Canis Chama, Smith, (The Asse.) Muzzle, centre of face, and top of head, yellowish brown, variegated by an intermixture of bristly hairs annulated black and white; sides of head an uniform whitish yellow; upper lip, towards angles of mouth, lower lip, and chin, blackish brown; whiskers and edges of eyelids black; ears large, outer surfaces yellowish red, inner, margined with white hairs, elsewhere bare. Woolly hairs of neck and body abundant; their tips reddish white or yellowish white, elsewhere a dull smoke colour; bristly hairs abundant on back of neck and centre of back; on sides, shoulders, and outsides of thighs, less numerous, all annulated black and white; the tips black. Extremities yellowish white, inclined to white on their anterior surfaces; a large brownish black blotch on the posterior surface of each hinder extremity about half-way between the feet and base of tail. Under parts of neck and body whitish yellow. Tail very bushy, the prevailing colour yellowish white, the upper surface towards base variegated with bristly hairs annulated black and white, the black, about three inches from the root, is so disposed as to give an appearance of one or two waved transverse black stripes; from thence to the point the bristly hairs are all tipt with black, and at the very extremity of the tail they are almost entirely of that colour so that it appears perfectly black. Length from nose to base of tail twenty-three inches; length of tail thirteen inches; height at shoulder twelve inches, at rump thirteen inches.

Inhabits Namaqualand and the country on both sides of the Orange river.

Canis Zerda, Boddaert. (Bruce's Fennec.) General colour white, inclining to straw-yellow; above from hind head to root of tail light rufous brown, delicately pencilled with fine black lines, which are produced by some of the hairs being tipt with black; outer sides of thighs light rufous brown. Chin, throat, breast, belly, and inner sides of extremities, white or cream-coloured; sides of the muzzle white, and from the inner corner of each eye descends a narrow brownish stripe; edges of lips, whiskers, and bristles over the eyes and on the cheeks, black. Ears large, erect, and pointed: externally covered with short pale rufous-brown hair, internally thickly fringed on the margins with greyish white hairs of about an inch in length, elsewhere bare. Tail very bushy, cylindrical, and of a rufous brown colour, with fine black lines like those of the back; on the upper surface, about an inch and a half from its root, a dark brown spot; the tip is black; nails straight and strong. Woolly hairs dirty white at their roots and isabella coloured towards their tips; the bristly hairs of the back are tricoloured, viz. dark bluish grey at their roots, white in the middle, and light rufous brown at the tips. Length from nose to base of tail about fifteen inches and a half; length of tail eight inches and a half; height at the shoulders seven inches and three-quarters, at the rump nearly eight inches and a quarter.

Inhabits Abyssinia, *Bruce*;—Nubia, *Ruppell*;—Central Africa, *Denham*.

Canis cerdo, Gm. Fennecus Brucii, Desm. *Mamm.* 235. Animal Anonyme, Buff. *Sup.* vii. Fennec, Bruce, *Travels in Abyssinia*.

Canis megalotis, Cuvier. (Lalande's Fennec.) Hair rather shaggy, particularly along the centre of the back, where it forms a sort of mane; colour above iron-grey, slightly tinted with yellow, inclined to fulvous. On the middle of the back, forehead, cheeks, and sides of muzzle, finely freckled black and white; centre of muzzle black towards forehead, brownish towards nose; under lip, chin, and whiskers, jet black. Ears very large, margined towards their tips with black, towards their bases with white; inner surfaces thinly covered with greyish white hairs; under parts of neck and body tawny white; extremities blackish brown, towards toes inclined to black; tail towards tip black, towards base tawny grey, variegated with some black hairs. The bristly hairs of the back and sides annulated, tawny brown, greyish, and black. Length from nose to base of tail about three feet; length of tail about fifteen inches.

Inhabits South Africa.—Districts of Uitenhage and Graaff-Reynet.

Cuvier, *Ossem. Fossiles.* Desm. *Mamm.* 1. 538. Canis Lalandii, *Dict. Class.* iv. *p.* 18. Megalotis Lalandii, H. Smith, *in Griffith's Translation of Cuvier's Animal Kingdom.*

Genus Lycaon. *Brookes.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}$, *molars* $\frac{6}{7}$,—42. *The little lobe in front of the false molars rather more developed than in dogs. Head short, muzzle more or less pointed; body higher before than behind; joints of carpus weak; fore feet with four toes, hinder with five.*

Lycaon typicus. (Burchell's Lycaon.) General or ground colour a sandy bay or an ochreous yellow shaded with a darker hair. The whole body and outer sides of extremities blotched and brindled with black, intermingled in various parts with white spots edged with black. All these spots and markings are exceedingly irregular, and in some degree vary in different individuals. Its most constant marks are, a deep black stripe extending from the nose up the middle of the face and between the ears, the latter are blackish both within and without, and covered with very short close hair, which is sometimes very thin at the anterior margin of the ears; on the inside, a tuft of whitish hairs. The nose and muzzle black. The tail is bushy like that of the fox, and is divided about its middle by a black ring, above which the colour is nearly the same as the general tint, and below, it is white.

Inhabits South Africa.

Hyæna picta, *Tem. Mem de Bruxell.* Penn. *Quad.* Canis pictus, Desm. *Mam.* 1. 538. Hyæna venatica, Burchell, *Travels in South Africa, vol.* i. 456. ii. 99, 229. Lycaon tricolor, Brookes

Obs. When this animal begins to walk or run, after having been at rest for a time, it appears weak or even lame in the hind legs like a Hyæna. It never barks, but gives utterance to a shrill sound resembling ho, ho, ho, ho, ho; the sounds being almost lost in each other.

Lycaon pictus (Ruppell's Lycaon.) Head strong and thick; nose obtuse and broad; muzzle and face up to the eyes black, with a few white hairs on the upper and lower lip; forehead, crown, upper and lateral parts of neck, an ochre colour, verging towards red. From the nose a black stripe extends across the sides of the head and along the neck, which is present in all specimens, and may be considered the diagnostic character; about the throat a few curly hairs, the colours of which are white, yellow, and black; the remainder of the body marked with white, black, and ochre coloured patches, which are never distributed alike in any two specimens; their size even varies

on the same parts of the body in different individuals. The white and ochre coloured patches have always black edges. Ears black on their hinder surfaces and edges; ear tufts and inner edges ochre coloured; eyes brown; tail ochre coloured at its base, then black; towards the extremity it is white. Length from nose to base of tail three feet three inches; length of tail one foot three inches and a quarter: height at the shoulder one foot ten, at the rump one foot eleven inches.

Inhabits Korti and the sandy regions of Kordofan.

Canis pictus, *Atlas zu der Reise in Nordlichen Afrika von* Ed. Ruppell, *fol.* 35, *tab.* 12.

Obs. In Ruppell's Atlas this and the Cape species are regarded as identical, but several discrepances are indicated, particularly in the colours, and their distribution. I have every reason to believe that Ruppell's species exists at the Cape, but I am satisfied that it is not the same as the Hyæna venatica of Burchell. The Cape farmers are acquainted with two species of what they call *Wilde Hond;* the one they describe as larger, darker coloured, and much more ferocious than the other. This I am inclined to view as the C. *pictus* which is described in the work quoted, as being in the habit of attacking man.

Genus Viverra. *Linnæus.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *cheek teeth* $\frac{6}{6}\frac{6}{6}$,—40. *Upper jaw—three false molars, a little conical, and compressed; a large sharp cutting carnivorous tooth somewhat tricuspid, and two tuberculous ones. Lower jaw—four false molars, a large bicuspid carnivorous tooth and a tuberculous one behind it. Head long;—muzzle pointed; feet five-toed; claws semi-retractile; anal pouch very deep, divided into two bags, which are filled with a musky secretion. Figure rather robust.*

Viverra Civitta, Lin. (The Civet.) Grey with brown or black stripes and spots, the former on the shoulders narrow and parallel, on the body and thighs larger, and sometimes so approximated and curved as to form eye-like spots. Sides of the neck white with three transverse black bands; under parts of the head, the muzzle, and the legs, black; upper lips white; inner surfaces of ears greyish white, outer surfaces black; under parts of body white, the bases of the hairs brown or black. Tail moderately long, surrounded towards the base with four or five black rings; the last six inches towards the tip perfectly black: along the centre of the back and tail the hair is longest, and produces the appearance of a mane. Length from nose to base of tail about twenty-six inches; length of tail thirteen inches.

Inhabits Africa, especially Abyssinia,—also some parts of Asia.

Civetta Clusius. La Civette, Buff. *Hist. Nat.* ix. The Civet, Penn. *Quad.* 11.

Genus Genetta. *Cuvier.*

*Teeth as in Viverra; anal pouch reduced to a mere fold of the skin, containing very little secretion; tail rather long; figure slender; strikes and scratches with the fore feet like cats.**

Genetta vulgaris? (Common Genet.) Ground colour reddish white, or dull yellowish grey, variegated with stripes and spots. The stripes vary as to number and distinctness in different individuals, but three are always evident, viz. one between the hind-head and root of the tail, and one on each side of back of the neck, which terminate at the posterior edges of the shoulders. The sides of the neck and body, the shoulders, and outer surfaces of hinder extremities, towards their roots, rather closely spotted, the spots with reddish brown centres and black edges, those on the sides disposed in somewhat longitudinal rows, and are largest towards the back. Under parts of neck and body dull yellowish white slightly mottled with dusky spots; ground colour of extremities the same as that of the body, the fore ones marked in front by small blackish spots, the hinder ones, in addition to spots, have each a large black blotch on their posterior surface just over the heel. Head pale brownish red pencilled with black; under each eye and on each side of nostrils, a whitish spot with the space between them blackish; whiskers black; outer sides of ears black at base, reddish white elsewhere; inner sides margined with reddish white hair, elsewhere bare. Tail annulated alternately black and white; the rings about nineteen in number, and nearly of equal breadth, the last one black. Length from nose to root of tail nineteen inches; length of tail sixteen inches: height at shoulder seven inches, at rump seven inches and a half.

Inhabits South Africa, towards Natal.—Europe.

Viverra Genetta, Lin. La Genette, Buff. *tom* ix.

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* The *Viverræ* of Linnæus appear to me to have had a very inappropriate position assigned them in our systems, and it is only from not having the means of examining others of them than the *Genets*, that I have not placed some of the species at least in close fellowship with the *Feline* race. Like Cats, the Genets hiss when approached or irritated, like them they spring upon their prey; they strike and scratch with the fore feet, they climb with great facility, and their colours are disposed in a somewhat similar manner. An accurate observance of the powers and habits of animals would doubtless direct to the discovery of many hitherto overlooked identities or affinities in structure, which would suggest a more natural and satisfactory classification than even the best at present existing, which, to say the least of it, every one must acknowledge is well calculated to humble man, and prove to him how little he yet has discovered of the real plan of the Author of the World.

Genetta Fossa. (The Fossane.) Ground colour yellowish white or reddish grey; the middle of the muzzle, the forehead, and the upper parts of the sides of the head, variegated brown red and grey; over the eyes a yellowish white spot. From the hind head to the tail four black bands, which, from the middle of the back are formed by close set distinct spots; the upper and lateral parts of the neck and of the body are marked by black spots or stripes; the shoulders, the sides of the breast, and belly, and the outer sides of thighs, similarly variegated; flanks with about three waved perpendicular black stripes. Upper lip, lower jaw, throat, breast, belly, and a portion of the lower surface of the tail towards its root, dirty white; the rest of the tail, and outsides of thighs, variegated red grey and dirty white; the upper surface of the tail banded transversely with a rufous colour. The anterior extremities, the inner sides of the thighs, the hinder legs, and all the feet, dirty white or yellowish. Length from nose to root of tail seventeen inches; length of tail eight inches and a half.

Inhabits Madagascar.—Africa and Asia. ?

Viverra Fossa, Gm. *Syst. Nat.* 91. La Fossane, Buff. *t.* xiii. The Fossan Weasel, Penn. *Quad.* 75.

Genetta Tigrina, Gmel. (Cape Genet.) Hair rather long, particularly on the middle of the back; surface colour yellowish white or yellowish grey, variegated with black stripes and spots. The distinct stripes are three in number, and commence near the hindhead; the centre one extends along the middle of the neck and near the middle of the back becomes of a very deep black, which it preserves till it reaches the root of the tail, where it terminates; the other two, one on each side, run obliquely backwards, and terminate on the posterior edges of the shoulders, being there of greater breadth than elsewhere. The spots are numerous upon the back and sides, disposed somewhat in longitudinal rows, those of the uppermost rows largest. Extremities, excepting near the body, black, each with more or less of its anterior surface, reddish white mottled with small black spots: centre of forehead blackish brown; sides of head pencilled black and white; under each eye a large white spot, another behind each nostril, and the space between them deep black; external surface of ears black at the base, reddish white elsewhere; internal surface nearly bare, excepting towards the circumference, where each has a thin coating of whitish hairs. Under part dull greyish white, pencilled or mottled with small black spots. Tail annulated alternately black and white, the black rings broadest; the tip black. Eyes brown. Woolly hair, a dull smoke colour.

Length from nose to tail twenty-two inches; length of tail about nineteen inches.

Inhabits South Africa.

Chat-Bozaam, Vosmaer, *Dissert. d' une Espece Singuliere de chat Africain, Amst.* 1771. Tigrine Weasel, Shaw, *Gen. Zool.* Musk Cat *of the Colonists.*

Genetta Felina, Thunb. (Thunberg's Genet.) Hair rather long, particularly on the centre of the back. Surface colour grey or greyish white, variegated with narrow black stripes and spots; the former are several in number, but three are particularly distinct, viz. one between the hindhead and base of the tail, and one on each side of the upper part of the neck, which, on reaching the shoulders, take a direction obliquely downwards and terminate at their hinder edges; neck and shoulders below the latter, with small black stripes and spots; sides of body with four or more longitudinal rows of small black spots, those of the two uppermost rows largest; outersides of extremities towards body spotted with black, the rest of the hinder extremities black, with the exception of a white blotch on their inner sides towards the feet, and on the upper surface of each toe towards its extremity; anterior parts of fore legs and upper surface of feet, white pencilled with black, elsewhere brownish black. From nose to hind-head a narrow indistinct brownish black stripe; eyebrows, a spot under the eyes and one behind each nostril, white; the space between the two last black; eyes brown; ears without, black at base, reddish white elsewhere; within bare, with a margin of white hairs; sides of head greyish, pencilled with black; under parts of neck and body greyish white indistinctly mottled with blackish spots; tail annulated alternately black and white, about nineteen rings; the last forming the extremity, brownish black above, whitish beneath; the black rings much narrower than the white ones. Woolly hairs dull brownish black. Length from nose to tail twenty-four inches; length of tail twenty-two inches.

Inhabits South Africa,—rare near Cape Town, common about Latakoo.

Musk Cat *of the Colonists.*

Genus Proteles. *Geoffroy.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\,\frac{1}{1}$, *cheek teeth* $\frac{5}{5}\,\frac{5}{5}$,—30. *Incisors trenchant and divided by a furrow on the outer side; the canines are sharp, and those of lower jaw a little curved; cheek teeth, both above and below, much separated from each other, the three first above false molars with a single point, the last a small tuberculous*

*tooth with three points; the cheek teeth below all false molars, each with a single point.** *Head short and broad, muzzle truncated; ears long and pointed; body formed somewhat like the Hyæna, higher before than behind; a mane on the neck and back: fore feet with five toes, hinder ones with four; tail short and villous.*

Proteles typicus. (Lalande's Proteles.) Muzzle black, thinly covered with some fine reddish fur; hair between eyes nearly black; upper and lateral parts of head pencilled black and reddish white, each hair being annulated with these colours; under surface of lower jaw black; outer surface of ears with a thin covering of blackish hairs; inner surface bare, excepting the margins, which are covered with a whitish hair. Woolly hair of neck and body very abundant, yellowish white, clouded with subrufous towards the surface, blackish towards the body; bristly hairs abundant on the upper part of the neck and centre of the back, where they form the mane, and are annulated black and white; on the sides they are scanty yellowish white, and much longer than the woolly hair. On each side of the neck a little below the mane, a longitudinal blackish stripe; on the body and shoulders a number of vertical ones; on the extremities towards the body several transverse ones of the same colour, on a ground tint similar to that of the body. Lower parts of extremities deep back in front, and on the sides, rufous white behind; throat, breast, and belly, yellowish white; tail towards root, variegated yellowish white and black; the last two-thirds appear nearly black, the hairs being only yellowish white towards their bases. Length from nose to root of tail three feet; length of tail thirteen inches: height at shoulder seventeen inches, at rump about fifteen inches. (*Male.*)

In the female the woolly hair has scarcely any of the subrufous tints which are abundant in old males, and the mane is not so black: indeed all the colours may be said to be of lighter hue.

Inhabits South Africa.—Not very abundant.

Viverra. ? Hyenoides. G. Cuvier MSS. Desm. *Mam.* 538. Porteles Lalandii Isod, Geoffroy, *Mem. Mus.* xi. *p.* 370. Nadrou Jackal *of the Cape Colonists.*

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* The teeth as described, are as they appear in adult specimens. The cheek teeth often fall out at an early age, owing to the peculiar form of the sides of the jaw.

(*To be continued.*)

SOUTH AFRICAN
QUARTERLY JOURNAL,
SECOND SERIES.

No. 2. JANUARY—MARCH, 1834. **Part 1.**

Progress and present State of Geographical Discovery in the African Continent, made from the Colony of the Cape of Good Hope.—By JOHN CENTLIVRES CHASE.

[Read at the South African Institution.]

THE last *public* Expedition dispatched from this Colony, for the purposes of discovery into the vast, unknown and interesting Continent of which it forms a part, was that of Dr. Cowan and Lieut. Donovan, in the year 1808, who were sent with instructions to cross to the Portuguese Settlements on the Eastern Coast, which failed, in consequence of the destruction of the party, but what were the causes which led to that disastrous event, or the precise scene in which it occured, has never yet been satisfactorily ascertained.

Since that period nothing upon so extended a scale has been attempted, although several plans have from time to time been laid before the Colonial Government for Expeditions to penetrate the Interior by persons of enterprize, among whom, principally, may be named the present Commissioner General and the late Capt. Birch of the Royal African Corps.

After the lapse of a quarter of a century public attention has once more been awakened within the colony to this subject, rendered more important than at the time of that fatal experiment, from the mass of information which has since been acquired, especially during the last thirteen years, and from its important results in the establishment of a highly lucrative and increasing traffic with the neighbouring savages, both beyond the northern and eastern frontiers, with whom an amicable and mutually advantageous intercourse has been arranged, as well as from the settlement of numerous Missionary Institutions even at remote places among them, charged with the promulgation of our common Faith.

The Abstract, whose title appears below,* published by an

* Abstract of Proceedings drawn up for publication by direction of the Managing Committee of the Cape of Good Hope Association for Exploring Central Africa, Cape Town. Greig, 1833. pp. 16.

Association of influential and enterprizing Colonists, I have taken as a text to elucidate in as far as possible, a topic of great interest and curiosity, and which has occupied for several weeks past, almost exclusively, the public attention, and I shall endeavour in the first place to shew,—

1st. The State of our Knowledge of the Savage Countries surrounding this Settlement previous to Cowan and Donovan's attempt at Discovery in 1808; and,

2d. The Amount which we have since acquired, in order to fix the precise boundary of our information previous to the departure of the intended Expedition now preparing to be sent out, under the direction of Assistant Staff Surgeon Dr. A. Smith.

I. The old Dutch Colonial Government, under the administration of an exclusive Company, for whose legislative capacity no subject was too elevated or too mean, who could soar to the deposition* and disposal of a foreign Sovereign and independent Prince, or sink to the regulation of a petty traffic in pickled cabbage,† and with all the viciousness inherent in, and inseparable to their grinding system of monopoly, were always *feelingly* alive to the subject of *discovery* for "*commercial purposes*," and in tracing the history of this Settlement, through its intricate, interesting, and but little known archives, we find the record of frequent attempts essayed with this view, and of enterprizes completed, of no ordinary nature, danger, difficulty, and expense.

For some time after the arrival of the admirable Van Riebeek in 1652, to establish the Settlement, little as might be expected was known of the country beyond a few miles from the first built Fort in the Table Valley, although occasional excursions were made into the surrounding and tempting fields, partly at the desire of the Government; and partly in consequence of the curiosity and wants of the settlers themselves, which brought them into contact with the Hottentot natives, from whom they learned the fertile nature of the territory on which they had intruded. The representations of the unsuspecting savages soon excited the cupidity of the new comers, and rapidly led to the occupation of their lands, their reduction to servitude, and to many scenes of cruelty and oppression, which, however,

* The Cape, during the prosperous state of the Dutch East Indian Empire, was frequently made the place of banishment for the native Sovereigns of the East; several of whom died in captivity here. The names and histories of some of these are to be found in Raffles' interesting work on Java, and the records of the Cape Council make continual mention of these wretched victims to mercantile ambition, especially from 1688 to 1736.

† Minute of Resolution of Council, dated the 17th June 1722.—Resolved, That no more *Pickled Cabbage* shall be sent to India.

there is much reason to believe have been grossly over-rated by late writers upon our early history.

The settlers soon burst the narrow confines of the Table Valley, to which they were at first limited. A war, a conquest, and a peace with the brave but weak inhabitants, in 1660, gave their conquerors the right of three miles from their landing place, and within a comparatively short period, all the country to the westward of the great mountain range of Hottentots' Holland and its connecting ridge, to some distance on the north, owned a foreign sway, and was furrowed by the Dutch ploughshare.

In 1661 and 1662, while Van Riebeck still held the reins of the infant Government, the country of the Namacqua tribes was explored by an expedition upon a considerable scale. In 1669, Saldanah Bay was visited and taken possession of; and in 1670, St. Helena Bay on the west, and Mossel Bay on the south coast, were added to the colony, the colonists having already crossed the barrier range of the Hottentots' Holland Mountains and planted their vines and fig-trees upon and beyond its eastern slopes.

In the year 1684, thirty-nine boers, with the most extraordinary temerity and success, penetrated through the whole of the Hottentot tribes and territory, and accidentally made the discovery of the Caffer nation, somewhere about the present borders of the Albany district, more than 500 miles from the head quarters of the Settlement;—their first impulse upon this occasion was to make a native prisoner, "who conducted them through a difficult road until they came upon a large body of his countrymen, who had never seen white men before: the party of boers were attacked by the Caffers with bows, arrows, and assagais; the free burghers then fired, and the Caffers made three attacks. Not knowing the power of fire-arms, they were astounded to see that some were killed, and finding blood was shed they then interposed their leathern shields, expecting these would protect them against the assailants; they found, however, after another volley, that they were struck even through these, and fled with tremendous yells, imagining," says the narrator, "nothing else than that a legion of devils armed with lightning and thunder, had invaded their country. They were astonished at the horses which they had also never before seen. In their retreat they were followed by the boers, and many were instantly destroyed."

The above extract is from a manuscript of considerable interest in the Dessinian Library, and it goes on to state the safe return of this adventurous party, after taking seven months in their journey to the Cape, where they had long been given up for lost.

The Copper Mountains near the Western Coast, were next explored in 1685, by a large party under Governor Van der Stell, consisting of 56 Europeans, 2 Macassars, 3 slaves, 6 burghers, with two pieces of artillery, many wagons, and a boat; and which afterwards, according to their own (evidently erroneous) calculation, entered the Tropical regions, they were absent fifteen weeks.

In 1683, to which date I revert in order to connect the march of discovery to the Eastward, an overland journey is reported to have been made from Port Natal to the Cape, by some wrecked mariners. The celebrated Capt. Woodes Rogers, published a very interesting account of the people, productions, and country of Natal, in 1688, which, he says, he had several times visited. In 1690 that port was purchased by the Cape Government, for 20,000 guilders, and possession ordered in 1719, but it appears never to have been carried into effect. A Captain Gerbrantz van der Schelling, "a man of intelligence and veracity" according to Kolben, is also stated, upon the same authority, to have passed to the Cape through the several Hottentot nations from De la Goa, where he had been wrecked; and a Lieut. Monas is also reported to have made an excursion to Port Natal from the latter place, in the year 1727, so that it appears an unbroken line of discovery between that bay and the Cape had been successfully traversed at this early period, and which was not retraced until the year 1829, when Messrs. Cowie and Green, to whose fatal expedition we shall hereafter have occasion to allude, performed that journey.

Governor Tulbagh, justly termed the Father of the Colony, in 1750 fitted out an extensive and costly Expedition, at the expense of the Company, under the command of an officer named *Beutelaar*, consisting of 2 burghers, 150 soldiers, 11 wagons, a great number of draught and slaughter oxen, ammunition, and provisions, with orders to explore the Caffer country, afterwards that of the Amatymboe or Tambookie Tribes, and to return through the Snowy Mountains and Camdeboo.—This extended and well ordered plan, from the haughty conduct and mismanagement of the Conductor of the Expedition, failed, and all the service he performed was that of erecting for the first time the arms of his employers, cut in stone, "at the Harbour near Zwartkops River," now Algoa Bay.

In 1761 the same spirited Governor, whose memory is embalmed in the grateful recollection of the Colonists, among whom his bones peacefully repose, and who, like many other individuals who have risen from a private to an elevated station, are remembered as the benefactors of their species (a fact honourable to our nature), imbued with a determination to enlarge the sphere of knowledge, and, at the same time, the

commerce of the country over which fortune and Providence had called him to preside, dispatched a large party to the North-west, in consequence of a farmer having reported the circumstance of his being informed by a Hottentot neighbour, of a people who lived beyond him, "*who wore linen, were of a yellow complexion, and went in and out of the mountains there, near a large river.*" From this representation it was supposed that some Portugueze Settlement had been established on the western coast, "*which Government ought to find out,*" but the expedition, after suffering great privations from want of water, and the death of their cattle, were obliged to return without satisfying their curiosity, and there is every reason to believe that the people referred to were whalers, who had touched at Angra Pequena or some other adjacent part of the coast, rather than a party from the Angolese Settlement, which some persons have imagined.

Among the several European travellers in, and writers upon the colony, up to the year 1777, Colonel Gordon appears to be the next who increased the limits of our geographical knowledge, most of the preceding visitors and residents who made journies, or recorded the information collected respecting the country up to the period of their respective literary labours, having either gained their information in Cape Town or restricted their excursions within the limits of the already known discoveries. Breyer, Ten Rynne and La Caille, are comprehended in the former; the suspected but really honest and accurate Pieter Kolben, made a few trifling journies; Thunberg reached the Zondag's or Sunday's River, in the present district of Uitenhage; and Sparrman did not penetrate so far.

The discovery of the existence of the Gariep, Great or Orange River, is ascribed to Colonel Gordon, in the year 1777; but if any truth is to be attributed to the descriptions left of the Expedition of 1685, under Van der Stell, and of that of 1761, sent out by Ryk Tulbagh, this stream must have been crossed by each of these parties, but in the records existing of the journies, it is impossible to detect the circumstance of their having passed so considerable a river, and which it is hardly possible they would have omitted to mention.

Colonel Gordon's expedition was made in search of a people, then and since known under the appelation of Briquas (*Goat Men*), of whose existence some vague information had been received at the Cape, and whose national designation had already appeared, although without geographical precision, upon Sparrman's very defective map. This people is the same as the more-than-semi-civilized Bichuana, who have since been frequently visited, and with whom we now have a most extensive intercourse. In Colonel Gordon's unsuccessful attempt

at the discovery of this people, he made the unexpected one of the beautiful, the placid, the magnificent Gariep, to which he gave the name of the Orange River, in honour of the family of Nassau, under whom he served.

Lieutenant Paterson, who had accompanied Colonel Gordon in the just-mentioned journey, succeeded him as a discoverer, and in 1779 he made an excursion to the eastward, and visited the Beka River, now within the boundary of the Territory called Neutral, (where Sir Rufane Donkin's Military Settlement of 1821 was pitched,) and which Lieutenant Paterson distinguished by the name of Becha-cum or Milk River. This country was then peaceably occupied by the Caffer tribes, from whom he received the kindest treatment. It was the fate of this writer to meet the usual meed from his fellow labourers in the field of science, and Thunberg runs him down with the observation, that he professed to travel at the expense of certain individuals, and possessed some small knowledge of botany, *but was in fact a mere gardener*; a late instance of similar kind is that of the talented and accomplished Burchell, whose Reviewer in the Quarterly chose to designate him as "a culier of simples," and to state after the publication of his intelligent and scientific work, that "simples he had indeed culled," thus,

> "Through all the gradations of life
> "Each neighbour abuses his brother."

The celebrated, almost notorious, Le Vaillant, who well knew how to decorate his descriptions with

> "a heavenly hue
> Of words, like sun-beams dazzling as they pass
> The eyes."

was the next to add some trifling tribute to our stock of information of the country, and although he has so blended fiction with truth, that it is difficult to separate them, and almost a pity to attempt it, still much more credit is due to him for accuracy than is generally accorded; his travels in 1781, there is every reason to believe, are fully authentic, and the acquisitions he proffered to natural science were of considerable value.

That awful and tremendous catastrophe which has continued to excite an extraordinary interest even up to the present moment, the wreck of the Grosvenor East-Indiaman on the second point of Natal, occurred in the next year, when a small number of the survivors, in two separate parties, succeeded after almost incredible hardships, in reaching the Cape in 1783. The description given by these sufferers, of the countries through which they passed, as might be expected from uneducated persons, exposed to every kind of peril, exhausted by the severest privations, and without the proper means of recording their impressions, is very vague and greatly

exaggerated, and it is with much difficulty, with our present, I may almost say our intimate, acquaintance of the territories they traversed, that we can occasionally recognise their route as described in their narration.

Shortly after their arrival, a party, under a Captain Müller, with two of the survivors, set out in search of the remainder of the crew and passengers, and proceeded to within five days' Journey of the wreck, leaving, according to Müller's report, their wagons "at the Hye or K'ly, a very large river, full of great stones, fresh, and near the Bambos berg." This is evidently the source of the Kei, and doubtless then for the first time visited by white people. The hostility of the Mambookies, or Amapondas, prevented the further progress of the party, which, however, fell in with three Europeans, seven Lascars, and two black women. From this fearful wreck, 18 persons only were saved out of 142 souls, of whom 108 perished by the spears of the natives, were drowned in crossing the rivers, devoured by wild beasts, or starved to death in the jungles to which they resorted for security, or pined for a few years in a hopeless captivity, never to be redeemed unless by death itself.

In 1790, rumours having reached the Cape that several of the persons who had landed from the before-named vessel, still survived, especially some ladies, the Dutch Government, with the most creditable humanity, dispatched the fearless and intrepid William van Reenen, who had already made several interesting journies into the interior, in search of these unfortunate people. Leaving the then boundary of the Colony, the Great Fish River, he took a north-eastern course across the head of the Keisi Kamma, the three chief branches of the Kei, the Zwart Kei, the Witte Kei, and the Somo, thence to the Bashee, and came upon the coast, at the Omtata River; he then skirted the shores, and fell in with an interesting tribe of Mulattoes, the descendants of Europeans wrecked at a period considerably anterior to the time of the Grosvenor, of whose history we have of late learned many particulars from our recent traders and travellers. At the Omzimvooboo, or St. John's River, he was obliged to leave his wagons, when he proceeded to a considerable distance beyond it, to the scene of the wreck, where he found many melancholy memorials of that terrible catastrophe, but without falling in with any of those saved at the time of the destruction of their vessel, who were now already dead, or so far dispersed as to be unable to take advantage of this generous effort for their restoration to civilized society. The late Capt. Riou,

"The gallant good Riou,"

translated, and gave to the public, Van Reenen's diary of this interesting expedition, which filled up, with something like an approximation towards accuracy, the Geographical outline of the countries from the Colonial Frontier to some miles beyond the St. John's River.

An American captain, Stout, of the "Hercules," wrecked near the mouth of the Beka in 1795, some remains of which are still visible there, having with his crew and passengers succeeded in reaching the shore, and enabled to gain the Settlement of the Frontier Farmers, was the next to publish an account of the country to the eastward, which he recommended to the attention of his Government as a desirable possession, commanding the Indian Seas, but it is so overdrawn, and his description of that portion traversed by himself so completely at variance with the truth, as to be utterly worthless, whether it regards the then state of the native tribes or the nature of the country.

Mr. Barrow, the able and clever writer, follows in chronological order, as an authority upon the Cape and the Southern Peninsula of Africa, whom it would be improper not to mention, although his work, celebrated as it is, adds but little to the previously ascertained *Geography* of these regions. His book, however, imparts great information, especially as regards the political advantages of the Settlement, and is the first, considered both in time and the correctness of its details, of use to the general reader. It is tinctured by an evident and unfair bias towards misrepresentation of the colonial character, which has done much injury, and led the way to subsequent traducers, who have taken it up as a text book for their representations of the people of the Settlement. With this exception, it is a faithful description of the state of the colony at the eventful time when he transcribed his impressions.

The Cape Colony having suffered greatly from a scarcity of cattle, in consequence of a long protracted drought, the Government, in 1801, dispatched Mr. Truter, Dr. Somerville, Mr. Daniells, as draughtsman, two secretaries, seven farmers, twenty-four Hottentots, and four slaves, in all forty persons, to the northern frontier, to ascertain whether it was possible to procure a supply of these necessary animals, when circumstances occurred which induced them to cross the Orange River and proceed to the Bichuana Capital, Leetakoo, then in latitude about 27, and longitude 25, and they became acquainted with the van-guard of these interesting tribes, whose existence had been darkly shadowed forth for many previous years, under the names of Briquas or Housouanas. Beyond the mere line of the actual route of this expedition, little informa-

tion of the adjacent country was obtained, and the jealousy of the tribe which they discovered, prevented their visiting the adjacent ones, whom they painted in the most terrific colours. It is to Mr. Barrow that the public are indebted for the details of this expedition, meagre as they are, which he appended to his book upon Cochin China.

Professor Lichtenstein visited the nation of whom I have just spoken in 1803, as well as the Caffers of the coast: the particulars he enters into of the history and manners of both people are highly interesting, and in general accurate; he also gives a list of the surrounding communities of the Bichuana population, not altogether correct, but as most of these have been since visited by our traders and other people, I shall reserve an account of them for the second part of this article.

As the next expedition, that of Dr. Cowan and Lieut. Donovan, opened a new æra, and the progress of our geographical knowledge has increased since that period with extraordinary rapidity, I shall here make a resting place, and before I proceed to the second division of the subject, sum up the amount of our acquisitions to that period, being 149 years since the first establishment of civilized man upon the Cape Peninsula.

The Colony itself, according to the boundaries affixed by the Proclamation of 1798, that of Lord Macartney, was separated from the Interior by the Great Fish River on the East, and a line drawn thence to the Kaga Mountains, through the Winter and Bamboo Bergen, northward to the Zekoe River, in about the 30th parallel, thence South to the several sources of the Chamtoos River, and then with an undulating line taking the direction of North-west to the Koussie River on the Atlantic Coast, in 29. 40. South latitude.

Beyond this boundary on the eastward it has been seen that as early as 1683, the Cape had been reached from Port Natal. In 1684 the Colonists had discovered the Caffer Tribes from the westward. In 1688 Natal had been described and frequently visited by Capt. Woodes Rogers. In 1719 a Capt. van der Schelling had traversed from Dela Goa to Cape Town, and in 1727 a Lieut. Monas had made an excursion from the former place to Natal. In 1750 the present Algoa Bay had been appropriated. In 1779 Paterson encamped upon the banks of the Beka. In 1782, a portion of the 'Grosvenor's' crew succeded in reaching Cape Town from within 40 miles of Natal, or about 1000 miles from the former place; and that in the same year the sources of the Kei River were first visited, and in 1790, Van Reenen repaired to the spot of the 'Grosvenor's' catastrophe, and gave the first rough sketch of the country and its rivers to that point. On the northward the Namacqua country had been tolerably well explored at different periods.

In 1777 the waters of the main stream of the Gariep or Orange River had been discovered; and in 1801 the Battlapee Tribe of the Bechuana had been visited at its city of Lettakoo, and some vague information of the surrounding country obtained. Within the Colonial limits just described, discovery had gone on as the wants or cupidity of the Settlers dictated, or the weakness of the Government permitted, but to trace which is not at present requisite.

Note.—The Writer of the present article is in hopes to be able to procure an engraving of the sketch which he prepared for its illustration, for the next number of the Journal.

Extracts from an Article entitled "On the Longevity of Trees and the Means of ascertaining it. By Professor De Candolie."

[From the Edinburgh New Philosophical Journal, October 1833.]

The longevity of certain trees is truly interesting, were it merely from motives of curiosity. If we prize every document of antiquity, why should we not attach a higher degree of importance, to know whether such a tree be the cotemporary of the oldest generations? In certain cases, this knowledge might throw light on the history of monuments, as that of monuments on the history of the trees in their vicinity. This discussion may be useful in a history of the very globe we inhabit. If the known number of veterans in vegetation increases in time to come, if we succeed in determining their age with greater precision, may we not find in such facts some means of fixing the approximate date of the last revolutions of the globe?

Every one knows, that the vegetables designed for the formation of trees may be ranged under two great series. The first, which is the more numerous, has a trunk composed of a woody body and bark: it grows by the annual addition of a new ligneous layer on the outside of the preceding layers under the bark. In consequence of these new layers being the youngest and the most outward, they have been called *exogenous* in reference to their increase, and *dicotyledonous* when we allude to their germination. The second series, on the contrary, is composed of vegetables whose trunks, very cylindrical, and seldom branching, merely present a woody body, properly speaking without bark, whose outer fibres are older and harder, and the inner younger and softer. They have been called *endogenous* in consequence of this latter circumstance, which term is employed when we allude to their growth, which is synonymous with that of *monocotyledonous*, by which they are distinguished

when we speak of their germination. We shall succinctly examine the means of determining the age of individual trees of both these classes, and conclude with a few words on vegetables more humble in their appearance, but whose longevity presents some singular ambiguities.

1. Almost all the trees in temperate, and of course in the most civilized, countries of the globe, belong to the exogenous class; and its history having therefore been more carefully studied, can supply us with the most valuable information. It is known, however, by means, of the truth of which there can be no doubt, that exogenous trees grow each year by a new woody layer, and that, in consequence, the number of concentric zones which are seen on the transverse or horizontal cut of a trunk, may give an idea of the number of years which have rolled on since the moment at which the portion of the tree where this section was made, commenced to grow. Of course, a cut at a base of a branch gives the age of that branch; that which is made at the base of the trunk, or at the neck, proves the age of the tree. If, as some maintain, there may occasionally be seen irregularities, it is a very debatable point; and it may, at least, be affirmed, that possible errors, if there be any, are so rare and so trivial, that one may confidently argue on the hypothesis, that the known number of layers indicates the number of years; of course, whenever we can procure a clean cut of a trunk, this very simple criterion is sufficient to determine the age of the tree. But the inspection of these concentric zones should be made more carefully than it has been hitherto. These zones prove the age by their numbers, but the rate of the tree's growth is discovered by the proportion of their thickness. They must not only be counted, but measured. For this object I employ the following plan, which is very simple, whenever I meet with a clean cut of an old tree, which is sufficiently sound to enable me to discover its layers. I place a slip of paper on the branch from the centre to the circumference; on it I mark with a pencil or pen the junction of each zone, noting the side of the pith, of the bark, the name of the tree, its native country, and the particular observations which it has suggested. The collection of these slips, not unlike those in the shops of tailors, gives me an exact appreciation of the growth of trees and the means of comparing them. I am in the practice of marking, in a more striking manner, the lines which indicate the tenths of years, and also of measuring the increase from tenth to tenth. My measures being taken from the centre to the circumference, give me the radius. I double the figures if I require the diameter; I sextuple them if I wish the circumference of the ligneous body. It is almost useless, except in certain cases, to make similar re-

searches concerning young trees, because on operating on the oldest trees of each species which can be obtained, we possess the advantage of judging of trees at all the stages of their growth. As it would be inconvenient to publish an engraving of these slips, which are sometimes several feet long, I give an idea of these results by means of the following table:—

TABLE of the Periods of Increase in Diameter of some Exogenous Trees, expressed in lines.

	Oak tree with pendiculated acorns, 130 years old.	Oak tree with sessile acorns, 210 years old.	Oak tree with sessile acorns, 333 years.	Larch tree, 255 years old.	Elm tree, 335 years old.	Fir tree, 120 years old.	Yew tree, 71 years old.
1 to 10 years	54	10	18	48	16	41	8
10 .. 10	20	16	33	61	44	54	11⅕
20 .. 30	54	22½	39½	58	58½	52	12
30 . 40	60	12	38	72	72	45	10½
40 .. 50	48	13½	23	46	88	35½	7
50 to 60	44	14	12½	57	74	36	12½
60 .. 70	56	10⅔	9	46	78½	18	8
70 .. 80	44	11	9½	29	66	17	
80 .. 90	32	9½	8½	30	59	13	
90 ..100	32	9½	8	24	45	13	
100 ..110	30	9½	7½	32	30	22	
110 ..120	36	9	8½	26	30	22	
120 ..130	30	9	8	20½	24		
130 ..140		9½	10	22	24		
140 ..150		10	8	23	18		
150 ..160		8½	8½	21	19		
160 ..170		9	9	20	17½		
170 ..180		10	8	19	23		
180 ..190		9	8	18	30		
190 ..200		9	7	21	34		
200 ..210		9	8	22	34		
210 ..220			7	22½	26		
220 ..230			6	21	36		
230 ..240			8	22	28		
240 ..250			8	20½	26		
250 ..260			7½		24		
260 ..270			8		17½		
270 ..280			8		26		
280 ..290			8½		28		
290 ..300			8½		29		
300 ..310			9		16		
310 ..320			8		16½		
320 ..330			8		21		

On an inspection of these figures, we will find, that trees at advanced periods of life continue to form layers which do not yield in thickness to those of a moderate age; that each species, after increasing rapidly in youth, seems at a certain age to grow at a regular rate; that, in short, we can give a tolerable explanation of such a difference, by supposing that at an early period, *i. e.* before fifty or sixty years, the roots and branches of forest-trees not being embarrassed by those near them, increase at liberty, but on exceeding this age that they do not grow so much, because they encounter the roots or branches of their neighbours; that the cause of inequalities in growth, is generally owing, either to the middle root of the tree meeting layers of good or bad soil, or because at certain periods the tree, being disincumbered of its neighbours, is able to grow at more liberty.

Similar tables of a great many species, and of individuals of each species, would afford excellent evidence of the progress of vegetation. First, we might be enabled to establish in every species its average increase annually, and thus, on finding out the circumference of an exogenous tree, we might discover its age almost to a certainty; and it should be observed that the principal differences occur during the first century; and that afterwards its growth is more uniform. Secondly, A knowledge of the average growth and solidity of one kind of wood being attained, we could form an opinion of the layers of each trunk by their thickness, if it depart less or more from the qualities peculiar to its species. We may thus be certain, that the oak No. 1. in the table is very inferior to those of Nos. 2. and 3, because the thickness of its layers is too great for the wood to have acquired its proper degree of hardness. Thirdly, If the law which I suggest be correct, that at a certain age (sixty to eighty years in oak-trees), every tree ceases to grow so rapidly, and progresses more regularly, me might deduce precise rules as to the period when we should fell certain trees. I therefore presume to believe, that tables of horizontal cuts would be of peculiar advantage, and I recommend their preparation to travellers, and those who live near extensive clearings of woods or dock-yards.

2. If we are unable to get a transverse section of trunks, there is another mode of judging of their growth, viz. to find out old individuals of each species, the date of which is known, to measure their circumference, to deduct from that, their average increase, and make use of it in calculating the age of other trees of the same species, always keeping in view, that, local circumstances excepted, the average taken of a younger tree always gives a result too great for the increase, or too small for the age of old trees. I read in Evelyn, that a Dane, called

Henry Ranjovius, planted a certain number of trees in 1580, in Ditmarsen, of various kinds, and placed stones near them, on which he engraved their dates, that posterity, as he said, might be aware of their age. It would be curious to know whether these trees are still in existence, and, in such a case, to get their circumference. It is a question that I address to Danes who are fond of science, and, in general, it would be curious to have the circumstance of every tree whose date is known, and is upwards of a century old. I would even venture to invite all those who have similar documents, either to publish them, or to communicate them to me, as these facts are very useful by their comparison with others.

3. As to trees 100 years old, it is useful to get their circumference at various known periods, in order to compare them with each other, or with other measurements of the same tree, which may have been made at an earlier or a later period. These comparisons would afford means for a more accurate calculation of the law of the growth, and appreciating the influence of the difference of age. Thus the cedar, in the Jardin de Paris, for example, measured when eighty-three years old, was 106 inches in circumference, which would indicate a mean increase of five lines annually; but it had been measured at the age of forty years, and at that time was above 79 inches round. We are thus aware that, during the first forty years, it increased $7\frac{1}{2}$ lines annually, and only $2\frac{1}{2}$ for the succeeding forty-three; consequently, if we were going to calculate the age of a very old cedar, we should not be very far wrong did we take the latter as the multiplier. Thus the cedars measured at Lebanon in 1660 by Maundrel and Pococke, which were 12 yards and 6 inches round, English measure (it may be about 1527 lines in diameter royal measure), should be about 609 years old, and nearly 800 in 1787, when they were revisited by Mr. Labillardière. This calculation is doubtful, however, as it is founded on a single example; it would be much more certain were the number of examples increased.

4. It would also be useful to take the circumference of some very old trees which we may meet, even though we are ignorant of the time when they were planted. Such measurements repeated at stated intervals, would inform us of the law of the diametrical increase of old trunks, and, compared with other measurements, would give approximate averages for estimating their ages. Thus, in Evelyn, we find, that in 1660 there was an immense oak in Wellbeck Lane, which was 33 feet 1 inch round, about 11 feet perhaps in diameter. The same oak, though greatly mutilated, existed in 1775, and was 12 feet in diameter; of course, it had increased about 144 lines in 120 years, a little more than one line annually. From this we may

conjecture that the law of increase indicated by the oak of 333 years in my Table, is followed by this one, though evidently older. If, therefore, we calculate the age of the oak in Wellbeck Lane, we see by the thickness of that of 333 years, that it must have been about 1300 years old when Evelyn lived, and more than 1400 in the year 1775.

5. Lastly, in cases where it is impossible to obtain a transversal cut of an old tree, it may happen that we may have an opportunity of making a lateral cut in the tree, in order to ascertain how much it has increased in a given number of years, and in this way find out the minimum of its mean increase. It was by this process that Adanson discovered the age of the Baobabs; he saw the extent of the growth of these trees in three centuries, and also knowing the growth of young trees, he was enabled, by striking an average, to establish the general law. The age of the Taxodium of Chapultepec in Mexico should be carefully investigated by this plan.

By means of the five plans, either singly or connected, which I have just pointed out, we may arrive at a knowledge of the age of old exogenous trees in a manner sufficiently accurate for the object of this inquiry. Let us now point out the trees to which it is principally to be directed. The greatest longevity in the vegetable kingdom ought to be found, 1st, In trees which, by their hardness, incorruptibility, or size, should most powerfully resist inclement seasons; 2d, In countries which are not exposed to ice, or to other causes which too frequently tend to destroy large plants.

A Table showing the number of known living Species of Animals at two different periods.

	Species known to Linnæus in 1776.	Species known to Naturalists in 1833.
Mammalia	221	1,100
Birds	904	6,500
Amphibia	204	1,500
Fishes	376	7,000
Mollusca	832	5,000 ?
Annelides	50	315
Crustacea	111	1,500
Arachnida	97	3,000
Insecta	2616	50,000
Enthelmintha	15	1,500
Radiaria	46	280
Medusaria	11	208
Polypi or Zoophyta	134	536
Rotatoria	8	119
Infusoria	8	291

SOUTH AFRICAN INSTITUTION.

December 4th.—The Secretary read several interesting Extracts from the Annual Report of the Natural History Society of the Mauritius for 1833, of which an abstract was ordered to be prepared and published.

Dr. MURRAY laid upon the table a detailed account of a case of Femoral Aneurism that had lately been treated by Surgeons Bailey, Abercrombie, and himself, and which he stated he considered of such interest as to deserve publication in Europe. It originated from a blow upon the artery below the origin of the Profunda, and had attained a great size before the patient arrived in town. The principal artery which carries the blood to the limb, was tied in the groin, with a view of arresting the circulation in the vessel, but upon the separation of the ligature on the 15th day after the operation, a most violent bleeding took place, which very nearly proved fatal. In consequence, the external Iliac artery was immediately tied *(for the first time in this colony)*, and thereby the bleeding was completely restrained for another fifteen days. At the end of that period it returned in an equally alarming degree, and *from the same place as before*, which, it is stated, was very unexpected, as the wound was granulating kindly. On this occasion the application of a compress and bandage effectually checked the discharge of blood, and the patient is at present walking about and doing well, notwithstanding he had nearly twice lost his life from the suddenness and violence of the bleeding. In the details of the case, several interesting Physiological, Pathological, and Practical facts are mentioned, amongst others—the dependence of the nervous energy of a part upon a due supply of blood,—the greater tendency to and frequency of secondary Aneurismal Hæmorrhage from the distal than from the cardiac end of the vessel,—and the danger of tying the crural artery, and the preference which ought be given to the operation of tying the external Iliac in all cases of Femoral Aneurism. In the general remarks which are subjoined to the case, Dr. MURRAY gives an instructive exposition of the cause of the untoward occurrences, from which he has elicited some important information that will doubtless render his paper very acceptable and highly useful to the Profession.

Dr. SMITH stated, that he had lately discovered that the little animal described by him in the Epitome of African Zoology,* under the name of *Macromerus typicus*, had been named and described in February last by Mr. BENNET, Secretary to the Zoological Society of London, under the title of *Propithecus Diadema*, and that, consequently, the latter must be considered its proper designation.

* South African Quarterly Journal, New Series, No. 1, Part 2. p. 49.

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 64.

Genus Ichneumon. *Lacepede.*

Incisors $\frac{6}{8}$, *canines* $\frac{1}{1}$, *molars* $\frac{6}{5}$ $\frac{6}{5}$,—36. *Muzzle sharp; ears short and semicircular; body elongated; anal pouch large; feet with five toes, semipalmated; tail tapering towards the point; nails curved and sharp pointed.*

Viverra. Linnæus. *Mangusta.* Olivier, Cuvier. *Herpestes.* Illiger, Desmarest.

Ichneumon Pharonis. (Egyptian Ichneumon.) Hair on neck, back, sides, and base of tail, long; on head, lower parts of neck, breast, belly, extremities, and tail near the tip, short. Colour of head, back, neck, breast, belly, tail till near the tip, and extremities towards their roots, grey, freely pencilled with black, each hair being annulated with these colours; sides of body dirty reddish white, or greyish white, with less of the black pencilling; lower parts of extremities nearly an uniform pure black; soles of feet entirely bare; space round eyes and between them and nostrils, nearly bare, and of a black colour; eyes red; outsides of ears blackish brown, insides white pencilled with black. Tail very bushy towards root, tapering towards the point, which is tufted with a brush of long jet black hairs. Length from nose to base of tail twenty-eight inches; length of tail twenty-five inches.

Inhabits Egypt and South Africa—rather rare in the latter.

Viverra Ichneumon, Lin. *Syst. Nat. p.* 84. Herpestes Pharonis, Desm. *Mamm.* 213. Mangouste, Buff. xiii. Nems and Pharaoh's Rat, *Modern Egyptians.* Commiche Muishond *Cape Colonists.*

Var ?

Length from nose to base of tail eighteen inches; length of tail fifteen inches. From nose to tip of tail a narrow moderately distinct golden yellow stripe, and another on each side of the face, which diverges from the first, passes over the eye and terminates on the side of the head. In all other respects its characters precisely correspond with those detailed in the foregoing description.

Obs. The appearances exhibited by the teeth, prove, that the *single specimen*, which has supplied me with the means of furnishing this description had not attained the adult state, and in consequence I have not considered myself yet warranted in publishing it as a distinct species, under the name of *Ichneumon dorsalis*, as it is designated in my *notes.*

Ichneumon Caffer. (Grey Ichneumon.) Hair of head, throat, breast, and extremities, short; elsewhere rather long. Colour grey, finely and freely pencilled with black, the hairs being every where annulated alternately black and greyish white: whiskers black; eyes red; outsides of ears blackish brown, insides white, freely pencilled with black; extremities towards feet black, finely pencilled with white; soles of feet, behind, covered with hair. Tail rather larger near the root than at the tip; the latter inclined to a dull reddish brown. Length from nose to base of tail seventeen inches and a half; length of tail sixteen inches.

Inhabits South Africa,—abundant in the Cape Colony.

Viverra Caffra, Gmel. *Syst. Nat.* 85. Le Mems, Buff. *Sup. t.* iii. Herpestes Griseus, Desm. *Ency. Method.* Grey Muishond *of the Cape Colonists.*

Ichneumon Madagascarensis. (Madagascar Ichneumon.) Hair of head, throat, breast, belly, and lower parts of extremities short, that of the other parts longer. The colour of upper and lateral parts of head, and of lower parts of extremities brown-red, freely speckled with black and white; the upper and lateral parts of the neck, body, and the whole of the tail, speckled being black, brown-red, and pale reddish white, each hair annulated with these colours, which are darkest upon the back; throat, and lower parts of neck, pale tawny; breast, belly, and inner side of extremities, dirty pale rufous speckled with white; woolly hair yellowish white. Tail rather thick towards root, very slender at the point; outer surfaces of ears thinly covered with short brownish yellow hair; inner surfaces more thickly, with a dull tawny sort; whiskers black; nails dark horn-coloured. Length from nose to base of tail fifteen inches and a half; length of tail about fourteen inches.

Inhabits Madagascar.

Obs. This species, in point of size and form, has a considerable resemblance to the Ichneumon Caffer, but the colours are much lighter, and when the two are compared together, the various differences are very evident.

Ichneumon tænianotus. (Natal Ichneumon.) Hair of head, under parts of neck, and lower parts of extremities, short, elsewhere pretty long. Centre of face, forehead, crown, cheeks, and space between eyes, and ears, black freely pencilled with white; muzzle, upper and lower lips, and space under lower jaw, light chesnut; outer surfaces of ears brownish, inner surfaces dirty reddish white; back and sides of neck, shoulders, anterior parts of back and sides, and outer surfaces of anterior extremities, finely pencilled black and white; the rest of back and upper parts of sides, banded transversely deep black and

yellowish white or light yellow-brown; flanks and outer surfaces of hinder extremities towards body, pencilled dull black and yellowish white; lower parts of neck, breast, belly, and inner surfaces of extremities, yellowish white; lower parts of extremities black. Tail slender, thickest towards the root; for about two-thirds of its length, pencilled black-brown and pale ferruginous; last third, nearly an uniform black. Length from nose to base of tail fifteen inches; length of tail seven inches and a half.

Inhabits South Africa,—about Natal,—*rare.*

Ichneumon urinator, Smith. (Black Ichneumon.) Figure robust. Woolly hair grey-brown, and abundant; bristly hair black, freely pencilled with reddish white, and completely conceals the other hair; extremities, and last third of the tail, nearly an uniform black; sides of muzzle reddish brown, pencilled with black; whiskers, and bristles on the eyebrows and chin black; lower lip inclined to white, outer surfaces of ears black; inner surfaces brownish; soles of feet bare; claws dark horn-coloured. Tail moderately thick at base and tapering to the point. Length from nose to base of tail twenty-two inches; length of tail sixteen inches: height at shoulder eight inches, at rump nine inches and a half.

Inhabits South Africa,—*common.*

Mangusta Urinatrix, Smith, *Zoological Journal, vol.* iv. *p.* 437. Mangusta paludinosus, Cuv. *Reg. Animal, Ed. ult. t.* 1. *p.* 158. Zwarte Muishond *of the Cape Colonists.*

Ichneumon albicaudis, Smith. (White-tailed Ichneumon.) General colour white-grey freely variegated with black. Woolly hairs soft and abundant; white grey towards surface, blackish towards body. Bristly hairs long, and coarse, annulated black and white towards roots, all black towards tips, particularly on the middle of the back and anterior and outer surfaces of hinder extremities towards body. Hair of head, of anterior extremities, and lower parts of posterior extremities, short; nose black, sides of muzzle reddish brown, pencilled with black; outer surfaces of ears brownish, pencilled with white; inner surface whitish; anterior extremities black, pencilled towards body with white, on their inner and posterior surfaces; lower portions of hinder extremities, black, with a whitish stripe behind. Tail very bushy towards root, slender towards point. The hairs of the first fourth of its length have the black annuli predominating, in the middle portions the white is most abundant, and the black is only seen through it; towards the tip they are entirely white. The greater part of the soles of the feet, particularly of the hinder ones, covered with hair; nails black: muzzle slightly curved upwards. Length from nose to

base of tail twenty-two inches; length of tail eighteen inches height at shoulder ten inches, at rump nearly twelve inches.

Inhabits South Africa,—*rare.*

Obs. This animal stands higher on its limbs than the typical species of the genus, its figure is shorter and more robust, and its teeth exhibit a slight difference in form, and are not so closely set as in the true Ichneumons. This peculiarity in addition to the state of the soles of the feet, may, when its manners and habits are better known, require it to be separated from the present genus.

Ichneumon Galera. (The Vansire.) Hair short; woolly hair brown; bristly hairs brown at their bases, elsewhere narrowly annulated black and reddish; nose sharp pointed; incisors $\frac{6}{6}$, canines $\frac{1}{1}\frac{1}{1}$, molars $\frac{6}{5}\frac{6}{5}$,—38. Length from nose to base of tail thirteen inches; length of tail nine inches and a half; the trunk only seven inches.

Inhabits Madagascar.—Guinea? Mauritius, *Griffith.*

Mustela Galera, Gm. *Syst. Nat.* i. 95. Herpestes Galera, Desm. *Mam.* 212. Vansire, Buff. xiii. Mangouste Vansire, Geoff. *Mem. de l' Institut de l' Egypte.* Madagascar Weasel, Pennant, ii. Vohangshira of Madagascar.

Obs. Mr. Verreaux is in possession of the skin of a small animal of Madagascar, which, when its osteology shall be known, will probably form the type of a genus near to the Genets. It is impossible to arrive at a certainty as to the natural form of the head, but the ears and feet are pretty perfect; the former are about an inch long, rather narrow and pointed;—the latter have a little resemblance to those of the Ichneumons. The color of the head and neck is a reddish brown, finely and freely pencilled with reddish white, each hair being annulated with that colour. The body, extremities, and tail, deep clear maronne, the latter with four black rings, the last close to the point. Length from nose to base of tail seventeen inches; length of tail eleven inches.

Genus Cynictis. *Ogilby.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{6}{5}\frac{6}{5}$,—38. *The three anterior molars of each side of both jaws spurious, the fourth carnivorous, the others tubercular. Ears short and rounded; fore feet with five toes; hinder ones with four; nails curved, pointed, and furrowed beneath; soles of the feet partly covered with hair; tail very hairy, flattened horizontally.*

Cynictis typicus. (Steadman's Cynictis.) Colour yellowish red, passing to chesnut, darkest along the middle of the back; the hairs every where, but particularly those of the upper parts of the head, cheeks, upper and lateral parts of the neck, and the sides annulated with reddish white, the base of each hair blackish: the under and lateral parts of tail, lighter coloured; tip of tail whitish; margins of lips, and space below lower jaw, inclined to white; whiskers black; eyes brown-red; nails dark

horn-coloured. Length from nose to base of tail eighteen inches; length of tail about twelve inches.

Inhabits South Africa.

Mangusta Levaillantii, Smith, *Zool. Journal, No.* xvi. Mangusta, penicillata, Cuv. *Reg. Animal, 2d ed.*

Obs. This little animal is very common in the eastern districts of the colony, and in 1826 was labelled in the South African Museum, by me, as Le Vaillant's Mangouste. Mr. Ogilby however has the merit of having discovered peculiarities in its structure which required it to be made the type of a new genus, and he will doubtless be pleased to know that its manners and habits are in support of the propriety of the separation. The advantages of effectually commemorating the type of a genus, has induced me in this instance, as well as in many others, to substitute for the specific name applied in the first instance, one, which if continued, will readily effect it.

Cynictis Ogilbyii, Smith. (Ogilby's Cynictis.) Colour of upper and lateral parts a sort of pale ochre yellow pencilled finely and freely with black and dull white, particularly on the head, upper parts of neck, shoulders, sides of body, and outer surfaces of hinder extremities towards body; upper lip, lower parts of cheeks, and neck, dull white; breast, belly, and insides of extremities, ochry white; outer surfaces of ears principally black-brown, inner surfaces pale tawny; whiskers and nose black. Tail bushy towards base, tapering towards point; upper surface towards base ochre coloured, middle parts tawny clouded with black, from each hair having a broad ring of that colour towards its tip; point, sides, and under surface, yellowish white: nails dark horn-coloured. Length from nose to base of tail twelve inches; length of tail ten inches.

Inhabits South Africa,—The Bushman flat and northern parts of Graaff-Reynet district.

Obs. It might with justice and advantage be established as a rule, that the second species discovered should bear the name of the individual who indicated the genus.

Genus Ryzaena. *Illiger.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$,—36. *Upper jaw—first and second molars spurious; third quadricuspidate, three points on the outer and one on the inner edge; fourth and fifth tubercular, two tubercles on the outer and one on the inner side. Lower jaw—first and second spurious, third and fifth tricuspid, fourth quinquicuspidate. Muzzle prolonged beyond the jaws; ears short and rounded; feet with four toes; nails formed for digging; anal pouch large.*

Ryzaena typicus. (The Meerkat.) Face, upper parts of head and neck, anterior part of back, and shoulders, greyish white freely pencilled with black; rest of back with waved transverse bands alternately black and tawny or tawny white;

sides of body dull tawny white; sides of head and under parts of neck, whitish; breast and belly, pale tawny white; extremities dull white with fulvous tinges; sides of muzzle and upper lip, whitish; whiskers, bristly hairs of cheeks and eyebrows, black; outer surfaces of ears whitish, the margins black; inner surfaces, and spaces round eyes, deep black; lower portion of muzzle dull red-brown. Tail fulvous towards base, pencilled with black; subferruginous pencilled with black towards middle, and brownish black at the tip; nails dark horn-coloured. The woolly hairs on the neck, back, and sides, very abundant, blackish towards bases, fulvous towards tips, which tint in many places shines through the bristly hairs; the latter are annulated with four rings alternately black and white; the last, or tip one, very black. Length from nose to base of tail twelve inches; length of tail eight inches.

Inhabits South Africa.—About Lake Tchad, *Denham.*

Viverra tetradactyla, Lin. Buff. *Nat. Hist.* xiii. Ryzaena, Illig. *Prod.* Suricata Capensis, Desm. *Mam. p.* 214—330. Meer Kat *of the Cape Colonists.*

Genus Hyæna.

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}$, *molars* $\frac{5}{4}$,—34. *Upper jaw,—three conical false molars; one very large, strong carnivorous tooth, with three edges on the outer side, and a small tubercle within; fifth, small and tuberculous. Lower jaw,—three false molars; carnivorous tooth biscuspidate and without the tubercle on the inside. Head short and very broad; tongue aculeated; ears moderate; feet with four toes; nails not retractile; a glandular pouch over the anus.*

Hyæna vulgaris. Desm. (The striped Hyæna.) Hair coarse, rough, and pretty long; on the back of the neck and middle of back longest, where it forms a distinct mane, some of the hairs of which, towards the tail, measure from eight to nine inches. General colour yellowish grey with transverse black stripes on the sides and extremities, those of the latter very numerous and darker coloured than the others; the hairs of the mane are grey tipped with black; muzzle and outer surfaces of ears violent brown; some black spots above and below the outer angles of eyes. Throat black; breast, belly, and inner surfaces of extremities, yellowish, spotted with brown. Tail very hairy, of a grey colour with brown tints. Length from nose to base of tail about three feet two inches; length of tail about nine inches.

Inhabits Barbary, Egypt, Abyssinia, Nubia, and Asia.

Canis Hyæna, Lin. Hyæna vulgaris, Desm. *Mam.* Foadh, Shaw's *Travels in Barbary.* Abyssinian Hyæna, Bruce's *Travels.* Hyæna *of the Ancients.*

Hyæna maculata, Thunberg. (Spotted Hyæna.) Muzzle and nose black; forehead, crown of head, sides of muzzle, and face before eyes, finely speckled with brownish red or black-brown; out surfaces of ears covered with a short tawny hair; inner surfaces, and lateral parts of head, about and below the ears, yellowish white; upper and lateral parts of neck, back, and sides, pale fulvous or whitish tawny, variegated by black or dull brownish somewhat circular spots; outer and anterior surfaces of extremities have the ground colour rather paler and the spots commonly darker; lower part of head, throat, breast, belly, and inner surfaces of extremities, dull white; the belly with some dusky spots. Tail fulvous towards root, with some black spots on its upper surface; the last two-thirds deep black, and the hair very long, which is not the case on the first third. The hair on the back of the neck and between the shoulder is longer than on the other parts of the body, turned forwards, and forms a sort of reversed mane. Length from nose to base of tail four feet four inches; length of tail sixteen inches: height at shoulder about two feet six inches, at rump about two feet two inches.

Inhabits South Africa,—common every where.

Mem. de l' Acad. de Petersb. iii. 308. H. maculata, Tem. *in Ann. General de Phys.* iii. 53. Hyæna Crocuta, Zimm. *Geogr. Gesch.* ii. 256, 149. H. Tachetée, Cuv. *Ossem. Fossil.* iv. *p.* 385. Hyæna Capensis, Desm. Tiger Wolf *of the Cape Colonists.*

Obs. The tints of the colours vary with age and season; sometimes the ground colour in young individuals is whitish instead of pale fulvous, the spots are deep black, and the under parts quite black: in still younger ones, the spots are often not distinct; the surface exhibiting rather a brindled appearance; and in very young ones the fur is of a very dark dull slate colour, verging towards black.

Hyæna fusca, Geoffroy. (Fuscous Hyæna.) Hair long and shaggy, particularly on the back of the neck, the body, and tail. Muzzle pale red-brown; forehead, crown, and lateral parts of head, reddish white pencilled with black; chin, upper part of throat, and cheeks, in a great measure black; ears pointed, their outer and inner surfaces with a thin sprinkling of reddish yellow hair; eyes dark brown; neck dirty white-yellow or pale tawny, with a few of the hairs of its upper surface annulated with black. Colour of body variegated tawny or reddish grey, and brown or blackish brown; the latter so disposed as to give the appearance of stripes or spots of that hue on the sides; some of the hairs are entirely tawny, but most of them are only of that colour towards their bases and blackish brown towards and at the points; outer surfaces of extremities towards body, principally black; lower parts of ex-

tremities yellowish white, with numerous deep black transverse bands, which nearly form rings, being only slightly interrupted on the inner surfaces. Feet whitish yellow; tail above, deep black; beneath, except towards tip, reddish yellow; nails dark horn-coloured. Length from nose to base of tail three feet ten inches; length of tail thirteen inches: height at shoulder two feet four inches, at rump about two feet.

Inhabits South Africa—not so abundant as the preceding.

Collect du Mus. H. brunnea, Tem. *Acad. de Stoch.* 1820, 1 *part, pl.* 2. Hyæna villosa, Smith, *Trans. Lin. Society, vol.* xv *p.* 462. Strand Jut, or Strand Wolf, *of the Cape Colonists.*

Genus Felis. *Linnæus.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}$ $\frac{1}{1}$, *molars* $\frac{4}{4}$ $\frac{4}{4}$, *or* $\frac{3}{3}$ $\frac{3}{3}$.—30 *or* 28. *Upper jaw—two first molars spurious, conical, and strong; third with three lobes and a small tubercle, which is wanting in some species; fourth nearly flat. Lower jaw—two first spurious. Head round; jaws short; tongue aculeated; ears triangular, and more or less pointed; pupils circular or vertical; anterior extremities with five toes; hinder ones with four.*

Felis Leo. (The Lion.) *Male.* The upper parts of the head, the chin, neck, shoulders, and belly, covered with a long shaggy blackish brown and tawny hair; on the other parts of the body, the extremities, and tail, the hair is short, of a tawny yellow colour, darkest on the back, and finely pencilled, particularly on the tail, with dull black; the point of the latter is tufted, and of a brown-black colour. The outer and inner surfaces of the ears tawny; the hairs about the base of the former, long, black, closely applied to ears and projecting beyond their margins. Eyes yellow, pupils circular; under parts of hinder extremities an uniform pale tawny; each claw concealed by a tuft of blackish hair. Length from point of nose to base of tail about six feet; length of tail about thirty-four inches: height at shoulder three feet six inches, at rump about three feet two inches.

The female is smaller and without any appearance of a mane. The young are dull tawny pencilled with black, and more or less striped and spotted with the same colour; no tuft at the point of the tail.

Inhabits Africa.

Obs. The description given is that of the South African Lion. That which inhabits Senegal and Guinea is said to be smaller, and the male to have a mane of a much lighter colour. In Griffith's translation of Cuvier's Animal Kingdom, it is stated, that "Major Smith has lately been informed by Professor Kretschmen of Frankfort, that he was in expectation of receiving from Nubia the skin and jaws of a new species of Cat, larger than the Lion, of a brownish colour, and without mane."

Felis Leopardus. (The Leopard.) Ground colour of upper and lateral parts of head and neck, back, sides, and outer surfaces of extremities, tawny or tawny white, inclined to fulvous, or even in some specimens to clear red-brown on the back; the chin, neck, breast, belly, and insides of extremities, white or whitish. The forehead and sides of the head freely mottled with small blackish spots; the neck, anterior part of back, shoulders, belly, and extremities, similarly variegated: the spots on outer surfaces of thighs and shoulders much the largest, those towards feet small. Middle of back marked with closely set spots of an oblong form, and the sides with small ones disposed in irregular circles, each of which is distinct from the others around it, and has the centre of a darker tint than the prevailing ground colour. Centre of face tawny freely pencilled with black but not spotted; lower part of muzzle reddish white, and behind each nostril a short longitudinal black stripe; edges of upper and lower lips, towards angles of mouth, black, the rest of the upper, tawny white with three narrow continuous or spotted black lines over the whiskers; the latter white intermixed with a few black bristles. Eyes fine yellow; outer surfaces of ears black with a transverse fulvous blotch near tips; some of the spots on the lower part of the neck run more or less into each other, and form something like two transverse stripes, one at commencement of breast and another about half-way between that and the chin. Tail closely set with large irregular black spots, which, on its upper surface, are separated by narrow fulvous lines, and below by white ones; towards tip it is white beneath, and above indistinctly annulated black and white; the tip itself is black. Claws yellowish white. Length from nose to base of tail about four feet ten inches; length of tail two feet eight inches.

Inhabits Africa and India,—not uncommon in South Africa.

Lin. *Syst. Nat.* Gm. i. *p.* 77. Felis Leopardus, Cuv. *Ann. du Mus.* xvi. *p.* 148. *tab.* 16. Felis Pardus, Thunb. *Mem. de l' Acad. de Petersb.* iii. *p.* 30–3. Tiger *of the Cape Colonists.*

Obs. It is difficult to find any two individuals of this species which exactly resemble each other. The ground colour is subject to considerable variation, not only in the different sexes but even in the same sex at different ages and at different times of the year. The spots are also found to vary in appearance and number, and the tail has seldom the colours arranged in the same way in any two specimens. The female as met with in South Africa is commonly about a third smaller than the male, with the ground colour generally darker, at least upon the back and upper portions of the sides. The occurrence of such discrepancies may probably have given rise to the establishment of more species than actually exist in nature, and when the Felis Leopardus, F. Pardus, and F. Pardus Antiquorum, are compared together with attention, and the variations to which the first is known to be subject, be kept in view, it will probably be admitted that they are not three species,

but one species. In the Regne Animal, tom i. p. 161, it is stated, that the *Felis Leopardus* is like the *Felis Pardus*, with the exception that it has ten instead of six ranges of black spots in the form of roses upon each flank, and of a smaller size.

Felis jubata, Lin. (The Hunting Leopard.) Colour ochry yellow studded with small black round spots, varying in size but largest on the back and outsides of thighs; belly and insides of extremities inclined to white. The hair of the back of neck and anterior part of back, rather long, and forms a small mane; between the eye and angle of mouth a black stripe; each ear with a transverse black bar towards the middle of its posterior surface, inner surface whitish. Tail fulvous above, whitish beneath, towards root spotted with black, towards point annulated alternately with black and white; the point itself white. Body slender; legs very long; claws semiretractile. Size about that of a greyhound.

Inhabits Africa and India,—*rare in South Africa.*

Jagaur, Buff. Hunting Leopard, Penn. *Quad.* i. 284. Luipaard *of the Cape Colonists.* 'Nkwi and Nkwáne *of the Bachapins.*

Felis serval, Lin. (The Serval.) The upper and lateral parts of head, the neck, back, shoulders, and extremities, fawn coloured; sides pale tawny; chin, anterior part of throat, breast, belly, and insides of extremities, whitish. The hinder parts of head, neck, and more or less of the back, variegated with four narrow longitudinal black stripes; the rest of the body and extremities rather thickly studded with black spots, principally of an oblong shape, those on the latter towards the body form irregular, interrupted rings; towards feet the spots are very small; cheeks and forehead mottled with small black spots, and a continuous or interruped narrow stripe of the same colour extends from the middle of each eyebrow and joins the outermost stripe of hindhead. Immediately before each eye a black spot, and on each side of muzzle, close to nostrils, a short blackish stripe; centre of muzzle without variegations; upper lip tawny white, with its margin towards angle of mouth black; outer surfaces of ears fawn coloured at base, black in the middle, then white, the tips black; inner surface pale tawny white; eyes yellow; outer edge of posterior surface of hinder extremities towards feet, blackish. Tail fawn coloured above, whitish beneath; towards root irregularly spotted with black, towards tip annulated with that colour, the tip itself black. Length from nose to base of tail three feet; length of tail eleven inches,

Inhabits South Africa.

Felis serval and Capensis, Lin. Felis Capensis, Thunb. *Mem. de l'Acad. de Petersb. tom* iii, *p.* 304. Tyger-bosch-Kat, *Cape Colonists.*

Felis nigripes, Burchell. (Latakoo Cat.) Colour tawny or light brown ochre, fainter on the under parts of the body: everywhere mottled with black spots, rather long than round; a few of those on the back of the neck are sometimes elongated into stripes; while those on the fore part of the shoulders join and form very black transverse stripes, of which, several surround both the fore and hind legs. The marks on the lower parts of the body are extremely black, and the under parts of the feet are the same. Tail of the same colour as the back, and confusedly spotted, at least to four inches from its base, no where annulated The top of the head is of a darker colour than the body; ears ovate, obtuse, and of an uniform grizzled dark brown, covered with very close short hairs; the anterior edge furnished with upright white hairs as long as the ear itself; hair over the eyes whiter; whiskers white. Size of the domestic Cat.

Inhabits Southern Africa,—about Latakoo.

Burchell's *Travels, vol.* ii. *p.* 592.

Felis Caffra, Desm. (Caffer Cat.) The surface colour of the upper and lateral parts of this species varies a little in different specimens, but is generally a mixture of pale tawny, greyish white and dull black, intimately blended together; on the sides some of the latter colour is so disposed as to give an appearance of many obscure transverse dusky stripes. The under parts of the neck, the breast, belly, and inner surfaces of hinder extremities, pale tawny pencilled with white. Lower parts of muzzle pale rufous; upper lip pale tawny blended with white; eyebrows and cheeks whitish, the latter crossed by two oblique reddish brown stripes; under each eye two short indistinct brownish transverse stripes; eyes yellow, and in front of each a small brownish black spot; beard white, some of the bristles black towards their bases; under lip and chin white; outer surfaces of ears rufous pencilled towards their bases with white and tawny, the tips slightly with black; inner surfaces reddish white. Outer surfaces of extremities towards body with a few deep black transverse stripes; lower portions of the anterior ones spotted with brownish black; the same parts of the posterior ones scarcely spotted; the hinder surfaces of all the feet deep black. Tail for the greater part of its length above, black slightly pencilled with grey, beneath, pencilled grey and black, towards tip grey with two or more complete black rings; the tip itself black. The woolly hairs on the top of the head are dusky black, on the body blackish towards their bases, fawn coloured towards tips; bristly hairs black, most of them annulated with greyish white. A few particularly on the hinder part of back and tail entirely black.

Length from nose to base of tail about two feet; length of tail thirteen inches. Height about ten inches.

Inhabits South Africa.—Abyssinia, *Bruce.*

Felis caligata, Tem. *Monogr. de Mamm. p.* 123. Felis undata, Desm. *Nov. Dict. de l' Hist. Nat.* vi. young.? Cuv. *Ossem. Fossil.* iv. 435. adult. Wilde-Kat *of the Cape Colonists.*

Felis Obscura, F. Cuvier. Fur of a very deep brown black with numerous transverse stripes entirely black.

Inhabits South Africa,—*rare.*

Chat noir du Cap. *Dict. des Sciences Naturelles, tom* viii.

Felis maniculata, Cretzschmar. (Small-footed Cat.) Woolly hair, a dirty ochre colour, darkest on the back and hinder parts; bristly hair black-brown, annulated with dirty white; skin of lips naked and black like the nose; bristles of beard and eyebrows glittering white, and brown at their roots; extremity of muzzle a dark ochre colour; eyes fiery yellow, and from the inner corner of each a dark stripe extends towards the nose, each of which is margined on its inner side by a white stripe, which extends to the eyebrows; space between the latter as far as forehead, fulvous; outer surfaces of ears grey, inner white; crown marked by eight narrow undulated black lines which extend along the hindhead and are lost on the neck. Cheeks, throat, and fore part of neck, shining white; the former crossed by two ochre-coloured lines which unite below the ears; the neck is surrounded by two similar coloured rings, and is also marked by spots of the same tint; breast and belly white, mottled with yellow spots; along the back a dark stripe which arises at the shoulders and loses itself on the upper surface of the tail; lower surface of tail whitish yellow, and at the point it is surrounded with two black rings. Extremities of the same colour as the body; the fore ones with five transverse black bands, the hinder ones with six distinct transverse stripes which extend round to the inner sides; each of the fore legs with two large black blotches on the inner surface; the soles and back parts of feet, clear black. Length from nose to base of tail twenty inches; length of tail nearly nine inches and a quarter: height at shoulder nine inches and a half, at rump ten inches and three quarters.

Inhabits Nubia, and the western side of the Nile, near Ambukol.

Felis Chaus, Guildenstadt. (Short-tailed Cat.) Woolly hair soft and very abundant; bristly hair thin and rough; the former dirty ochre yellow, darkest on the back; the latter similarly coloured towards body, each hair annulated towards its middle with black-brown, the tips in general grey-yellow

white, or saffron yellow, producing a variegated surface-colour of grey-yellow and white. Many of the bristly hairs have black points, and form on the sides of the belly, where many are connected, very faint perpendicular or undulated stripes and isolated spots. The bristly hairs of the back have light ochre or almost yellow coloured points, and form between shoulders and tail a yellowish stripe, which is most distinct along the course of the back bone. Nose black; above and under each eye a white spot; from inner corner of eye a black stripe extends towards the nose; edges of lips black, the other parts thereof white; bristly hairs of eyebrows, cheeks, and beard, white; amongst the latter a few black ones. Insides of ears margined on anterior edges with whitish yellow hair; outsides, greyish brown, passing to brown towards tips; the latter surmounted by a tuft of black hairs half an inch in length. Cheeks, under-jaw, throat, neck, and breast, ochre coloured; belly, whitish yellow, mottled with dark patches. The outer surfaces of anterior and posterior extremities, the colour of the body, with four or more dark transverse bands; inner sides of extremities yellow, with a large round black spot on each of the fore ones; feet ochre yellow, black behind. Tail cylindrical and greyish, point obtuse and black, with two black rings near to it, which are separated by whitish rings. Length from nose to base of tail two feet one inch; length of tail eight inches; height at shoulder fourteen inches and a half, at rump nearly fifteen inches and a quarter.

Inhabits Egypt, along the banks of the Nile,—common in Persia.

Felis Caracal, Lin. (The Caracal.) The upper parts of the head, the neck, the back, sides, outer surfaces of extremities, and tail, bright fawn coloured or wine red, pencilled freely with dull white, each hair being tipt with that colour; the chin, the fore parts of neck adjoining it, the breast, and belly, white; the inner surfaces of extremities tawny white; eyebrows reddish white; anterior parts of upper lip close to nose, and angles of mouth, white; middle portions blotched with black: beard, a mixture of black and white bristles Eyes fine yellow; ears black without, pencilled with white; within, whitish, and each tipt with a slender tuft of black hair about two inches in length Tail cylindrical, and with a few of the hairs at its point, principally reddish brown. The bases of most of the hairs on all parts of the animal inclined to white; the ground colour commonly darkest on the head, middle of back, and shoulders. Length from nose to base of tail three feet two inches; length of tail twelve inches. Height about nineteen inches.

Inhabits Africa and Asia,—not uncommon near the Cape of Good Hope.

Lugx, Aristot. *Hist. Anim.* II. c. 7. n. 31. Caracal a long queue, Buff. *Supp.* Felis Caracal. Cuv. *Ann. du Mus.* xiv. p. 154 Thunb. *Mem. de l'Acad. de Petersb.* III. 305 Roode-Kat *of the Cape Colonists.*

Genus Otaria. *Peron.*

Incisors $\frac{6}{4}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{6}{5}\frac{6}{5}$.—36. *Crowns of molars with one principal conical point and a little conical lobe before and behind it. Head short and broad; external ears distinct.*

Otaria Peronii, Desm. (Peron's Sea-Bear.) Above, the surface colour is very obscure red-grey or dull iron-grey, lightest on the head and posterior part of back; the under surface of neck and breast the same colour with an indistinct greenish tint; belly inclined to rufous; extremities rufous; upper lip and space immediately behind angles of mouth, dull white. Through the red-grey a darker tint is visible and the hairs when reversed, or otherwise separated, are found to be whitish towards their bases, blackish in the middle and reddish grey at the points; the woolly hair is a pale smoky brown. The membrane connecting the toes of the fore feet slightly scolloped at its anterior termination; the extremities of the toes with rudimentary nails; the membrane of the hinder feet terminated in five lobes, and all the toes armed with nails, the three middle ones most distinct. Length from nose to base of tail about eight feet; length of tail about five inches.

The young of this species when between two and three feet in length, is nearly quite black.

Inhabits the seas about the Cape of Good Hope.

Phoca pusilla, Lin.? P. Peronii, Bodd. *Elem.* Petite Phoque, Buff. Sea Dog *of the Cape Colonists.*

Obs Perhaps the Phoca pusilla of Linnæus may be the young of this species, and if so, the name ought to stand Otaria pusilla, instead of Otaria Peronii.

Order RODENTIA.

Two large incisors in each jaw, separated from the molars by a vacant space, the canines being wanting; molars with flat crowns or blunt tubercles. Lower jaw articulated by a longitudinal condyle; orbits not separated from the temporal fossæ; zigomatic arches small; toes variable in number, unguiculated; stomach simple; intestines long; cœcum large.

Fam. SCIURIDÆ.

Genus Sciurus. *Linn.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\frac{0}{0}$, *molars* $\frac{5}{4}\frac{5}{4}$,—22. *Upper incisors flat in front and wedge-shaped at their points; the lower pointed*

and laterally compressed; molars with tubercular crowns. Ears erect; eyes large; anterior feet with four long toes and a tubercle instead of a thumb; posterior with five long toes, all furnished with crooked nails. Tail long, villous, and flattened horizontally, or round; two pectoral and six ventral teats.

Sciurus Madagascarensis, Shaw. (Madagascar Squirrel.) The upper parts of the head and neck, the back, tail, outer surfaces of extremities, and all the feet, deep black; the cheeks, under part of neck, breast, and inner surfaces of anterior extremities, yellowish white; belly, and inner sides of hinder extremities, brown mixed with yellow. Tail distichous. Length from nose to base of tail seventeen inches; length of tail about eighteen inches.

Inhabits Madagascar.

Shaw's *Zoology* ii. *part* 1. 128. Ecureuil de Madagascar. Buff. *Hist. Nat. Supp.* vii.

Sciurus Abyssinicus. (Abyssinian Squirrel.) Rusty black above; belly and fore-feet grey. Length from nose to base of tail about two feet.

Inhabits Abyssinia.

Obs. Authors appear to consider this animal, described by Thevenot, as not a well established species of Squirrel.

Sciurus Getulus, Gmel. (Barbary Squirrel.) The head, the upper parts of the body, the legs, feet, and tail, ash coloured, inclining to red, darkest upon the upper parts of the head and back; on each side are two white or cream-coloured stripes which extend from the shoulders to the hinder legs; belly white; eyes large, and surrounded by a circle of whitish hairs. Tail bushy, each hair annulated with light and dark ash colours, which tints are so disposed as to produce a sort of striped appearance; nails black. Length from nose to base of tail about eight inches; tail nearly the same.

Inhabits Barbary, and Northern Africa.

Barbarian Squirrel, Edward, *pl.* 198. White-striped Squirrel, Penn. *Quad.* ii. 150. Baresque, Buff. *t.* x.

Sciurus Capensis. Thunb. (African Ground-Squirrel.) The face, the upper parts of the head, the upper and lateral parts of neck, the back, the upper half of the sides, and the outer surfaces of the extremities subferruginous, slightly pencilled with white which arises from some of the hairs being annulated with that colour; sides of head, under parts of neck, breast, belly, lower parts of sides, and inner surfaces of extremities, dull white; whiskers black; external ears scarcely distinguishable; a brownish red stripe under each eye; the eyebrows and sides of muzzle inclined to white, and a narrow distinct white stripe

extends from each shoulder to within about an inch and a half of the tail, about half an inch above where the subferruginous colour terminates on the sides. Upper surface of tail near its root with short hair of the same colour as the body, elsewhere the hairs are long and directed towards the sides, or distichous, white at their bases, black in the middle, and white at the tips: thus the centre portion of the upper and under surfaces appear black and the edges white Rudimentary thumb of anterior extremities with a flat nail; the toes with long, strong, slightly curved, dark horn-coloured nails. Hairs of the head and body short, rigid, and of a bristly character. Length from nose to base of tail eleven inches; tail the same length

Inhabits South Africa.—Senegal.? Central Africa, *Denham.*

Sciurus Erythopus, Geoff. *Coll. du Mus.* Sciurus Albovittatus, Desm. *Nouv. Dict.* and *Hist. Nat.* x. 110. Agiump *of the Hottentots.*

Obs. When we are better acquainted with this species we will doubtless find that it will require to be separated from the true Squirrels. In my notes it stands as the type of a genus designated *Geosciurus,* yet I do not feel myself at present warranted in publishing it under that name. I have never had an opportunity of observing it in its natural haunts, but I have been informed by persons who have, that a great number of individuals live together, and that where such families occur, numerous holes exist in the ground, and in these they reside, unless when in search of food, or enjoying the warmth of the sun. And when occupied in either of these ways they retreat with the utmost rapidity into their subterranean habitations upon the slightest alarm, and do not venture out again until the object of their fears is no longer to be discovered. They feed principally upon roots, which they dig out of the earth by means of the long and strong nails with which their toes are armed.

Sciurus Poensis. (Fernando Po Squirrel.) Surface colour of the upper and lateral parts of the head, neck, and body, and of the outer sides of the extremities, a yellow green freely pencilled with black, particularly on the back; upper and lower lips, chin, throat, breast, belly, and inner sides of extremities, yellow. Tail nearly cylindrical; hairs at the point long, elsewhere considerably shorter, each annulated alternately black and greenish yellow; all the tips black. Ears rounded, and both surfaces thinly covered with a fine short greenish yellow fur; whiskers black; front teeth a pale orange colour. The yellowish green of the upper parts is produced by all the hairs being marked by a ring of that colour near the point; the latter, together with the bases of the hairs are black. When seen at a distance the whole of the upper parts appear olive green, and the lower dull yellow. Length from nose to base of tail six inches; length of tail eight inches.

Inhabits Fernando Po.

(To be continued.)

SOUTH AFRICAN
QUARTERLY JOURNAL,
SECOND SERIES.

No. 2. JANUARY—MARCH, 1834. Part 2.

A Sketch of the Progress and present State of Geographical Discovery in the African Continent, made from the Colony of the Cape of Good Hope.—By J. C. Chase.

[Continued from page 106.]

PART II.—*Northern Interior.*

I shall now proceed to show the amount of information we have since gained respecting the Interior, in order to fix the *exact* state of our knowledge previous to the departure of the intended Expedition under Dr. Smith; and, in attempting this, in order to give greater precision, and to avoid that confusion inseparable to following a mere chronological detail of events, especially when they become numerous, and their points are widely separated, by which I should be obliged constantly to revert from one remote scene of enterprize to another, and thereby break their relative connexion, and destroy much of what I trust will be interesting in this abstract, I shall first track up the steps of our travellers and traders beyond the *northern* limits of the Colony, and then follow the clue of those who have proceeded eastwardly through the long unknown countries which skirt the shores of the Indian Ocean.

The ease with which the expedition under Messrs. Trüter and Somerville in 1801 had entered the hitherto closed regions, so distant from the Colony, the treatment they had experienced at the hands of the Bechuanas, a peculiarly mild race, and the excitement caused by the discovery of this amiable, courteous and much civilized people, induced Lord Caledon, the Governor of the Cape Colony, in 1808 to fit out a new Expedition to follow up the interesting train of discovery so unexpectedly fallen upon, and Dr. Cowan and Lieut. Donovan, along with a cortege of four wagons, and suite composed of 15 Hottentots, 1 colonist, and 2 soldiers, with every necessary and an abundance of superfluities, were despatched at an expence of Rds. 16,409, or above £2705 sterling, with instructions to cross the continent as far as the Portuguese settle-

ment of Mosambique or Sofala.—The last tidings heard from them were contained in a letter from Dr. Cowan, dated at the residence of a native Chief, named Makkrakka, in about 24° S. lat. as stated by him, but which position has since been found to be erroneous, as the sources of the Moloppo, which in Cowan's despatch is said to water that Chief's domains, lies southward of the 25th parallel.—In an account brought into the Colony by the Missionary Campbell from the Griquas or Bastards of Klaarwater or Griqua Town in 1812, it was stated that they were murdered by Makkaba, the Chief of the Bawanketz tribe, at his capital of Melita, in lat. 24. 45, and long. 26. 15; but this report has been subsequently traced to originate in the representations of one of that Chieftain's sons, who, having revolted from his father, tried to induce the Griquas, whom he thought the natural avengers of white men, to assist him in his treason, and his falsehood was fully detected, from the circumstance of his having specified a particular part of the Moloppo, into which the wagons and other articles he stated had been thrown, in order to avoid discovery; for upon a careful search made shortly afterwards nothing of the kind could be found.—From a close examination of Makkaba himself, who was visited by the Missionary, Mr. Moffatt, (a man of great shrewdness and tact, and well acquainted with the native language,) in 1824, just previous to the destruction of this Chief by the MANTATEE hordes of invaders, and the concurrent evidence of the neighbouring tribes, the party, it would appear, were well received and most kindly treated by the Bawanketz, and having found the stock of sheep they carried with them for food troublesome, they exchanged them with Makkaba for cattle, and it was the possession of this flock by the supposed murderer which naturally strengthened the suspicion occasioned by his son's testimony.—In corroboration of the innocence of the Bawanketz and their Chief, it may be at once stated, that a party of traders in 1826, who visited Sibigho, the successor of Makkabba at his kraal or village of Siloqualalie, in about lat. 25, and long. 26. 10. found indubitable evidence of the Expedition having passed safely through Melita, where they left some looking-glasses in exchange for ivory (mutual presents), and they traced them through Litabaruba, a town of the adjoining tribe, that of the Baquina within 40 miles of the Tropic. Sibigho's people averred that they heard of the unfortunate travellers for five or six days after they left them, and that when coming to a Bastard nation (probably a mixed race of Portuguese and natives) they had turned towards the sea or eastward.—At Siloqualalie these traders found a singular memorial of the visit of the Expedition in possession of Sibigho, and

which no bribe or price would induce him to part with,—the carved representation of a man on horseback, of European contour, and dressed with a hat, trousers, and jacket, which was stated to be that of one of this fated party. There is every reason, from all we have gained, to believe that they were dispersed, and several lost their lives somewhere at the back of Inhamban, to which part of the coast, upon their turning to the eastward five or six days north of Melita, according to the Bawanketz account, that route would bring them.

In consequence of the long absence of intelligence from these travellers, Lord Caledon sent a vessel to Sofala, where it collected that the party had been cut off in the kingdom of Zaïre, between Inhamban and Sofala, and only two persons escaped; and the Portuguese Governor of Mosambique having sent some trusty negroes up the country, received similar information —From some subsequent intelligence communicated by Captain Vidal, commanding one of the discovery ships on the eastern coast in the year 1824, and which is borne out by the testimony of Mr. H. Fynn, long a resident at Port Natal, a Hottentot man and woman arrived early in 1810 at the Portuguese Settlement of Delagoa, who stated themselves to belong to an Expedition from the Colony, at which Portuguese station they died, under strong suspicion, of poison, and, as has been rumoured, because they were the depositaries of a knowledge of the route from the Cape to the Portuguese Settlement; a circumstance not altogether unlikely, from the known jealousy of the Portuguese: of the existence of which feeling I believe I can give no better proof than that of the suppression of the papers of Commodore Owen, employed by the British Government to survey the eastern coast, and which were prepared for the press, but have been held back in consequence, it is said, of the strong protest of the Portuguese Ambassador.

A very interesting document has just been placed in my hands for publication by Mr. H. Fynn, to whom I have already alluded of "A Ten Years' Residence at Port Natal," in which I find the curious circumstance mentioned of the arrival in the neighbourhood of that place of a European on horseback, *who was endeavouring to reach the sea:* this took place previous to the reign of the predecessor of the late celebrated Chieftain of the Zulo nation Chaka, about the year 1810, and upon whose success in regaining his country and authority the appearance of this strange visitant had a marked influence. He came, say the natives, who treasure up the memory of this apparition, from the westward, having passed through numerous tribes, inspiring much terror from his extraordinary figure; his hat was conceived to be a part of his head, which he had

the faculty of removing at pleasure, from his shoes covering his toes, and his footstep leaving no impression of them, it was imagined he was devoid of those appendages; the singular weapon with which he was armed (a gun), vomiting out fire, smoke, and thunder, and the creature on which he was mounted (a horse), an animal never before seen, caused additional dread, and he was generally shunned by the natives as a being not of this earth. Some kraals killed cattle on his approach as a peace-offering, and retired, leaving him to consume the sacrifice, and, on returning to them, they state they found deposited upon the slaughtered beasts, beads and other trinkets; others honored him as a wizard, or a creature armed with celestial powers.—At the Omtonogale, or Fisher's river, having attended Chaka's predecessor, Tingiswaio, thus far, the stranger proceeded towards the sea, when entering the Quabie tribes, to the westward, he was murdered by order of its Chief, Pagatwaio, who conceived him to be some unnatural animal. The tradition of the visit of this individual, of whom little more of a determinate nature beyond what has been related could be collected, is constantly referred to by the Natalese, and the following song, made by the Quabies, upon Tingiswaio, who took the traveller for some distance in his train, and whose conquest, as has been said, was assisted by the alarm of this awe-inspiring auxiliary, is still sung upon festivals; the first words are intended to imitate the clatter of a horse's hoofs, and it runs thus:—

"Ite cata cata, wa mooka
Wa mooka may
Wa mooka
Na injomarne:"

which is literally translated—

Clatter clatter, he is going,
He goes with them,
He is going;
He goes with (a horse or) speed.

The time, the equipment, the anxiety of the stranger to reach the ocean shores, render it very probable that this might be one of the survivors of the Expedition of 1808; and if the circumstance of this person's having performed an operation, which is also related of him on native testimony, upon the knee of a Chief named Punjarn be correct, it is not improbable but Dr. Cowan himself might have been the victim thus ruthlessly hunted down as a monster.

Dr. John Campbell, the Missionary, follows as the next traveller in a northern direction; his journey was performed in 1812, as far as Leettakoo, now, in consequence of intestine troubles, removed 60 miles beyond its former site. His route

to that place was precisely the same as that of his predecessors, but on his retnrn he came down a northern branch of the Orange River or Gariep, which he calls the Malalareen, now more generally known as the Hart-river, a favorite and the chief residence of the Corana Hottentot tribes; this stream, 80 miles long, is said to rise from a considerable lake, in which Hippopotami are most abundant in about lat. 29, and long. 25°. 26.

Dr. Campbell was also the first to visit the junction of that river with the Ky-Gariep, as well as the confluence of the Maap, Modder, or muddy river, another branch from the southward, named by him the Alexander; and the Vaal, Yellow or Nu-Gariep, called by him the Cradock, with the principal stream the Gariep itself, the GREAT RIVER *par excellence*, according to the native designation, and the Orange-river of Col. Gordon; this main stream he traced along to the Missionary Institution of Pella, about half a degree from the coast, a desert route of 400 miles, never before visited, but devoid of anything like interest, especially to an unscientific traveller.

BURCHELL, an indefatigable, able, and generally accomplished genius, visited the same country at the same period as the last-mentioned gentleman, and made great acquisitions in various branches of natural history, in a region he considers entirely new. His intention was to have penetrated to Benguela or Loando, St. Paul on the western coast, but the alarms and refusal of his people prevented the execution of this bold and extensive plan of exploration. On his arrival at Klaarwater, or Griqua Town, in lat. 28. 50. and long. 24. 10, the principal seat of the Bastard or mixed race, finding his suite too small to carry on his journey, and obstacles being placed in the way of his attempt to induce the Griquas to join him by the resident Missionaries, he conceived the idea of returning to the colony to procure fresh assistants through an entirely new route, that from Klaarwater to the village of Graaff Reinet, which had never been trodden by white feet. This, from the most narrow policy of the Missionaries, who dreaded the effects of a nearer connexion with the Colony upon the morals of their flock, and the possibility of the Colonists possessing themselves of the wild country into which the *Griquas had themselves intruded*, was represented by them as impossible, from the ferocious character of the inhabitants, and the mountainous nature of the intervening space. But undaunted by these unfavorable reports, Burchell set out, and succeeded with comparative ease in connecting that part of the Interior with the Colony by a nearly direct route, and a regular post road has consequently been established to the Griqua and Bechuana people in this direction, to the exclusion

of the old line through the Karroo, and by the Sak-river. In his way to Graaff Reinet he discovered a river called by him the New, but now denominated the Brakke, passed through several kraals of Bushmen, whom he found friendly disposed, and much interesting country, and he arrived at Graaff Reinet in about 30 days. This place, and the whole surrounding country, was thrown into a state of the most extraordinary alarm at his approach from such a direction, and the most exaggerated stories became current among the simple farmers of this wild frontier. Reports of the approach of a white officer, at the head of a force of several hundreds of Bastards, a French army, and innumerable other absurdities, were propagated, and as readily believed, and they infused the more fright from the circumstance of the greater part of the male population of the frontier being at that time absent on the grand commando, or military expedition, to drive the Caffers out of the Zuureveldt on the south eastern part of the Colony, and 200 miles from the scene of the exploit of this peaceable visitant.—Having re-inforced his party he returned to Griqua Town by a new course, a little more to the eastward of his former route, along the Zekoe-river, and the Nu-Gariep, or Black-river, and in which he visited the remarkable passage of the stream named by him the *Narrows*, where that magnificent river is at once straitened by rocky promontories to a width of a few yards, through which it foams impatient of the unaccustomed obstruction, and bounds from it with a fury and grandeur the splendid and terrific scene of which requires to be seen to be adequately appreciated.

The importance of this hazardous exploration of Burchell is evident, from the fact that the remotest Boers' or Farmers' residence behind Graaff Reinet were then at the Groote Tafelberg, only 70 miles beyond it, and that now the whole country to the Great-river itself is occupied by them.

From Klaarwater, or Griqua Town, Burchell set out on his journey to the interior, visiting the beautiful source of the Kuruman, which leaps at once from its rocky fount a perfect river.—The city of Litakun or Leettakkoo, of which and its inhabitants, whose manners and habits are a perfect type of the race inhabiting the interior to that yet to be discovered, and probably remote line which separates them from the negroes, he has given by far the best and most complete account yet penned.—The Moshowa-river, a stream joining the Kuruman and afterwards along with the latter, reaching the Orange or Gariep, and he terminated his researches at the Chue lake, laid down by him in lat. 27. 15. and long. 24, where his people refused to proceed farther. A ridge of mountains, originating in a low chain of sand-stone hills at Klaarwater, and attaining a considerable elevation at the Kuruman, under

the name of Kamhanni, whose highest peak just above Leettakoo I would rudely estimate at about 1500 feet, runs in a direct northerly range to the Chue lake, where it is called, by eminence, among the natives, Maadje, or *the Mountain*, has been supposed by some geographers to be the commencement of the Lupata range, but which, by recent observers, has been found to be incorrect, for, after proceeding to a short distance beyond the lake, they suddenly fall off, and entirely disappear. The length of this chain, including the subsidiary hills, out of which it appears to grow, may be estimated at 200 miles. From Klaarwater, to his extreme point of observation, the hills, mountains, and rocks, Burchell states to be composed of sand-stone incumbent upon a vast, even, and underanged bed of lime-stone, which he considers primitive.

The route of this intelligent traveller, beyond his predecessors, covers a space of nearly one degree of latitude and longitude, His geographical observations have given considerable precision to our knowledge of the interior, by determining the exact situation of certain points, and his geological remarks have thrown much light on the physical constitution of the transgariepine regions. But the brightest laurels in the wreath awarded to him by public opinion are those for his contributions to natural history.

Dr. Campbell re-visited the scene of his former labours in 1819. Without any pretensions to science (unfortunately) but seconded by the good will of the Missionaries resident at Klaarwater, and their influence on the natives at their principal station, he was enabled to reach a part nearly two degrees of latitude in advance of his predecessors, and for a period of some years enjoyed the credit of being the most successful of South African travellers, whom he threw far behind him. Leaving old Leettakoo in lat. 27. 10. and long. 25, on the 15th April, 1820, he took a N. E. direction; and after an agreeable and safe journey of 19 days, reached Chuan or Kurreechane (as it is called by him), in about lat 24. 30. and long. 28. the capital of the Bamorutze tribe of Bechuana, passing through the Batammachas, an intervening clan of the same great race.—The habits of these people are so much alike, their language so similar, and have been so well described by Burchell, that it would be superfluous to repeat here what that traveller has recorded of them; it however appears that the Bamorutzi are more advanced in civilizatiou than their southern neighbours, a remark which there is reason to believe applies in an increasing degree to the various tribes of this widely dispersed people the farther they extend to the northward. Kurreechane, at the time of his visit, consisted of 16,000 inhabitants, who carried on a considerable trade with

the adjacent nations, and were particularly expert in the manipulation of metals, with which their country abounds — The streams seen by Campbell in the vicinity of this place, and for some days previous to reaching it, took an easterly course, appearing to be the sources of considerable waters, which, according to native testimony, ran to the Indian Ocean. The country is very mountainous, especially on the north, and it is evident, from this traveller's observation, he was treading a very elevated region.—Rain was abundant, this being the winter season, and great cold was experienced. The route travelled in many places was very sandy, and sometimes well covered with forests of mimosas, traversed by fine rivulets, which became much more frequent as he neared the limit of his excursion. He passed several pools and lakes, some were brackish, and one, called the Choo-y-my-Mirrebooh, in lat. 25. 50. long. 25. 50., five miles in circumference, perfectly saline, probably lying over a bed of rock salt, the most likely cause of the numerous salt-pans of the colony, and others of the interior situated several hundreds of miles from the coast.

On his way to Kurreechane, and in about lat. 25. 45. and long. 26. 15. he visited Mashow, the capital of the Battamachas, then having a population of 12,000 souls, and, like the other Bechuana towns, surrounded by extensive fields of Guinea corn; and, a little in advance of the place, fell in with the ruins of stone kraals, indicating the position of a former race, superior to the present Bechuanas, who are not accustomed to build with such substantial materials. About 40 miles beyond the city of Mashow he crossed the Moloppo, a fine river (mentioned but not seen by Burchell,) near its source; it was 30 feet wide, and 2 feet deep. This stream is known to join the Kuruman, after a long run, and with it in rainy seasons to reach the Gariep.

Dr. Campbell represents the country as being in many places covered with a rocky pavement, in the interstices of which the grass grows with great luxuriance; and the hills, being formed of sand-stone, from which it appears to be similar in its geological characters to that described by Burchell, the pavement being composed of primitive lime-stone, scantily covered with a very thin crust of vegetable mould.

On his return to Kuruman, or new Leettakoo, he made a detour upon the borders of a desert, called by the natives Kalighanny, supposed to extend from the banks of the Gariep to the 10th degree of south latitude, and from about 30 miles east of the Kamhanni range of mountains, to the country of the Damaras. A chain of wells, deeply situated in lime-stone, from which water is obliged to be laded for the use of the cattle, or marshy oäses, are reported to exist across this

southern Zahara, and traditions are extant among the Bechuanas, having made predatory excursions to tribes situated both to the north and eastward, and having in one instance attacked a nation denominated by them Mampoor, or the northern edge, where they came to a great water, where this inhabitants saved themselves and herds by retiring to an island. Water-melons are stated to be most abundant all over this desert range, and the rains are said to fall there when the days are longest.

(*To be continued.*)

Abstract of the Third Annual Report of the Natural History Society *of the* Mauritius.

[Read at its Sitting, on the 24th August 1832; and at the South African Institution.]

After noticing various circumstances which had produced an interruption in the meetings of the Society, the Report expresses the regret of the Members at the loss which the Society had sustained by the death or departure of their associates. It especially deplores, in eloquent terms, the decease of the amiable and accomplished Mrs. Telfair, whose pencil had benefited science, by preserving for publication, in the works of botanists, the exact forms and fleeting tints of the rare and interesting specimens of their science. It mentions, among other objects of regret, the departure of Mr. Bojer, and the cessation of the class of Natural History in the Royal College, which was conducted by him. After pointing out the donations it had received, and noticing the correspondence it had carried on, the Report affords the following detail of the works of the Society:—

Geology.

The correspondence of Mr. Sauzier with the Secretary, describes the different phenomena which had preceded or accompanied the eruption of the volcano of Bourbon in 1831. A stream of lava from it had, on the 25th July, reached the sea in three branches, having cut off the communication by one of the leading roads, and opened for itself a passage through the forest. At Bois-blanc a scene of great interest was presented in this operation, by the overthrow of the large old trees, which, in a blaze from the root to the summit, fell in different directions on the glowing waves of the lava, where they were at once reduced to ashes, throwing off a mass of dense and suffocating smoke. At the end of ten days it was possible to pass over the surface of the lava upon a cooled but blistered crust, under which the melted lava was still flowing.

This irruption had not taken place from any of the known apertures of the volcano, but from a new crater formed on the flank of the mountain. Since first discovered at the foot of the Piton-de-Crak till it had reached the sea, the lava occupied 30 days in traversing a space not more than three miles in breadth.

Two irruptions took place in August and in March, which had produced other three streams of lava between nearly the same points.

Mr. Julien Desjardins had, in addition to the two localities of the fossil bones of land tortoises which he formerly announced, discovered a third. It lies at La Mare Pantin, and is nearly of the same nature as the others, affording specimens of the bones on merely scratching the soil with the fingers. By researches in these deposits, he had discovered a greater variety of parts of the skeleton.

Mr. Lislet Geoffroy had communicated a note respecting the ascent of the Pieter Both mountain, by Claude Peuthé, on the 8th September, 1790. This is a sharp and conspicuous peak, of volcanic origin, almost inaccessible on account of its form. After many difficulties, this fearless sailor, by means of a rope which he contrived to pass over the rock and fix on the other side, arrived on the platform on the summit. This platform is a little inclined from north to south, and, according to his measurements, it is 27 feet in its greatest diameter. He narrates also that this rock, which seems simply balanced in equilibrio on the apex of the great cone which forms the summit of this mountain, is only 35½ feet in height. It was here, however, that the greatest danger was incurred.

Unless his success had been indicated by the display of a tricolor flag, which he hung on the end of a staff carried up for that purpose, no one would have believed that it was practicable to reach that summit.—Mr. L. Geoffroy, who had received notice of this attempt on the morning of his ascension, had taken his station at the Hotel de Genie, in the Rue de Rempart, and was able, by means of a powerful astronomical telescope, to distinguish him clearly, for he could remark a white man, even the fluttering of his dress being perceptible.

Mr. Polack communicated a short description of the island of St. Paul, in which he notices, as had been before remarked, that on the volcanic soil of the island there are streams of hot and cold water so near, that fish can be taken in the one and cooked in the other; but he does not state the important particular of the exact distance between springs of such different temperatures.

From meteorological observations made at Port-Louis by Mr. Geoffroy, it appears that during 1831 there have been

fifteen days of tempest, five in February, four in March, three in December, and one in each of the months of April, May and July. Of 129 days of rain there were 19 in the month of July, and 18 in March; in June it rained only three times, and twice in October. It was, however, in April that the greatest quantity of moisture fell, during 15 days of it, in which there was rain. This amounted to 116. 7. lines. The whole quantity during the year was 575 lines, or in round numbers, 4 French feet. The maximum of atmospheric pressure was on the 8th July, at two o'clock, P.M., and amounted to 28 inches, 5. 7. lines. The minimum was 27 inches, 11. 11. lines on the 30th December at mid-day. The centigrade thermometer reached 32° 5, on the 9th January, and on the 31st August in the morning, it was 16° 2. The air hygrometer attained its maximum of 100° 1, on the 2d April, at five in the morning; and its minimum of 75°, on the 4th February, towards the middle of the day. On the 10th April the monsoon changed, and the south-east wind returned again on the 14th October. No hurricane occurred at the Mauritius during that year; but its neighbouring island of Bourbon was not so fortunate.

Agriculture.

Mr. Geneve, senior, communicated a Memoir on the introduction of the Vanilla (Epidendrum Vanilla) into the Mauritius and Bourbon, of which several sets were received in 1817 and 1818, from the Jardin des Plantes at Paris. Several pods of it were gathered in August and September, 1831. Damp and shady grounds suit this plant best; and the trees on which it is most favorably raised are the *Erythrina Indica*, the *Laurus Persea*, the *Spondeas Dulcis*, and the *Hyperanthera Moringa*. The introduction of this plant into these islands is, as the Report proceeds to remark, another proof of the advantages to be derived from botanical establishments. It was from the Jardin des Plantes also that the coffee tree was transmitted to the West Indies, and dispersed thence over America, and from thence was the Bread-fruit tree of the Friendly Islands introduced into Cayenne.

Botany.

Mr. L. Boutons announced that many of the plants which he had described, and transmitted to Europe, had been ascertained to be new to science.

Ornithology.

Mr. J. Desjardins gave a detailed description of a specimen of *Chevalier* (*Totanus Cuv.* R.A.) the *Scolopax glottis, Lin.*, which was shot in the quarter De Flacq in December 1830. It is not known to have before occurred at the Mauritius.

Ichthyology.

Mr. Lienard, senior, read a discussion of a new species of

grammiste, to which he has given provisionally the name of *Grammiste comprimè*, and the Report takes the opportunity of pointing out a typographical error in the work of Cuvier and Valenciennes on Fishes, vol. ii. p. 206, which alters the locality assigned to the *Grammiste Oriental*, remarking that for Neros in that work we should probably read Peros Banhos, this latter name being applied to a shoal and small island of the Archipelago of Diego Chagas, situate about 400 leagues N. E. of the Mauritius, and on which several persons from the Mauritius have established fisheries. The name in Portuguese signifies the shoal of dogs; so called, in all probability, from the great abundance of sea dogs in that Archipelago. The Report then notices the *Cirrhite à bouche cloisonnée*, discovered by Mr. Lienard, which is remarkable for a membrane attached to the Palate, and forming a sort of vertical operculum in the cavity of the mouth. It then remarks that Icthyologists have long given notice of a fish having power to extend an elongated retractile snout, and to eject by this means a quantity of water upon those insects which it wished to capture. It is the *filon*, the *Sparus insidiator* of Lin. Gmel., figured by Bonaterre in the Encyclopedie Methodique, in a rude but characteristic manner. Authors notice India as its locality. Mr. Lienard, senior, has however, been so fortunate as to procure a specimen at the Mauritius, where it appears to live on the Crustacea and Polypiers. According to the report of the fishermen, it does not frequent deep waters, but is generally found along the shoals, as far as the depth of fifteen fathoms.

Mr. Lienard also brought to notice the existence in those seas of the *Trichiurus Lepturus*, (Linn.) The fishermen seemed then to have remarked this fish for the first time, a considerable shoal having found its way into the anchorage.

Mr. Lienard also has remarked, in regard to the Genus *Zanclus;* that in all the species found round the Mauritius there occurs only one filament beside the dorsal fin, instead of two, as represented in plate 177, of *Histoire Naturelle des Poissons*, Mr. Elysée Lienard communicated two descriptions of species of *Holocanthus*, which do not occur in the *Histoire Naturelle des Poissons*, and which he is convinced are new.

Mr. J. Lienard read a detailed description of a *Labrus*, which ought to constitute a new sub-genus between the *anampsés* and the *odax*.

Mr. Julien Desjardins described two new species of the proper *Chaetodons*, to which he gave the names of *Ch. Festivus* and *Ch. Chrysurus*.

CRUSTACEA.

Mr. Julien Des Jardins, in communicating to the Society that the *Cancer Raninus* of Linnæus, *Ranina Serrata*, Auct., exists

at the Mauritius, and that he was in possession of specimens taken alive upon the shore at Quatre Cocos, has also described a new species of this genus, which he named *R. Cristata.*

ENTOMOLOGY.

The order *Neuroptera* contains very few genera, or even species, when compared with the other orders of insects; but these species are numerous in individuals, being more widely distributed in the different regions of the Globe. Every one is familiar with the large long-bodied insects with four wings like gauze, and a large round head, which pass a long portion of their life in the water, in the state of a larva, having the form and aspect of the long-tailed six-footed crustacea. This has led the negroes to confound them with Crawfish, among which they are always found, and has produced the name *Maman Chevrettes.* Having escaped from this coriaceous covering, we find them circling through the air, accompanying their movements with a slight rustling noise. These are the *Libellulae* or *Demoiselles,* known in the different districts of the island under the quaint names of *Saint Denis, Serandane, Bas de soie,* and *tic tic.* Among about a dozen of species, there are three which Mr. J. Desjardins has described as new, and named them—*L. Limbata,* L. *Semi hyalina, L. Bimaculata.*

The Report remarks, in a note, that the mountain of Pieter Both derived its name from Pieter Both, of Amersfort, who held a leading station among the early Dutch voyagers in the Southern Hemisphere. Having in 1616 under his command four richly laden vessels returning to Holland he was wrecked on the rocks of the Mauritius, and perished along with his wealth. The name has undergone many transformations in the hands of different authors, as *Peter Boat, Peter Butt's head, Peter Boot, Petre Bord, Piton du bras, Petit Bois,* &c. It was successfully ascended by Captain A. Lloyd on the 8th September, just 42 years after the enterprize of Claude Penthé.

Extracts from a Letter addressed by Captain Ross, *on his return from the Polar Expedition, to the Secretary of the Admiralty.*

"We found the boats, provisions, &c." of the *Fury,* "in excellent condition, but no vestige of the wreck. After completing in fuel and other necessaries, we sailed on the 14th, and on the following morning rounded Cape Garry, where our new discoveries commenced, and keeping the western shore close on board, ran down the coast in a S.W. and W. course, in from 10 to 20 fathoms, until we had passed the latitude of 72 N., in longitude 94 W.; here we found a considerable inlet leading to the west-

ward, the examination of which occupied two days; at this place we were first seriously obstructed by ice, which was now seen to extend from the south cape of the inlet, in a solid mass, round by S. and E. to E.N.E.; owing to this circumstance, the shallowness of the water, the rapidity of the tides, the tempestuous weather, the irregularity of the coast, and the numerous inlets and rocks for which it is remarkable, our progress was no less dangerous than tedious, yet we succeeded in penetrating below the latitude of 70 north, in longitude 92 west, where the land, after having carried us as far east as 90, took a decidedly westerly direction, while land at the distance of forty miles to southward was seen extending east and west. At this extreme point our progress was arrested on the 1st October by an impenetrable barrier of ice. We, however, found an excellent wintering port, which we named Felix Harbour.

" Early in January 1830, we had the good fortune to establish a friendly intercourse with a most interesting consociation of natives, who, being insulated by nature, had never before communicated with strangers; from them we gradually obtained the important information that we had already seen the continent of America, that about forty miles to the S.W. there were two great seas, one to the west, which was divided from that to the east by a narrow strait or neck of land. The verification of this intelligence either way, on which our future operations so materially depended, devolved on Commander Ross who volunteered this service early in April, and accompanied by one of the mates and guided by two of the natives, proceeded to the spot, and found that the north land was connected to the south by two ridges of high land, 15 miles in breadth; but, taking into account a chain of fresh water lakes which occupied the valleys between, the dry land which actually separates the two oceans is only five miles. This extraordinary isthmus was subsequently visited by myself, when Commander Ross proceeded minutely to survey the sea coast to the southward of the isthmus leading to the westward, which he succeeded in tracing to the 99th degree, or to 150 miles off Cape Turnagain of Franklin, to which point the land, after leading him into the 70th degree of north latitude, tended directly: during the same journey he also surveyed thirty miles of the adjacent coast, or that to the north of the isthmus, which, by also taking a westerly direction, formed the termination of the western sea into a gulf. The rest of this season was employed in tracing the sea coast south of the isthmus leading to the eastward, which was done so as to leave no doubt that it joined, as the natives had previously informed us, to Ockullee, and the land forming Repulse Bay. It was also determined that there was no passage to the westward for thirty miles to the northward of our position.

"I may here mention that we named the newly discovered continent, to the southward, 'Boothia,' as also the isthmus, the peninsula to the north, and the eastern sea, after my worthy friend Felix Booth, Esq. the truly patriotic citizen of London, who, in the most disinterested manner, enabled me to equip this expedition in a superior style.

"Commander Ross, Mr. Thom, and myself, have indeed been serving without pay; but, in common with the crew, have lost our all, which I regret the more, because it puts it totally out of my power adequately to remunerate my fellow-sufferers, whose case I cannot but recommend to their Lordships' consideration. We have, however, the consolation, that the results of this expedition have been conclusive, and to science highly important, and may be briefly comprehended in the following words:—The discovery of the Gulf of Boothia, the continent and isthmus of Boothia Felix, and a vast number of islands, rivers, and lakes; the undeniable establishment that the north-east point of America extends to the 74th degree of north latitude; valuable observations of every kind, but particularly on the magnet; and, to crown all, have had the honour of placing the illustrious name of our Most Gracious Sovereign William IV. on the true position of the magnetic pole."

SOUTH AFRICAN INSTITUTION.

January 8, 1834.—Major Cloete placed upon the table, as a present for the Museum, a collection of Mineralogical Specimens from the Island of Tristan D'Acuna; and Mr. Hutton, through Mr. Ludwig, a small collection of Reptiles from Java. Dr. Smith called the attention of the Members to four *South African* Birds and to a *Saurian* Reptile from Swan River, all of which he considered new to science, and named and characterised as follows;

Trichophorus flaviventris. Upper parts of head, back, rump and tail, olive-brown; outer vanes of some of the quill feathers slightly edged with green; chin and throat pale straw-yellow, breast and flanks greenish yellow, centre of belly and vent, yellow; bill, legs, and toes, a dark horn-colour. Length from point of bill to tip of tail nine inches.

Inhabits the country near Port Natal.

Halycon Swainsonii. Head, back and sides of neck and interscapulars dull white, the first more or less tinted with grey-brown, the last margined behind with a broad transverse black band; back, middle of wings, and tail, blue with a green gloss, particularly the two centre feathers of the latter; shoulders, scapulars, and points of quills, black, inner vanes of several of the outermost wing feathers white towards quills; throat and centre of breast pure white, sides of breast, belly,

and vent ferruginous; bill, legs and toes light red; claws dark horn coloured. Length from point of bill to extremity of tail eight inches and a half.

Inhabits the interior of South Africa.

Halycon Senegaloides. Upper and lateral parts of head and of neck grey-green; interscapulars and scapulars green; back a clear dark blue-green; shoulders and extremities of wing feathers black, middle of wings deep blue-green, inner vanes towards quills white; tail blue-green; throat, centre of belly, and vent white; breast and sides of belly greyish, bill and legs deep red; space between eye and base of bill black. Length nine inches.

Inhabits the country about Port Natal.

Edolius Ludwigii. Black with a shining green gloss, most distinct on the upper parts and the breast; tail slightly forked; bill and legs black. Length seven inches.

Inhabits the country about Port Natal.

Lamprotornis rufiventris. Head brown with a faint purple gloss; back, shoulders, throat, and breast, a shining coppery-green, with a brownish tint; wings brown, more or less glossed with green, inner vanes of feathers white towards quills; tail deep shining green, belly and insides of shoulders ferruginous, bill and legs reddish brown. Length eight inches.

Inhabits the interior of South Africa.

Class REPTILIA.

Order SAURIA.

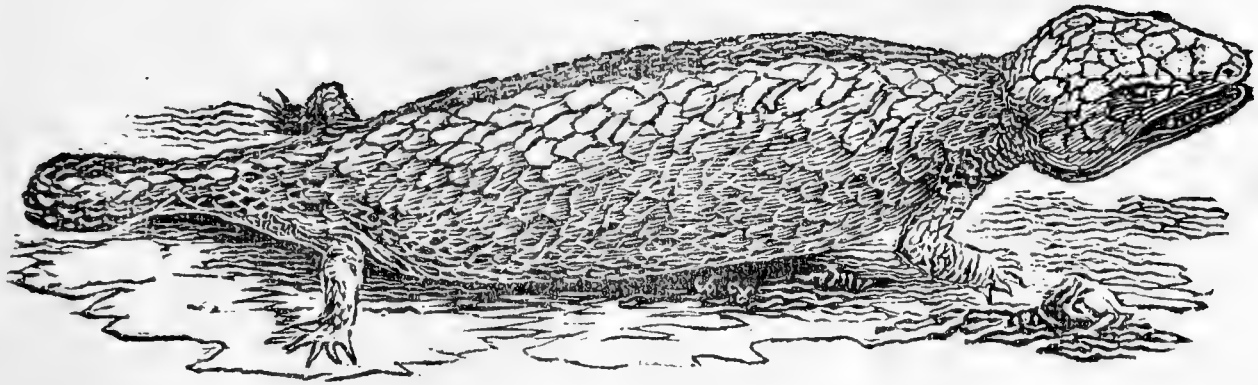
Genus Brachydactylus.

Ch. Gen.—*Head large and dilated behind; above covered with irregular-shaped scales; ears concealed under the hinder edges of cheeks; teeth conical and pointed, small in front, and large behind; tongue emarginate; neck much narrower than head; body depressed and carinated above; legs short, toes very short; tail short and club-shaped. Body and tail covered with imbricated scales, those on the back and sides very large and irregularly shaped.*

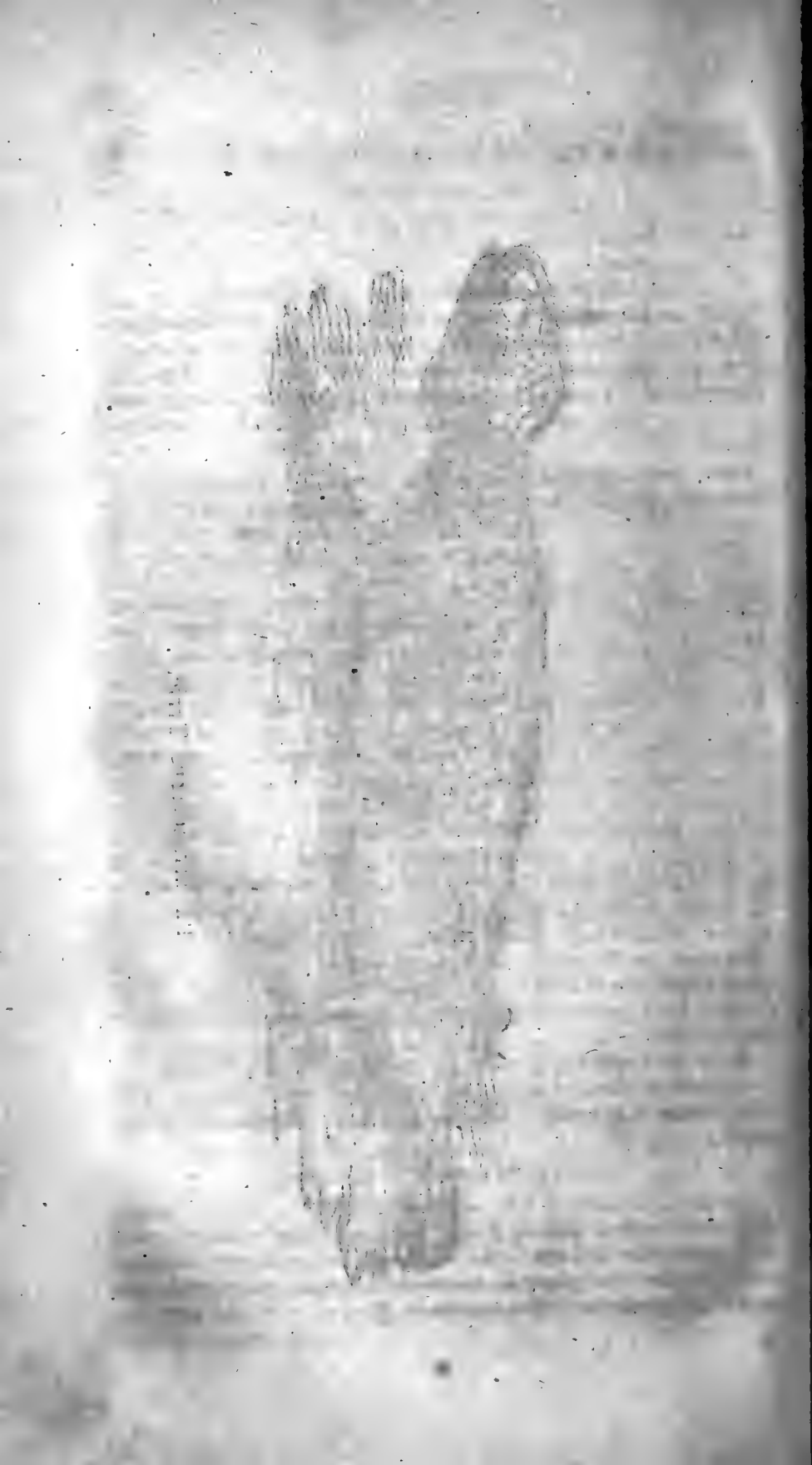
Brachydactylus typicus. Colour of head clear yellow-brown, back, sides, and upper-part of tail, dark red-brown variegated with more or less distinct transverse yellow bands; two blackish blotches on each side of neck; beneath, greenish yellow clouded with dark dusky green. Length from nose to base of tail six inches; length of tail two inches.

Inhabits Australia,—about the Swan River.

Dr. Smith remarked that, until he met with a second specimen of this Lizard, he had considered the peculiar appearance of the tail as depending upon its having been injured, but now he was satisfied from having minutely compared the two, that it was the natural form.



BRACHYDACTYLUS TYPICUS.



AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 128.

Genus Graphiurus. *F. Cuvier.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{4}{4}\,\frac{4}{4}$—20. *The first molar somewhat linear, the rest cylindrical, and with flat nearly smooth crowns. Ears large and rounded; legs short, fore-feet with four toes and a tubercle in place of a thumb, hind-feet with five toes; nails strong, curved, and acute. Tail flattened horizontally.*

Graphiurus typicus. (Cape Graphiurus.) Fur soft and of moderate length; the surface colour of the upper parts of the head, superior parts of the neck, the back, sides, and outer surfaces of thighs, pale grey variegated by an intermixture of rather long, black, somewhat rigid hairs. Centre of muzzle; spaces under eyes and at inner margin of each ear, together with an oblique stripe in front of each shoulder, pure white; upper lip, chin, throat, breast, and lower parts of extremities, either of a dull white tinted with rufous or of a pale ferruginous hue. The grey tint depends upon the tips of the woolly hairs being of that colour; on the outer surfaces of the fore legs close to body, where the tips are principally black, an irregular blotch of that colour is more or less distinct; the bases of all the woolly hairs are bluish black or a dark slate-colour; ears rounded, and both surfaces slightly sprinkled with short blackish hairs; each side of head crossed by a deep black stripe which commences at the anterior margin of the upper lip and terminates below the ear, in its course encircling the eye; whiskers long, mixed black and white. Tail subcylindrical or flattened horizontally; the hairs above and on the sides, long, rigid, and white, except towards their bases, which are blackish; beneath they are entirely black. Length from nose to base of tail six inches; length of tail about five inches.

Inhabits South Africa,—in the forests about the Knysna.

Sciurus ocularis, Smith, *Zoological Journal, vol.* iv. *p.* 439. Graphiurus Capensis, F. Cuvier & Geoff. *Mamm. Ed. Form. Max.*

Genus Myoxus. *Schreber.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{4}{4}\,\frac{4}{4}$,—20. *Molars simple with transverse projecting lines; ears large and rounded; fore feet with four toes and the rudiments of a thumb; hind feet with five toes; tail more or less villose, tufted or depressed; fur soft; no cæcum nor large intestines.*

Myoxus Avellanarius. (Common Dormouse.) Fur a clear fawn or cinnamon colour above, whitish on the under parts, the throat nearly white. Tail about the length of the body, flattened horizontally, the hairs distichous. Size of a Mouse.

Inhabits Europe and the Cape of Good Hope.

Mus Avellanarius minor, Ray. Mus Avellanarius, Lin. Sciurus Avellanarius, Erxleb. Myoxus Muscardinus, Gm. Muscardin, Buff. *Var.* b. M. Lalandii.

Obs. If the *Myoxus Lalandii*, which is said to be found at the Cape of Good Hope, be actually this species, we find it stated to be about twice the size of an European specimen.

Myoxus murinus. Desm. (Cape Dormouse.) Fur rather long and very soft; the surface colour of the upper parts of the head and neck, the back, the sides, and the outer surfaces of the extremities towards the body, pale brown-grey or mouse-coloured; the sides of the face below the eyes, the under parts of the neck, the breast, belly, and lower parts of extremities white; whiskers long and blackish; colour immediately in front of each eye inclined to black; ears thin, rather rounded, and almost bare. Tail flattened horizontally, and of a dark mouse-colour, variegated on the sides by an intermixture of white hairs. In some specimens the edges of the lips, the throat, the breast, the insides of the fore legs, and even the feet, are tinted with ferruginous. Length from nose to root of tail about four inches; length of tail about three inches and a quarter.

Inhabits South Africa,—in forests.

M. Erythrobronchus, Smith, *Zoological Journal, vol.* iv. *p.* 438.

Obs. The Dormouse which was carried from the Cape by De Laland, and which has been considered in Europe to be a variety of the Myoxus Avellanarius, is probably no other than the present species, if so, the common Dormouse is probably not found here.

Genus Petromys. *Smith.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}$ $\frac{0}{0}$, *molars* $\frac{4}{4}$ $\frac{4}{4}$,—20. *Incisors smooth in front, the upper ones notched on the posterior surface at the points; molars with slightly concave crowns, the inner edge of each in the upper jaw, and the outer edge of each in the lower, cut by a deep transverse fissure. Muzzle rather acute; ears moderate, roundish, and nearly naked. Tail shorter than the body, and thickly covered with rigid hair, tip tufted; fore-feet with four toes; hind-ones with five; nails short, curved, and covered by rigid hairs; form robust.*

Petromys typicus. The colour of the upper and latter parts of the head and neck, the shoulders, anterior part of the back, and outer surfaces of anterior extremities towards body, a dull

brownish grey or an obscure pale slate colour freely pencilled with tawny, and slightly with black; the rest of the back, sides, and posterior extremities, dull chesnut. Chin, under parts of neck, breast, belly, and the lower parts of the anterior extremities, dull white, more or less tinged with tawny or pale rufous; apex of muzzle deep chesnut; whiskers long, rigid, and black; ears thick, blackish, and almost naked. Tail cylindrical, and thickly covered with stiff black hairs, which are rather long at the point, elsewhere short; cutting-teeth of a yellowish tint. The bases of most of the hairs are of a bluish grey colour. The surface colours vary considerably in different individuals, but the upper and anterior parts always exhibit more or less of a bluish grey tint, and the hinder parts a distinct or obscure chesnut shade. Length from nose to root of tail about eight inches; length of tail about six inches.

Inhabits South Africa,—rocky mountains of Namaqualand.

Obs. I have placed this genus in the Sciuridæ, under an impression, that when the various species which are at present included in the genus *Sciurus* shall have been properly examined, several subdivisions will require to be established, some one of which may probably stand in close affinity with *Petromys*.

Fam. MURIDÆ.

Genus Arvicola. *Desmarest.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{3}{3}\,\frac{3}{3}$,—16. *Molars without true roots and with flat crowns, marked by zig-zag plates of enamel; the first tooth the largest; ears short, round, and hairy; fore-feet with four toes and short nails, hind-feet with five toes closely covered with hair. Tail about half the length of the body, ringed, and more or less covered with short stiff hair.*

Arvicola Niloticus, Desmarest. (Egyptian Vole.) Ears large and round; thumbs of fore-feet very small; hairs rigid and black towards their bases; surface colour of back red-brown, of under-parts yellowish grey; muzzle reddish; the inner sides of extremities whitish; the toes reddish grey; tail moderately hairy, and almost as scaly as in the rat. Length from nose to base of tail seven inches; length of tail four inches and a half.

Inhabits Egypt,—about the sides of rivers.

Hypudaeus Niloticus, Brants. *Geslacht der Muizen, p.* 87. Lemus Niloticus, Geoffroy, *Description de l' Egypte.*

Genus Otomys. *Smith.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{3}{3}\,\frac{3}{3}$,—16. *Upper jaw—incisors plain in front or each with a longitudinal groove; the first molar the largest, the last much the smallest, the crowns, particularly of the first and second, much broken by subcircular or irregular*

concavities, each of which is surrounded by a narrow raised rim. Lower jaw—incisors plain in front; the first molar the largest, the last much the smallest; the crowns marked and divided somewhat like those in the upper jaw. Head large and deep; muzzle narrow; ears large; legs short; fore-feet with four toes; hind-feet with five, the innermost one very small; tail short and covered with very short hair; form rather robust.

Otomys typicus, Smith. Hair rather long and very soft; colour above a very pale red-brown, here and there faintly clouded or sprinkled with black; cheeks a pale fawn-colour; centre of muzzle freely sprinkled with dark bluish black; upper lip, spaces about angles of mouth, chin, lower surface of neck, belly and extremities dull white; tail thinly covered with very short, fine reddish white hair; ears very large, and both surfaces thinly sprinkled with fine short hair, which on the inner surfaces whitish and on the outer brownish black. Superior incisors yellowish, each with a well marked longitudinal groove on its anterior surface; lower ones white and smooth. Whiskers composed of long fine hairs, some white and some black. The hairs of the head and upper parts of the body are of a dark slate colour towards their bases, those of the lower parts are of the same colour, only lighter. Length from nose to base of tail four inches; length of tail an inch and a half.

Inhabits South Africa,—District of Graaff-Reinet.

Otomys albicaudatus, Smith. Hair rather long and very soft: colour above grey with a faint brownish tint, and slightly pencilled with black; cheeks, chin, and under-surface of neck dull white-grey or pale brown-grey; upper lip, lower parts of sides, belly, vent, and extremities dull bluish white, the latter in some specimens reddish white; claws nearly colourless, and completely covered by long white hair; tail cylindrical and closely covered by very short fine white hair; ears very large, their points rounded, their inner surfaces thinly covered with fine short dull white hair, their outer surfaces with a sprinkling of short blackish hair. Whiskers reddish white, some of the hairs black towards their bases. Incisors yellowish and not grooved. All the hairs on the head and body dark slate-coloured towards their bases. Length from nose to root of tail five inches and a half; length of tail two inches.

Inhabits South Africa,—District of Albany.

Genus Euryotis. *Brants.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{3}{3}\,\frac{3}{3}$,—16. *Incisors of upper jaw each with a longitudinal groove in front, those of the lower jaw grooved or plain; molars with true roots, the crowns com-*

posed of narrow very distinctly marked transverse laminæ, each lamina with a more or less distinct central furrow extending from its outer to its inner extremity; the first molar of upper jaw the smallest, the third the largest; in the lower jaw the first is the largest and the third the smallest: ears large and rounded; upper lip cleft; form robust; legs short, anterior feet with four toes, posterior ones with five; tail much shorter than the body, surrounded with scaly rings, and freely covered with short rigid hair.

Euryotis typicus, Smith. Hair long and soft on the body, rather shorter and more rigid on the head. The upper and lateral parts of the head and body tawny or yellowish brown, freely pencilled with black, which is produced in some measure by the tips of many of the tawny-coloured hairs being of a blackish colour, but chiefly by a free intermixture of a series of entirely black hairs which are longer and more rigid than the general covering; under-parts and extremities dull white or yellowish white with a dusky coloured tint shining through it. Front teeth nearly orange-coloured, and each with a longitudinal groove on the anterior surface. Whiskers pale black; ears rounded, projecting considerably beyond the hair and rather fleshy; inner surfaces with a thin covering of very short tawny hair; outer surfaces, especially towards margin, with a sprinkling of short, blackish hair; claws light horn-coloured and but slightly covered with hair; tail with scaly rings and a scanty covering of short rigid hairs, above brownish black, beneath yellowish or tawny white. The bases of most of the hairs on the body slate-coloured. Length from nose to base of tail seven inches and three quarters; length of tail about four inches.

Inhabits South Africa,—marshy grounds,—near Constantia, and along the western coast.

Euryotis irrorata, Brants. *Het Geslacht der Muisen, Berlyn*, 1727. Mus irroratus, Licht. Vley-muis *of the Cape Colonists.*

Euryotis unisulcatus, F. Cuvier. Hair of body long and moderately soft, of head and sides of neck short and rigid. The upper parts of the head, the back, and the upper portion of the sides pale tawny or light yellowish brown, freely pencilled or sprinkled with black, the latter principally produced by an intermixture of hairs which are entirely black and much longer and more rigid than those which are marked with the tawny colour: the upper lip, the sides of the head, and neck, the lower parts of the sides, the chin, the throat, the breast, the belly, and the extremities, dull white, pencilled more or less distinctly on the sides of the head and neck, and on the

outer surfaces of extremities towards body, with brown-black or dusky; whiskers black; ears rounded and fleshy, inner sides towards margins thinly covered with a short tawny hair, outer sides towards margins with a fine, short, blackish hair; tail with distinct scaly rings and a thin covering of short rigid hair, above brownish black, beneath tawny white; claws pale horn-coloured and slightly covered with dull white hairs; front teeth yellowish, the upper ones, each with a longitudinal furrow towards its external edge. The bases of all the hairs of the body, except the long black ones, slate-coloured; many of those, which are partly tawny, have the tips brownish or dull black. Length from nose to base of tail seven inches and a quarter; length of tail three inches and a quarter.

Inhabits South Africa,—District of George.

Euryotis Brantsii, Smith. *Male*:—Hair of body of moderate length and rather rigid, of head and sides of neck short and very rigid. The muzzle, forehead, top of head, back of neck, and back, reddish white or greyish white, here and there tinted strongly with fulvous, and every where freely pencilled with black, the latter is produced principally by most of the hairs being tipt with that colour, though partly also from a slight intermixture of hairs entirely black and longer than the general covering. The sides of head, neck, and body dull white; outer surfaces of extremities and feet white with a tawny tinge. Front teeth yellow, upper ones, each, with a distinct longitudinal groove in front near the outer edge, lower ones with a very slight groove almost upon the edge. Whiskers large and blackish; ears rounded and rather fleshy, inner surfaces with a thin covering of short tawny hair, outer surfaces with long whitish hair towards their base, and short tawny and black hairs towards circumference; claws nearly black and without covering; tail with a moderately dense coating of short rigid hair, blackish above and tawny or tawny-white beneath. The bases of the hairs of the body blackish blue. Length from nose to root of tail eight inches; length of tail three inches and a half. *Female*.—The upper parts strongly tinted with a pale fawn-colour, and scarcely pencilled with black; the sides reddish white, the under-parts and extremities dull white.—Rather smaller than the male.

Inhabits South Africa,—plains in the interior.

Vlakte Muis *of the Colonists*.

Note. This species is named in honour of Mr. Brants, who, in his excellent Treatise on the *Muridæ*, first indicated the genus. The rage for changing names has led to the substitution of Otomys for Euryotis, which, however, ought not to be admitted considering the last has the claim of priority.

Genus Ctenodactylus. *Gray.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{3}{3}\,\frac{3}{3}$,—16. *Upper jaw—Incisors stout, square, and truncated; molars oblong, flat, and plain, on the inside, with one indentation on the outer side. Lower jaw—Incisors slender and pointed; molars somewhat diamond or lozenge-shaped, with one indentation between each of the four angles, but more particularly of the first and second. All the feet with four toes and small curved nails, the two innermost toes of the hinder feet have each a double small deeply pectinated bony plate on its inner side. Tail very short.*

Ctenodactylus typicus, (Masson's Comb-Rat.) Fur soft and silky; the upper parts pale fulvous brown; the hair very thin, pale lead-coloured at the base, pale fulvous at the end, with very short blackish tips, especially on the head; the chin, throat, inner sides of limbs, and beneath, whitish, with the same lead-coloured base to the hairs. The head rather small, and densely hairy; muzzle very small and black; mouth rather small; the cutting teeth exposed, rounded, smooth, and white; whiskers twice as long as the head, rigid and black; two or three long slender bristles over the eyebrows; eyes moderate, rather nearer the ears than the end of the nose; ears rounded, externally covered with dense short fur like the body, internally nakedish, black, and with a distinct helix. The limbs short; feet covered with short rather depressed hair; fore feet short; toes free, the two middle ones nearly equal, the inner rather shorter, and the outermost shortest of all; the claws short, subequal, incurved, black, and not so long as the hinder ones; the hinder feet large with naked soles; toes free, the three inner equal, the outer rather the shortest. Tail cylindrical, ending in a parcel of rigid black-tipped hairs. Length from nose to base of tail nine inches; length of tail one inch.

Inhabits Barbary.—South Africa.?

Mus Gundi, Rothman. Arctomys Gundi, Gm. *Syst. Nat. vol.* i. *p.* 163. Gundi Marmot, Penn. *Zool. vol.* ii. *p.* 137. Ctenodactylus Massonii, Gray, *Spicilegia Zoologica, p.* 11.

Obs. Although Mr. Gray remarks, that a specimen of this animal is marked in the British Museum as from the Cape of Good Hope, yet I am inclined to believe it does not occur here. The description given by him of the peculiar digital appendages, which occur on the hinder feet, and which have been entered amongst the generic characters, does not exactly correspond with that of the accurate observer and describer of animal structures, Mr. Yarrell, it may be necessary to record the differences, and that cannot be better done than in the words of the latter, as we find them in the Proceedings of the Committee of Science and Correspondence of the Zoological Society of London, part i, p. 49. Speaking of the Ctenodactylus Massonii, Mr. Yarrell observes,—"The general external resemblance to the well-known *Lemmings* has been noticed, but

these examples have but four toes on each foot, with one small naked pad under each toe: the two middle toes are the longest and equal, the outer toe the shortest, the inner toe intermediate in length, and on the hind feet of remarkable structure. Immediately above a short curved nail there is a transverse row of horny points forming a pectinated apparatus; above this is a second parallel row of stiff white bristles; and over this, a third row of bristles, which are much longer and more flexible: there are thus three distinct parallel rows of points of unequal firmness. The toe next the inner one has two small fleshy tubercles above the nail, covered by two rows of bristles, the under one short, the upper long; it has no horny points. The two outer toes, without tubercles, have each only one tuft of long bristles." The same Naturalist, in page 50 of the work quoted, makes the following valuable remarks:—"Some peculiarities observed in these little animals are worthy of notice. The molar teeth, as before stated, presented the singular anomaly of those of the upper jaw being different in their structure and surfaces from those of the lower jaw. The former, in their crowns, are very similar to those figured by M. F. Cuvier, as peculiar to his genus *Helamys* (*Pedetes*, Illig.); while those of the lower jaw somewhat resemble the teeth of the various species of *Arvicola*. The stomach, in form and pyloric contraction, is like the same organ in the *Lemmings* (*Lemmus*), *Jerboas* (*Dipus*), and *Gerbilles* (*Gerbillus*). The *cæcum* resembles that of the Guinea-Pig (*Cobaya*), *Agouti* (*Dasyprocta*), and *Marmot* (*Arctomys*); while the sacculated form of the *colon* is found in the common *House-Rat* (*Mus decumanus*, L.)"

Genus Mus. *Linnæus.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}$, *molars* $\frac{3}{3}$,—16. *Molars with tuberculous crowns; ears oblong or rounded; anterior feet with four toes and a wart, hind-feet with five toes, all armed with nails; tail long, naked, and scaly; scattered hairs longer and stiffer than the fur intermixed with it, and which in some species amount to a kind of spines.*

Mus decumanus, Pallas. (Norway Rat.) Fur above, grey-brown pencilled with black; sides reddish white; belly dull white. Length from nose to base of tail about eight inches and a half; length of tail about seven inches.

Inhabits South Africa.—Houses in the Colony,—the open country immediately around Port Natal.

Mus decumanus, Pallas, *Glires* 91, 40. Desm. *Mammal.* *p.* 299 *and* 473.

Obs. This species, not originally a native of Africa, is subject to considerable variation, both in respect of size and colour.

Mus variegatus, Brants. (Grizzled Rat.) Hair closely applied to the skin and of moderate length, towards the bases bluish black, towards the points brown, grey, or yellowish, which tints produce a variegated colour. Body moderately long; ears covered with short brownish blue hairs; forehead flat; molars with tuberculous crowns and true roots; tail short and so thickly covered with short rigid hairs that the rings are

scarcely visible; feet covered with short hair of the same colour as the back, that on the toes darker. The thumb of the fore-foot is very short and with a rudimentary nail. Length from nose to base of tail seven inches and a half; length of tail about five inches.

Inhabits Egypt, Nubia, and Arabia,—in the fields.

Hypudaeus variegatus, Licht. *Doubl. Verz. p.* 2.

Mus Pumilio, Sparm. (Cape Striped Mouse.) Hair moderately long and rigid. The colour of the upper and lateral parts of the head and neck, of the back, sides, and outer surfaces of extremities towards body, subferruginous or yellowish brown, freely pencilled with black and sparingly with white; chin, lower parts of neck, breast, belly, and inner surfaces of extremities, white, more or less mottled with rufous; hind-feet a pale ochre-colour. Between the hind-head and the root of the tail four parallel, longitudinal, black stripes, and three dull white or reddish white ones; ears moderate and rounded, their inner surfaces covered with short, rufous or chesnut-coloured hair, their outer surfaces by a mixture of short rufous and black hairs; and at the base of each a more or less distinct white spot; eyes large, deep black-brown, and surrounded by a narrow indistinct circle of white hairs; whiskers long and black; upper incisors white; tail scaly, annulated, and sparingly covered with short hair, black above, and ochry-coloured on the sides and under parts. The hairs of the upper and lateral parts of the body are blackish towards the bases, subferruginous or whitish towards the middle, and most of them with black points; the bases of the hairs on the under part are a dull black. Length from nose to base of tail five inches; length of tail four inches.

Inhabits South Africa,—common in most parts of the colony.

Var. A.—Greyish pencilled or variegated with subferruginous and white colours; a distinct white ring round each eye; outer and inner surfaces of ears covered with fine short rufous or chesnut-coloured hairs, those of the former intermixed with white ones. Upper incisors a dull orange-colour. Hairs moderately rigid.

Inhabits South Africa,—Namaqualand,—rather rare.

Var. B.—Only a single black stripe along the centre of the back.

Inhabits South Africa.

Lineated Mouse, Shaw, *Gen. Zoology, vol.* ii. *part* 1. *p.* 69. *t.* 133. Striped Mouse *of the Cape Colonists.*

Obs. In this species not only the shades but even the very colours themselves vary considerably in different specimens: those described are the most prevailing.

Mus Alexandrinus, Geoff. (Rat of Alexandria.) Head shorter than in the Mus Decumanus; ears larger, brown, and quite naked; nose sharp; whiskers long and black; upper parts of body grey-brown with a reddish tint; under-parts ash-grey passing into yellow; tail scaly, nearly naked, and marked by 130 or 140 rings. The bases of the hairs are slate coloured, and the tips of most of them are of a rusty tint; the longest hairs have brown points, which are compressed and marked with a furrow along the middle. Length from nose to base of tail six inches; length of tail eight inches.

Inhabits Egypt,—about Alexandria.

Geoff. *Mem. de l' Hist. de Egypte, pl. 5. fig.* 1. Desm. *Mamm. No.* 475. Brants, *Het Geslacht der Muizen, p.*106.

Mus musculus, Linnæus. (Common Mouse.) Fur yellowish brown above, mixed with black hairs; beneath iron-grey. Length from nose to base of tail three inches and a half; length of tail about three inches.

Inhabits South Africa,—in houses.

Mus domesticus vulgaris, Ray. Mus Sorex, Briss. *Regn. Animal, p.* 169. Mus musculus, Linn. *Syst. Nat. ed.* 12. Erxleb. Bodd. Gmel. Schreb. *tab.* 18 Desm. *Mamm. No.*478. Le Souris, Buff. *Hist. Nat.*

Obs. This species has doubtless been introduced into South Africa by European ships.

Mus Colonus, Licht. Hair moderately long and very soft; body thick in proportion to its length. Colour above grey tinted with yellowish brown, especially towards the root of the tail; sides and cheeks pale tawny; upper lip, chin, throat, breast, belly, extremities, and space round base of tail, white; nails covered by long white hairs; ears moderate, oval; inner surfaces covered with a fine short reddish white hair; outer surfaces thinly sprinkled with short blackish brown hairs; whiskers moderate, hairs black towards roots, whitish towards tips; point of nose reddish white; tail distinctly ringed, and thinly sprinkled with short hair, brownish above, and dull white beneath. The bases of all the hairs on the body are slate-coloured. Length from nose to base of tail three inches and a half; length of tail two inches and a half.

Inhabits South Africa.—Eastern districts of the Colony.

Obs. I am in doubt whether the species now described be the Mus Colonus or not. Without good figures, or very detailed descriptions, it is quite impossible to discriminate with any degree of certainty, the smaller species, at least, of this genus., The length of the specimen in my possession is inferior to the one described by *Brants*, but that may possibly depend upon the mode in which the skin has been prepared.

Mus Gentilis, Lichtenstein. Hair long and close; ears short; head moderately large, long and sharp; nose projecting; ears round, small, naked, and closely applied to the head; body long and slender; fore-feet very short, hind-feet moderately long with naked soles and small white nails; tail moderate, ringed, nearly naked, and of a blackish colour. Hair long and soft, the whole of the upper parts brown-grey, the under-parts white, and the colours in some (perhaps males) are separated from each other by a rusty tint; feet whitish. Length from nose to base of tail three inches and a half; length of tail two inches and a half.

Inhabits Egypt and Nubia.

Brants, *Het Geslacht der Muizen, p.* 126.

Mus Cahirinus, Geoffroy. (Cairo Rat.) Above dark blue-grey or grey-brown, lighter on the sides; beneath, dirty greyish; hinder part of the back with flat bristles intermixed with the hair, grey towards their bases, reddish brown towards and at the tips; head long and pointed; nose elongated with a moderately strong hairy crest; ears large, oval, and hairy; feet whitish brown; whiskers dark brown; tail greyish brown, marked with scaly rings, and nearly naked. Length from nose to base of tail four inches; length of tail three inches and a half.

Inhabits Egypt,—in houses at Cairo.

Echimys d' Egypte, Geoff. *Mem. de l' Instit. d' Egypte, part Hist. Nat. pl. 5, fig.* 2.

Mus dimidiatus, Cretzschmar. The whole of the upper parts a reddish straw-yellow; the under parts and a spot under and behind each ear, white; teeth yellow; on the head a slight intermixture of black hairs; whiskers mixed black and white; ears dark brown with a slight sprinkling of fine white hairs; hinder part of back and flanks with some bristly hairs which appear flattened near their points; towards bases silvery-grey, towards points red-yellow or grey, seldom white. Tail with scaly rings, and between them some short whitish hairs; upper surface of tail brown, under surface white; feet white; eyes dark brown. Length from nose to base of tail about four inches; tail the same.

Inhabits Nubia and Sinai,—*frequents rocky situations.*

Mus Dolichurus, Smuts. (Long-tailed Mouse.) Hair long and moderately soft; the surface colour of the upper-parts clear rufous brown, freely pencilled with black on the forehead, crown, and centre of back; sides of body inclined to rufous

yellow; under-parts, extremities, and upper-lip, white; upper incisors a dull orange-colour, lower ones yellow; whiskers long, hairs black towards roots, white or nearly colourless towards tips; ears broad and round, both surfaces with a thin sprinkling of very short tawny-white hairs; nails light horn-coloured and covered with white hair. Tail with distinct scaly rings and a thin covering of short rigid hair, which is most abundant towards the point, above brownish black, beneath and on sides dull white. The bases of all the hairs of body a pale slate-colour. Length from nose to base of tail six inches; length of tail six inches and a half.

Inhabits South Africa,—district of Uitenhage.

Mus Verroxii, Smith. (Verreaux's Mouse.) Hair of moderate length and soft. Upper and lateral parts a pale fawn colour with a dull mouse or slaty tint more or less distinctly visible under it; lower parts bluish white; apex of muzzle, upper lip and lower parts of extremities nearly pure white; ears long, oval, and both surfaces thinly covered with short brownish black hair, whiskers long and brownish black; tail reddish brown distinctly annulated, and with a sprinkling of fine very short white hairs, which increase in number and length near the point. Claws commonly concealed by stiff whitish hairs. Length from nose to base of tail five inches and a half; length of tail six inches. The bases of all the hairs in this species are a dull slate colour, and the forehead in some specimens is thinly pencilled with black.

Inhabits South Africa,—near Cape Town.

Mus Natalensis, Smith. (Natal Mouse,) Fur long and moderately soft. The surface colour of the upper and lateral parts of the head and back a pale reddish or yellowish brown, pencilled or freckled with black: the latter variegations are most distinct towards the posterior part of the back, and arise partly from the tips of many of the woolly hairs being of a blackish tint, but principally from the presence of a series of black hairs rather stronger and longer than the fur, being more or less profusely intermixed with it; sides of body and outer surfaces of extremities, towards body, a light tawny or fawn-colour; under-parts of neck, breast, belly, inner sides of extremities, and feet, dull bluish white or white with a faint reddish tint. Tail covered pretty closely with very short, rigid hair, brown above and dull white beneath; ears moderate and ovate; their inner surfaces, particularly towards margins, thinly sprinkled with short tawny hair, their outer surfaces with a few brownish black hairs. Upper incisors a pale orange-colour, lower ones straw-yellow; muzzle slightly elongated. The bases of all the woolly

hair a dark slate-colour. Length from nose to base of tail five or six inches; length of tail about four inches.

Inhabits South Africa,—about Port Natal.

Mus Caffer, Smith. (Caffer Mouse.) Hair long and very soft; head slender. Colour above blue-grey or brown-grey; sides and outer surface of hinder extremities the same, only of a lighter tint; the under parts of neck, breast, and belly, the inner surfaces of hinder extremities, the fore legs, and all the feet, greyish white; tail thinly covered with a very short fine hair, greyish white with a faint tinge of brown; ears rather long and of an oval form, the inner surfaces thinly sprinkled with minute white hairs, and the outer ones with blackish hairs; whiskers long, soft, and of the same colour as the back. Length from nose to base of tail three inches and a half; length of tail three inches.

Inhabits South Africa,—Cafferland.

Mus minutoides, Smith. Hair rather short and rigid. Top of head, upper part of neck, and centre of back, finely pencilled black, brown, and tawny, each hair being annulated with two of those colours near the point, the latter in most of them black; face, sides of head, outer surfaces of extremities towards body, and the sides of the body, rufous yellow or fawn coloured, and here and there finely pencilled with black; upper lip, chin, throat, breast, belly, and inner sides of extremities towards body pure white; lower parts of extremities reddish white; tail brownish, distinctly annulated and thinly sprinkled with fine short whitish hair; whiskers pale brown; ears nearly bare, and the few hairs that do occur on them are very short and of a tawny hue. Length from nose to base of tail three inches; length of tail two inches and a quarter The bases of the hairs on the back and sides are a dark slate colour, those on the under parts are like the tips pure white.

Inhabits South Africa—near Cape Town.

Mus Barbarus, Lin. (Barbary Mouse.) Ground colour fuscous brown above, intermingled with a few yellow hairs, and marked on each side with five or six continuous longitudinal yellowish lines, narrower than the intervening spaces, and blended gradually with the under surface, which is pale, and between the fore legs nearly pure white. Ears moderately large, rounded and covered with so short a fur as to cause them to appear naked. Anterior feet with the outer and inner toes merely rudimentary, so that three only are remarkable, and of these the two inner are the longest; the three middle toes of the hinder feet very long, the inner one rudimentary, and the

outer so short as not to reach the base of the adjoining one. Size intermediate between the domestic mouse and the black rat.—*Bennet, Zool. Journal.*

Inhabits North Africa.

Genus Dendromys. *Smith.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{3}{3}\,\frac{3}{3}$,—16. *Upper-jaw—incisors each with a deep longitudinal groove on its anterior surface; first molar crowned with eight more or less distinct tubercles, second with three or four tubercles and some cutting laminæ, third with two transverse cutting laminæ. Under-jaw—incisors smooth; first molar with six tubercles, second with four, third with cutting laminæ. Nose acute, lip cleft, ears roundish and nearly naked; tail annulated, scaly and thinly covered with hair; fore-feet with three toes and a small wart in place of a thumb; hind-feet with five toes.*

Dendromys typicus, Smith. (Cape Tree Mouse) Hair long and silky; surface colour of upper and lateral parts of head, neck, body, and outer surfaces of extremities brown-red or ferruginous; the lower parts of the latter paler; upper lip, chin, lower parts of neck, breast, belly, and insides of extremities, a tawny or reddish white: from hind-head to base of tail along the middle of the back, a more or less distinct black line; ears broad, roundish, and very thickly sprinkled with short brownish or black hairs; whiskers black, growing paler towards the tips; eyes black. Tail distinctly annulated; above, rather freely covered with short brownish hairs, beneath with whitish ones. Length from nose to base of tail four inches and a half; length of tail five inches.

Inhabits South Africa,—commonly found upon trees.

Obs. In aged specimens the colour is a clear and deep rufous, and the black dorsal line is generally wanting.

Dendromys Melanotis, Smith. (Black-eared Tree Mouse.) Hair rather short and very soft. The upper and lateral parts of the head, the neck, and the body, together with the outer surfaces of extremities, towards the body, bluish grey or mouse-coloured with a faint tint of pale red-brown; on the sides of the body the grey is less distinct and the red is much more evident, but of a lighter and clear hue than on the back; lower parts of cheeks, upper lip, lower parts of neck, breast, belly, and feet, dull white, the latter tinged with light rufous; muzzle greyish white; space in front of each eye dull black; ears rounded and their inner and outer surfaces thinly covered with a fine short black hair; a small white spot immediately

behind the lower edge of each ear; whiskers moderate, hairs black towards their roots, lighter towards their tips. Along the centre of the back, from the shoulder to the tail, a distinct black line; tail scaly and annulated, with a thin covering of short hair which is brownish above and whitish beneath. Length from nose to base of tail three inches; length of tail two inches and a half. The bases of all the hairs are slate-coloured.

Inhabits South Africa,—on shrubs near Port Natal.

Fam. MACROPODA.

Genus Gerbillus. *Desmarest.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\frac{0}{0}$, *molars* $\frac{3}{3}\frac{3}{3}$,—16. *Incisors curved inwards, each of the upper ones with a longitudinal groove in front: first molar of each side of both jaws with three elevated transverse ridges; second and third of upper jaw, and second of lower, with two, and the last of lower with only one. Ears moderate; fore legs short, with four toes; hinder legs long, or very long, with five toes; tail moderate, sub-annulated and thinly covered with hair.*

Gerbillus Afer, Gray. (African Gerbille.) Hair rather long and very soft; the top of the head, the upper and lateral parts of the neck, the back, the sides, the tail, and the outer surfaces of extremities, a pale fawn or isabella colour; the back pencilled with black slightly, the top of the head and back of neck freely, indeed on the latter the black may be said to be in some the prevailing colour. Upper lip, chin, under surface of neck, breast, belly, lower parts of sides, inner surfaces of extremities, and upper surfaces of feet, white; face and sides of muzzle dull white freely pencilled with black; whiskers principally black; claws long and horn-coloured; ears broad and slightly inclined to pointed; outer and inner surfaces with a very thin sprinkling of fine short whitish fur. The hairs which are tipt with fawn or isabella colour, are pale slate-coloured towards their bases, those with white tips are of that colour throughout. Length from nose to base of tail about seven inches; length of tail six inches.

Inhabits South Africa.

Spicilegia Zoologica, p. 10. Meriones Schlegelii, Smuts, *Mamm. Capens. p.* 41. Duin Rat and Nacht-Muis *of the Cape Colonists.*

Obs. The colours assigned by Mr. Gray are darker than they commonly appear, which may be accounted for by his having described specimens that had been transmitted to Europe in spirits.

Gerbillus Auricularis, Smith. (Kamiesberg Gerbille.) Hair long and soft. The surface colour of the upper parts of the head, the neck, and the back, a pale tawny brown faintly and sparingly pencilled or mottled with dull black; sides of neck and body tawny brown of a lighter tint; cheeks white variegated with clear tawny brown; upper lip, chin, lower parts of neck, breast, belly, and feet, pure white; whiskers dull black, the hairs light towards their tips; behind each ear a distinct, pure white blotch; ears small, oval, and flesh-coloured, the inner surfaces margined with some short whitish hairs, elsewhere bare; the outer surfaces thinly sprinkled with some short brownish black hairs. Tail thickly covered with short stiff hair, above brownish, beneath reddish white; toes short, nails small and covered with white hair. Teeth white, the upper incisors longitudinally grooved in front. Length from nose to base of tail four inches and three-quarters; length of tail two inches and three-quarters.

Inhabits South Africa,—Mountains of Little Namaqualand.

Gerbillus Namaquensis, Smith. (Namaqualand Gerbille.) Hair very long and soft; upper parts of head, neck, and body, subferruginous or fawn coloured, slightly pencilled with black, more particularly on the posterior part of the back; sides of neck and body the same colour, only lighter and without the black pencilling; upper lip, chin, lower parts of neck, breast, belly, and feet, a bluish white; whiskers moderate, the hairs black towards their bases and whitish or colourless towards their points; ears long and very broad, the insides thinly sprinkled with short white hairs towards their margins, the outsides, generally, with thinly scattered short black hairs. Tail with distinct scaly rings and a very scanty covering of short hair, which is black on the upper surface and reddish white beneath; nails short and covered with reddish white hairs; toes short; hinder extremities shorter in proportion than in the two preceding species. Incisors of the upper jaw smooth and orange-coloured. The hairs on the back and sides towards their roots slate-coloured, on the belly and under-parts entirely white. Length from nose to root of tail five inches and a half; length of tail four inches and three-quarters.

Inhabits South Africa,—Little Namaqualand, where it is known by the name of *Nacht Muis*.

Obs. The molars and upper incisors in this species do not exactly correspond in structure with those of the Gerbillus Afer; the tail approximates it to the true mice, and the shortness of the hind-legs requires it to be viewed at the least as an aberrant species. When the order *Rodentia* shall undergo a thorough revision, and the numerous species be examined and faithfully compared, the present will doubtless be found to have its appropriate position in a different genus.

(*To be continued.*)

SOUTH AFRICAN
QUARTERLY JOURNAL,
SECOND SERIES.

No. 2. JANUARY—MARCH, 1834. Part 3.

A Sketch of the Progress and present State of Geographical Discovery in the African Continent, made from the Colony of the Cape of Good Hope.—By J. C. Chase.

[Continued from page 137.]

In the year 1824, the excellent and zealous Missionary at the Kuruman station, the Rev. Mr. Moffatt, visited at Melita, the capital of the Chief of the Bawanketz tribe, the celebrated and much dreaded Makkabba, whom the commercial jealousy of the surrounding clans had represented as a monster of cruelty, a character which, upon acquaintance, proved to be totally false. It is, to be regretted that the itineraries and observations of this Missionary have not been laid before the public, as from his perfect knowledge of the language, his frequent journies into the interior, and his known shrewdness and ability, he must be in possession of a rich store of information; but there unfortunately appears to be a decided aversion on the part of the various Missionary Societies to publish the knowledge gained by their respective agents, who possess such superior opportunities of acquirement. The avidity, however, with which Ellis's "Polynesian Researches" have been received, it is to be hoped, will induce others of this most devoted and praiseworthy class of men to step forward and gratify public curiosity, which cannot fail to add largely to the list of supporters to the Missionary cause,—the cause of our common faith, which we are enjoined to extend.

In the same year Mr. George Thompson visited Leettakoo and the neighbouring Districts, but the approach of the devastating Mantatees, then on their road to the Batlapees, arrested his progress, and his discoveries were confined chiefly to some new points along the banks of the Gariep.

As far back as the year 1818 an experiment was made by the Colonial Government to open a trading intercourse with the Griquas and Corana tribes, by the establishment of a Fair

at the village of Beaufort, on the borders of the Karroo, but which, from several causes, fell into disuse. In 1825 facilities were therefore afforded to the Colonists to proceed for the same purpose beyond the limits of the Colony to the kraals of the natives, and numerous parties soon took advantage of this permission, several of them opening up new routes, until a wide and intimate knowledge has been gained of the regions to the northward. Of the most important of these I shall now give a rapid sketch, begging at the same time the indulgence of the meeting for this lengthened paper, which has already imperceptibly grown far beyond the limits which I had at first prescribed to myself.

In 1826 Messrs. BAIN and BIDDULPH (the former* having been the first to take advantage of the Government proclamation opening the trade, and who visited the country in 1825), having reached the Chue lake, or Honing Vley, the extreme point of Burchell, where I shall therefore take them up, started thence in a N. E. direction, about 80 miles to the westward of Campbell's route, and succeeded in gaining a town of the Baquina tribe of Bechuanas, called Litabaruba, within about 40 miles of the Tropic of Capricorn, and in about long. 26. 30., penetrating a country from the before named lake, the great haunt of wild animals, and of the stately Giraffe, covered with a lofty but scattered bush, supplied with small springs, where numerous Bechuana outposts were established, they crossed the river Moloppo (discovered by Campbell) in about lat. 25. 40, and long. 24. 50, 120 miles below the point where he passed that stream. From this they proceeded to a river supplied by scanty springs, called the Loorolani, lat. 25. 15 and long. 25. 25, through a tract abounding with game, especially the white Rhinoceros, an animal almost unknown to Naturalists From this point they proceeded to Siloqualalie, in about lat 25, and long. 26. 10, the new capital of the Bawanketz, Melita, its former city, having been destroyed, and its sovereign, Makkabba, killed by the Mantatees, as already related. Between the Loorolani river and town of Siloqualalie, a distance of 50 miles, were fine open plains, diversified by low conical hills, the soil a deep red sand, the springs weak, and situated in a calcareous soil. At Siloqualalie the traders were well received by Sibigho, the successor of Makkabba, who invited them to assist him in dislodging a party of Mantatees, who had intrenched themselves at Litabaruba, a principal town of the next tribe, that of the Baquina, which had been overrun and dispersed by their invaders. The small number of the trading

* With Mr. B. KIFF, who is to accompany the New Expedition as Superintendent of its Trading Department.

party, and the conduct of the Bawanketz, forced their consent, and they proceeded along with a large body of native warriors on a most interesting journey, which afforded full scope to observe their method of waging war, and their mode of supplying their commissariat, to the last mentioned place 50 miles in advance, where they drove out the marauders, who were panic struck at the sound of guns. The country passed to this place is very woody, water plentiful, but no running streams were seen; it is apparently very elevated, and doubtless forms a part of the separating ridge, or central plateau dividing the eastern and western waters. On the east, at a trifling distance, a range of lotfy mountains, stretches in a diagonal from N. W. to S. E., named by the natives Le Roopa and was reported to be very rich in iron and copper, this divides the Baquin and Bawanketz from the Bamorutzi nations; the range may be represented on the map as commencing in lat. 23. 40, and long. 26. 30, and proceeding to lat. 24. 50, and long. 27. 20, their farther extent being unknown. A somewhat lower ridge rises on the western side and the river, upon the head of which Litabaruba is situated, flows towards the north-east. The language, manners, and habits of the people are the same as the other Bechuanas.

The next journey of importance in these regions was that of Messrs. Scoon and M'Luckie, in 1829, of whose Expedition an outline has already appeared in the fourth number of this Journal. This trading party leaving the Missionary station at Bootschnap, situated on the Hart river, near the confines of the country seized from the natives by the mixed race or Griquas, and now denominated by *courtesy*, Griqualand, in about lat. 27. 50, and long. 25. 5, commenced a route in the same direction as that of Mr. Campbell, in 1820, frequently intersecting it, and verifying many of the points laid down by that individual. In about lat. 24. 50, and long. 27. 40, somewhere below the Philip's Fountain of Campbell, the party took a direct easterly route, and after proceeding about 40 miles, discovered a large river, called by the natives Moriqua: at the ford or drift they crossed, it was very deep, and 40 yards wide. This stream, which they traced nearly up to its source, and for 50 miles down towards its estuary, rises in the south between the 25th and 26th degree of latitude, and 29th and 30th longitude, first takes a N. W. course to the ford just mentioned, and then sweeps to the N. E., and passes through a large opening in an elevated range of mountains, running nearly due W. and E. under the Tropic. The natives stated their ignorance of the country beyond these mountains, but they understood that it was inhabited by men with long hair, robbers by profession, and

of the most ferocious disposition. The banks of the river are well timbered, but infested with alligators of a large size. From the ford the traders drove on eastward, along and close to a range of mountains on their right hand or south, rich in metallic ores, where were abundant remains of Bichuana villages, (the natives having been destroyed by the Mantatees,) and the traces of recently wrought iron mines. The country was most fertile in appearance, luxuriant in pasturage, well wooded, and watered by frequent streams rising in the mountains, and joining it was imagined the *Morigua*, which not unlikely falls into the Indian Ocean, on the coast of Inhamban. Geographical accuracy is not to be expected from mere traders, but this party having been conducted by an educated individual of great good sense and capability of observation much faith may be placed upon his journal, written with great care and precision of detail. Somewhere about lat. 24. 50, and long. 29. 40, they crossed another considerable river running direct north, called the *Waritcie*, and they then turned immediately to the southward over a large plain, on which, just within the eastern verge of the horizon, could be seen two or three peaks of far distant mountains. At the extreme point of this journey, which may be placed somewhere about lat. 26. 30, and long. 30. 5, they fell in with a Zoola Chief, named Matsellikats, or Omsediggas, who had established himself there, having been driven over the great coastwise ridge of mountains by Chaka, the late sovereign of Natal, and who was imitating the example of his victor, by reducing in his turn to his despotic sway those inoffensive and half-civilized tribes, upon whose territories he had been forced. *Kurrechane*,* or properly *Chuan*, the town of Baboons, so named by the natives from the number of those animals in the mountains surrounding that place, has been frequently visited by these traders; it was, however, in ruins, having been overrun by the Mantatees, in their road towards the Colony, in 1824. The inhabitants had removed 20 miles from the original site to the N. W., and their new city, under the same appellation, contained only 2000 instead of 16,000 souls, as in the time of Campbell. The neighbouring country is described as very mountainous, highly beautiful, and exceedingly fertile.

After the unexpected discovery made by these traders of a Zulo Chieftain (Omseddigas) on the northward of the elevated mountain range, which skirts the eastern coast, Mr. Moffat, the Missionary, proceeded from Kuruman to the new kraal of this interloper by almost a direct easterly course, by taking of which he was the first to trace up one of the main branches of the Gariep, or Orange-river, to its source, that marked in the

* First visited by Mr. Campbell in 1819.

maps as the Zwarte Bushmans-river. Having gradually ascended to this point, he found himself on a considerable ridge, from which the slope was rapid and abrupt, and descending this elevated region (a continuation of the hills seen by Scoon and M'Luckie on their right hand, when they turned south, towards the kraal of Omsediggas), he proceeded to the village of the Zulo Chief, situated near a deep and rapid stream, called by him the Elephants'-river, which is situated nearly in lat. 26. 30, and long. 30. 20. It is probable that this stream runs into Delagoa Bay, or some of the rivers which empty themselves there.

The memoranda made by Messrs. Hume and Millan, whose observations, already laid before this Society, render it certain that they had entered the tropical regions, not having yet come to hand, I am unable to give even an outline of their journey, in which they state they had discovered two fine rivers.

In looking over the latest maps of the southern peninsula, a wide extent of country, it will be seen, is laid down along the western coast, to the north of the Orange-river, or Gariep, which is occupied by the Namacqua and Damara tribes; of this however but little is satisfactorily known, and it is represented by the few travellers who have visited it as very sandy, arid, and barren, and but slightly populated; a large stream here figures on the chart, formerly called the Fish-river, but since the Borradaile, which intersects, or rather drains the country, watering it most probably only in the rainy season. It falls into the Gariep, at a small distance from its mouth.

Before closing this part of the abstract of our information regarding the countries to the north, and proceeding to the discoveries made along the eastern coast, it may not be altogether uninteresting to describe the progress made upon the western shores of the peninsula, towards the Portuguese Settlement of Benguela, and which we are enabled to do from the report of the survey of Captain Chapman, of H. M. sloop *Espiegle*, prosecuted by the orders of Commodore Nourse, in 1824.

The singular anomaly on the charts of this part of the African continent must be familiar to every reader. I mean that a line of coast should be protracted, on which the sweeping remark is placed, "No fresh water from Fish Bay to St. Helena Bay," that is for a distance of above 1,000 miles; while at the same time within these two positions the sites of several native villages are laid down. Upon what sort of beverage their inhabitants depend, the sagacious map framers have not at the same time condescended to inform us, whether from the dews of heaven, from distilled sea-water, or, whether from some peculiar physical constitution, they needed not liquid food; they must, however, be a singular race of men, probably akin to those

other monsters, imagined to be the denizens of "Africa, always offering something new," "whose heads do grow beneath their shoulders." The probability of this record has long been suspected, and from the great currents observed by numerous navigators, which set out from the shores, the existence of rivers of no small magnitude has been supposed. Captain Chapman in some measure verified these suspicions, by discovering 13 miles to the north of Augra Ilheos, or Walvisch Bay, in lat. 25. 53, a fine river named by him the Somerset, with good water, sufficient for the supply of shipping, and in lat. 17. 10; another, which he called the Nourse, with a copious discharge, over the bar of which he brought the ship's pinnace laden with water, and drawing four feet. The appearance of natives and wild animals observed by this Expedition at various parts of the coast is proof sufficient of the existence of this necessary fluid. The following positions were either visited or discovered by this survey:—

Elizabeth Bay, in lat. 27.

Angra Pequena, in lat. 26. 40, where one of B. Diaz's columns, dated 1486, was found entire.

Spencer Bay, lat. 25. 47, a spacious inlet, and well sheltered.

Walvisch Bay, lat. 22. 53.

Somerset-river.

Nourse-river, in lat. 17. 10.

Fish Bay, spacious good soundings, deep water; perfectly safe from all winds and swell.

Port Alexander, lat. 15. 50, good anchorage, deep water, perfectly safe from winds and sea, at its north cape called Cape Negro, another pillar of Diaz was found.

Little Fish Bay, long. 15. 8, extensive; a fine river falls into it.

Bottomless Pit, long. 13. 15, a remarkable inlet; no sounding but at its head, and then in 45 fathoms.

St. Mary's Bay, lat. 13. 27, well sheltered; a Portuguese pillar.

Elephant's Bay, lal. 13. 13, plenty of water.

Victoria-river, lat. 14. 15, a fine river; fresh water close to the bar; natives seen, but who did not speak the language of Benguela, although within a trivial distance from that place.

PART III.—*Eastern Interior.*

The progress of discovery, and the manner in which it had been conducted beyond the Colony, along the Eastern Coast, from the discovery of the Cape, up to the year 1808, has already been touched upon in the first part of this notice; but previous to describing the countries since opened by the enter-

prize of the Colonists, or their necessities, I shall resume that part of the subject, and for the sake of perspecuity, even at the risk of the charge of employing "*vain repetitions*," collect, in one point of view in this place, the history of all that has been effected from the earliest period up to our own times upon the Eastern line of march.

As far back as the year 1683, a party of wrecked sailors are reported to have reached the Cape from Port Natal, an extraordinary occurrence if we take into account the distance from the Colony, at that time not extending far beyond the present Cape District, and the interval populated by aggravated, hostile and unknown tribes.

The Caffers were accidentally discovered by a party of Boers on a hunting expedition in 1684; and, four years later, the inhabitants of Natal were visited by the celebrated Captain Woodes Rogers, whose name is immortally blended with that delightful and dangerously seductive, half fact and half romantic tale, which "hath made many" sailors,—"The History of Robinson Crusoe," whose prototype, Alexander Selkirk, Rogers had rescued at the Island of Juan Fernandez, from an unknown grave, and a solitude of which the genius of Defoe has almost made an envied Paradise; Who amongst us, calling back the recollections of our boyish days, cannot remember wishing to be the hero, or even the humble *Friday*, of that exquisite story?

In 1719, Captain GERBRANTTZ VAN DER SCHELLING is said, upon the authority of the generally accurate Kolben, to have reached the Cape over land from Delagoa Bay, where he had lost his ship, and in 1727 a Lieut. Monas is recorded to have visited Natal from the last named Settlement.

Lieut. PATTERSON, the friend of the discoverer of the Orange River, Colonel Gordon, in 1779, made the Colonists acquainted with the country occupied by the advanced posts of the Caffers, then rapidly encroaching on the Hottentot nations, who, pressed upon from the east by those invaders, and on the west by the whites, were destined soon after to relinquish their existence as an independent community.

In 1783 a few sailors from the memorable wreck of the East India vessel, the Grosvenor, effected their escape from near the Omsemcaaba river, above 1000 miles by land from Cape Town, and in consequence of their representations, the sources of the Kei river were explored during the same year, by a party sent out to rescue the remainder of the survivors from that tremendous catastrophe.

In 1790 the Colonist, WILLIAM VAN REENEN, a man of undaunted spirit, great curiosity, and determined courage, whose frequent travels into the Interior, and discoveries, have never

been duly appreciated, or were adequately rewarded, by his philanthropic expedition in this year in search of the survivors of the wrecked crew and passengers of the ship just named, added in extent more largely than any preceding traveller to our knowledge of the countries to the eastward; and his interesting journal, published by Captain Riou in 1792, gave a tolerably correct, although slight, insight into the geography of regions already traversed, but hitherto undescribed; his journey extended as far as the scene of the wreck, 300 miles beyond the then Colonial boundary.

Benjamin Stout, Captain of the American ship the "Hercules, who lost his vessel near the river Beka in 1795, pretended to give a description of the country through which himself, passengers, and crew safely proceeded to the Cape, the valueless nature of which has already been remarked; and in 1797 Mr. Barrow visited the Keisikamma river, from its source to the mouth, and furnished some very interesting information of the Amakosa nation, with whom he passed some time.

In 1801, the residence of that extraordinary man, Dr. Van der Kemp, in Caffraria, gave him an excellent opportunity of observing the manners of its inhabitants, and for acquiring geographical information, of which, to some extent, he availed himself; and Professor Lichtenstein, two years later, contributed considerable and valuable stores to our previous knowledge of this part of the globe.

The internal quarrels of the Caffers, and their aggressions upon the Colonists of the Border, which had began to assume a very serious aspect as far back as the year 1798, forced the Colonial Government, in 1811, to resort to the determined and vigorous measure of driving the intruding part of the savage population, which had fixed itself eastward of the Great Fish river, across that long-acknowledged boundary, from which time up to 1819, a continual scene of warfare ensued, and ended only in an invasion from the Colony during the latter year, when the Troops and Burghers penetrated as far as the Kei river, and a pretty accurate idea of the country, and of its capabilities, as far as that stream, were then formed by a survey made at the instance of the Government.

(*To be continued.*)

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 160.

Genus Pedetes. *Illiger.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{4}{4}\,\frac{4}{4}$,—20. *Lower incisors cut obliquely, and not pointed; cheek teeth formed of two elliptical parts, united at their internal extremity and separated above by a deep furrow; head short, large, and flat; muzzle obtuse, terminated by small nostrils at right angles; ears long, narrow, and pointed; eyes large; whiskers large; anterior feet with five toes and long, narrow, curved nails, channelled beneath; posterior feet with four toes, the external very small, the intermediate of the other three much the largest, the rest equal, all furnished with straight, broad, triangular nails; tail long and villose.*

Pedetes typicus (Cape Pedetes.) Hair moderately long and rather rigid. Colour of upper and lateral parts of head, neck, back, sides, and outer surface of extremities towards body, tawny or a pale fawn colour, in the male distinctly sprinkled or pencilled with black; upper lip, angles of mouth, lower jaw, under surface of neck, inner surfaces of anterior extremities, feet, breast, belly, inner sides of hinder extremities, and a vertical stripe on each flank, pure white; cheeks more or less varied with white; inner surfaces of ears naked, except towards tips where there is a thin coating of fine white down; outer surfaces towards bases covered with long hair of the same colour as that of the back, the remainder flesh-coloured with a thin sprinkling of short brownish hair, the margins fringed with white hair. The entire of the first third of tail and the upper surface of the second third the colour of the back, the sides and lower part of the latter portion white, the last third black and tufted; claws of fore-feet blackish, those of hind-feet light horn-coloured. Length from nose to base of tail twenty-two inches; length of tail about nineteen inches.

Inhabits South Africa.—Eastern districts of the Colony.

Yerbua Capensis, Sparm. and R. Forster. Mus Caffer, Pallas, *Glires.* Depus Caffer, Thunb. *in Mem. de l'Acad. de Petersb. tom* iii. *p.* 309. Gmel. Helamys Capensis, F. Cuvier, *in Dict. de Sc. Nat. tom* xx. *p.* 344. Spring-Haas *or* Spring Hare *of the Cape Colonists.*

Fam. CUNICULARIDÆ.

Genus Bathyergus. *Illiger.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}$ $\frac{0}{0}$, *molars* $\frac{4}{4}$ $\frac{4}{4}$,—20. *Incisors projecting in front of the lips, upper ones plain or each with a longitudinal groove in front; molars without true roots, indented on the edges; body thick and cylindrical; head thick; muzzle truncated; eyes very small; no external ears; legs short; soles of feet and toes margined with rigid hairs; toes five, armed with nails fitted for digging; tail short, depressed, and margined with long stiff hairs.*

Bathyergus maritimus, Illiger. (Cape Sand Mole.) Fur short and silky; colour of the upper parts of head and body, blue-grey with a rusty tint, which is generally most distinct upon the top of the head and back of the neck; lower parts dull grey, in some specimens with a faint rufous tinge: hair of the tail reddish white; the rigid hairs margining the sides of feet and toes white; whiskers light grey-white; eyes black; point of nose flesh-coloured; cutting-teeth pure white, those of the upper-jaw each with a broad, deep, longitudinal furrow. Ear openings oval and with a bare flesh-coloured margin. Length from nose to root of tail about fourteen inches; length of tail an inch and a half. When the fur is reversed it is found to be slate-coloured, except towards the surface.

Inhabits South Africa,—the sand flats near Cape Town.

Mus maritimus, Gmel. Mus suillus, Schreb. Arctomys maritimus, Thunb. *in Mem. de l' Acad. de Petersburg, tom* iii. *p.* 308. Grande taupe du Cap, Buff. *Suppl.* Sand Mole *of the Cape Colonists.*

Bathyergus Capensis, Desm. (Cape Spotted Mole.) Fur rather long and very soft; the surface colour of the upper and lateral parts light rusty brown or dark grey, on the upper and lateral parts of the head passing into dull black; lower parts of sides and belly reddish white; muzzle, upper lip, spaces round angles of mouth, lower lip, chin, circumferences of eyes and ear openings, together with a portion of the top of the head, pure white; rigid hairs of tail, side of feet, and toes white; claws horn-coloured; cutting-teeth white, and plain in front. Beneath the surface the fur is dark slate-coloured, excepting where the pure white marks occur, in which situations it is white throughout. Length from nose to base of tail about eight inches; length of tail three quarters of an inch.

Inhabits South Africa.

Mus Capensis Pallas, Gmel. Bodd. Taupe du Cap de Bonne Esp. Buff. Georychus Capensis, Illiger. Bathyergus Capensis, Desm. *Mam. No.* 520. Blesmol *of the Cape Colonists.*

Bathyergus caecutiens, Lichtenstein. (Blind Land Mole.) Fur short and silky, surface colour of the upper and lateral parts of head and body rusty brown or rusty grey, in some lights, with a splendid greenish gloss; under-part greyish white with a faint rusty tint; rigid hairs of tail reddish white, those of sides of feet white; nails light horn-coloured; eyes extremely small; incisors pure white, and all plain in front. The entire of the fur, except towards the surface, light blackish green, palest on the sides and under-parts of the body. Length from nose to base of tail about five inches and a half; length of tail half an inch.

Inhabits South Africa,—rare near Cape Town,—common in gardens in the District of Uitenhage.

Bathyergus Hottentotus, *Less. et Garn. Bullet. de Science Nat.* viii. *p.* 77. 80. Bathyergus Ludwigii, (*young,*) Smith, *Zoological Journal, vol.* iv. *p.* 439.

Obs. In all the species of this genus, not only the intensity of the tints is subject to considerable variety, but even the colours themselves differ slightly in different individuals. Specimens of *Bathyergus maritimus* are often found with the entire of the surface colour a light bluish grey, and others, with the upper parts at least, very deeply tinted with a dull rufous or rusty hue. Examples of *Bathyergus Capensis* are occasionally found with the upper and lateral parts of the head of the same colour as the back; others with those parts very deep black; and some are met with where the colour of the upper parts of the body is a light bluish grey or rusty grey instead of a rusty brown. The *Bathyergus caecutiens* has not unfrequently the upper and lateral parts of the body of a pale rusty grey,—and in young specimens the entire is a moderately dark slate-colour.

With incomplete clavicles or none.

Genus Hystrix. *Linnæus.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{4}{4}\,\frac{4}{4}$,—20. *Molars with flat crowns, but with ridges of enamel; head strong; muzzle gibbous; ears short and rounded, tongue with spiny scales; fore-feet with four toes and a rudimentary thumb, hind-feet with five toes; spines more or less long on the body.*

Histrix cristata, Linnæus. (Crested Porcupine.) Forehead and muzzle covered with dusky brown bristles; top of head and back of neck with a mane of long spinous bristles, reddish white towards points, elsewhere brown black; anterior part of back and upper parts of sides with stiff spines annulated black and white; middle and hinder part of back with short white spines; lower-parts and extremities with short flexible black spines or bristles. Tail armed with strong spines annulated black and white, and at its point furnished with a tuft of hollow membraneous cylinders, each of which is attached by a long narrow

peduncle. Eyes black; ears thinly covered on both surfaces with short, black, coarse hair. Length from nose to base of tail about three feet; length of spines of tail about nine inches: some of the spines on back measure about sixteen inches.

Inhabits Africa and Asia,—common in South Africa.

Le Porc-epic, Buff. Eister Vark *of the Cape Colonists.*

Genus Lepus. *Linnæus.*

Incisors $\frac{4}{2}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *cheek teeth* $\frac{6}{5}\,\frac{6}{5}$,—28. *Upper incisors in pairs, two in front and two immediately behind them; the former large and cuniform, each with a longitudinal furrow on its anterior surface, the latter small; the lower incisors square; cheek teeth with small flat crowns with transverse laminæ of enamel; ears and eyes large; fore-legs short with five toes; the hind-legs longer with four toes covered with hair; tail short; teats from six to ten; cæcum very large.*

Lepus Capensis, Linnæus. (Cape Hare.) Hair moderately long and slightly rigid; the surface colour of the forehead, crown of head, back, and upper portions of sides, pale tawny or tawny white freely brindled or speckled with black; sides of body and outer surfaces of extremities towards body dull greyish white or pale rufous-white finely pencilled with dusky; lower-parts of legs pale rufous more or less pencilled with dusky; muzzle tawny sprinkled with black; sides of head variegated tawny, dull white, and black; eyes brown, and surrounded by a circle of white hairs with a more or less distinct whitish stripe extending backwards from the outer angle of each in the direction of the ears; nape pale tawny or rufous; upper-lip, angles of mouth, and lower-parts of neck, tawny or greyish tawny, the latter sometimes pencilled with dusky white; chin, breast, belly, and inner-surfaces of extremities, a pale fawn-colour or a light rufous-white; ears with a thin sprinkling of tawny-white down on the inner-surfaces; outer-surfaces towards inner-margins and tips thickly covered with short hair entirely black on the latter and variegated brown and dull white elsewhere; inner margins till near the points fringed with long tawny hair, outer margins with short pure white hair, tips margined with short black hair; soles of feet clothed with coarse rufous-brown hair; tail black above, pure white beneath and on the sides. Length from nose to base of tail about seventeen inches; length of tail about four inches.

Inhabits South Africa.

Vlakte Haas *of the Cape Colonists.*

Obs. A variety of this species is very common in South Africa, in which the lower parts are pure white, and the outer surfaces of legs pencilled dusky and dull white. The colours of the other parts are also subject to slight variations.

Lepus Ægyptius, Geoff. (Egyptian Hare.) Fur reddish brown; breast and feet a red fawn-colour; tail black above, white below; ears longer than the head, black at the tips. Length fifteen inches.

Inhabits Egypt.

Obs. Some Naturalists consider this as identical with the last species, but as I have no opportunity of comparing specimens from both localities I leave it to be decided by those who possess the necessary means.

Lepus saxatilis, F. Cuvier. Hair moderately soft. Forehead, crown, back, and upper portions of sides, finely variegated, black, reddish white, and ferruginous, the latter colour sometimes nearly wanting; muzzle and sides of head bluish white, freely pencilled with black; nape and more or less of sides of neck dull rufous; lower parts of neck, anterior part of breast, lower parts of sides, and outer-surfaces of extremities towards body, greyish white freely pencilled with black, lower parts of extremities dull white pencilled or tinted with brown; chin, hinder part of breast, belly, and inner-surfaces of extremities, white; ears with a thin sprinkling of fine short tawny white hair on their inner-surfaces, on their outer-surfaces towards inner-margins and tips thickly covered with short hair which is variegated black and white in the former situation, and entirely black in the latter, the rest of the outer-surfaces with a thin sprinkling of short tawny or whitish hair; the edges margined with white hair till near the points, where it is black or black and white; in most specimens there is a small white spot on the forehead. Tail white with a black stripe along its upper surface which terminates a little way from the point; soles of the feet clothed with long coarse reddish brown hair; eyes hazel-brown. The bases of the hairs inclined to white. Length from nose to base of tail twenty-four inches; length of tail six inches: length of ears about six inches and a quarter.

Inhabits South Africa,—mountainous situations.

F. Cuvier, *Dict. des Sc. Nat.* xxvi. *p.* 309. Geoffroy, *Dict. Class.* ix. *p.* 382. Rheebok Haas *and* Kol Haas *of the Cape Colonists.*

Lepus nigricollis, F. Cuvier. Top of head sprinkled with yellow; sides red; chin grey; throat white; a greyish white band from the muzzle to the ears; upper part and sides of neck and shoulders bright black. Size of a rabbit.

Inhabits Mauritius, Java, and India.

Lepus isabellinus, Cretzschmar, (Isabella-coloured Hare.) Above a dark isabella-colour, variegated on the head and back by an intermixture of a few black hairs; the neck and throat of a lighter tint; chin, belly, inner surfaces of extremities and

a transverse band which in its course encircles each eye white; tail longer in proportion to the body than in the European hare, white with a black-brown stripe on its upper surface. Ears about one-fourth longer than the head, inner and outer surfaces naked, the edges margined with isabella-coloured hair; whiskers black towards base, white towards tips; feet of the same colour as the body; soles clothed with rough reddish hairs, nails black and pointed; eyes bright brown. Length from nose to base of tail sixteen inches, length of tail nearly three inches.

Inhabits sandy flats south-west of Ambukol,—*Ruppell.*

Lepus Cuniculus, Linnæus. (Common Rabbit.) Fur rather short and soft; the surface colour of the top of head, and of the back, tawny or pale reddish brown, freely pencilled with black; sides and outer-surfaces of extremities towards body silvery grey, slightly pencilled with black; eyes surrounded by a circle of white hairs; forehead, muzzle, sides of head, and lower parts of neck, pale rufous yellow; back of neck deep rufous; chin, breast, belly, and inner-surfaces of extremities white; fore-legs, towards feet, pale rufous brown; hinder legs, towards feet, dull white with pale rufous tints; soles of feet clothed with coarse rufous yellow hair. Tail white with a black stripe along its upper surface. Length from nose to base of tail about seventeen inches; length of tail two inches and a half; length of ears three inches and a quarter.

Inhabits South Africa,—Robben and Dassen Islands.

Le Lapin, Buff. Rabbit, Pennants, *Quadrup.* ii, *p.* 103.

Obs. It is generally understood that the Rabbit was introduced into South Africa from Europe. The colours vary considerably in different specimens.

Lepus rupestris, Smith. (Rock Hare.) Hair rather coarse and of moderate length: centre of muzzle, forehead, and top of head, reddish brown finely pencilled with black; back of neck pale rufous-brown, many of the hairs tipt with dull white; back and upper-parts of sides reddish-brown and black, intimately mixed in nearly equal proportions, each hair being annulated with those colours; lower parts of sides, and under-parts of neck, breast, and extremities towards body, rufous with many of the hairs tipt with obscure white; upper and lower lips white; chin and belly pale rufous-white; sides of head dusky pencilled with reddish white; ears short, inner-surfaces thinly sprinkled with a fine pale tawny down, outer surfaces towards tips and inner margins thickly covered with a fine short hair variegated brownish black and dusky white; eyes brown; whiskers black, some of the hairs tipt with reddish white; lower parts of extremities and base of tail deep rufous; tip of

tail black and bushy. Length from nose to base of tail sixteen inches; length of tail two inches and a half: length of ears three inches and a quarter.

Inhabits South Africa,—rocky situations.

Obs. The colours in this species vary considerably, but in all specimens the extremities and base of tail are always dark rufous, and the tip of the latter black or brown-black. The hind-legs are much shorter than in the *true hares*, and its manners connect it closely with the rabbit.

Order EDENTATA.

No incisors in either jaw, canines in some but not in all; some Genera with only cheek teeth, others without any teeth; toes varying in number and armed with strong nails; orbits and temporal fossæ united.

Genus Orycteropus. *Geoffroy.*

Incisors $\frac{0}{0}$, *canines* $\frac{0}{0}$, *molars* $\frac{7}{7}$—26. *Molars separate, without roots or distinct crowns, formed of bony substance, traversed longitudinally by parallel tubes; head elongated; toes four on the fore-feet and five on the hind-ones; the hind-feet plantigrade; nails very thick and strong.*

Orycteropus Capensis, Desm. (Cape Ant-eater.) Hair short, coarse, and scanty upon the body in old individuals, plentiful in young ones: head yellowish brown; body dull brown or rufous brown; extremities black or black-brown, the hair longer than on the body; upper-surface of tail at root the same colour as back, under-surface and elsewhere yellowish white; outer-surfaces of ears towards bases, and inner edges, thinly covered with short, white or tawny hair; eyes dark brown; nails light horn-coloured. Length from nose to base of tail four feet eight inches; length of tail about two feet; length of ears seven inches.

Inhabits South Africa.

Myrmecophaga Capensis, Thunb. *in Mem. de l' Acad. de Petersb.* iii. *p.* 301. Aard Vark *of the Cape Colonists.*

Genus Manis. *Linnæus.*

Toothless, body elongated, and, together with the tail, covered with hard corneous imbricated scales or plates; muzzle long; tongue protractile; eyes small; feet with five toes; nails of the anterior ones long, and formed for digging. Animal possessing the power of rolling itself into a spherical shape.

Manis longicaudata, Geoff. (Long-tailed Manis.) Body, legs, and tail covered with large pointed striated scales; the

throat and belly covered with hair; nose slender, head smooth, legs short; tail tapered. The colour of the whole animal chocolate. Length from nose to tip of tail fourteen inches; length of tail about forty inches.

Inhabits Central Africa.

Manis tetradactyla, Lin. *Syst.* 33. Schreb. ii. 23. *tab.* lxx. Le Phatagin, Buff. x. 119, *tab.* xxxiv. Manis Africana, Desm. *Mamm.*

Manis Temminckii, (Temminck's Manis.) Head short, extremity of muzzle without scales; eyes small; body and tail broad, somewhat depressed and arched above; scales large, their points rounded or semilunar; their outer surface finely striated, longitudinally, and of a dull green-colour tinted with brown, except towards the points, where each is more or less completely margined with yellowish white or pale fawn colour. Tail obtuse at the point, with five distinct rows of scales towards its base, and four towards its extremity; nails pale horn-coloured or yellowish, the three middle ones of fore-feet much the longest. Length from nose to base of tail about seventeen inches; length of tail eighteen inches.

Inhabits Southern Africa,—eastward of Latakoo.

Obs. Never having had an opportunity of examining a perfect specimen of this animal I am unable to state what are the appearances of the under-parts of the body, or how many rows of scales exist on the back.

Order PACHYDERMATA.

Two or three kinds of teeth; four extremities with the toes variable in number and furnished with strong nails or hoofs; no clavicles; organs of digestion not formed for ruminating.

Fam. PROBOSCIDEA.

Genus Elephas. *Linnæus.*

Incisors or tusks $\frac{2}{0}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{2}{2}\,\frac{2}{2}$,—10. *Tusks slightly arched towards their extremities, composed of ivory-incased with a crust of enamel; molars composed of vertical and transverse laminæ covered by enamel; five toes on all the feet; nose elongated into a cylindrical proboscis, with a moveable appendage at its termination, serving the purpose of a finger; head large; neck short; eyes small, lateral; ears extremely flat and very large; body large and massive; tail short, tufted at the end; mammæ two.*

Elephas Africanus, Cuvier. (African Elephant.) Skin rough and nearly destitute of hair; head round; forehead convex; ears much larger than in the Asiatic Elephant, and descending

as far as the legs; cheek-teeth marked by lozenge-shaped lines of enamel. Length from nose to root of tail about sixteen feet; common height from twelve to thirteen feet at the shoulder, rather less behind.

Inhabits Africa,—common in the Interior of South Africa.

Elephas Capensis, Cuvier. *Mem de l' Instit.*

Obs. M. F. Cuvier has established a new genus, to receive this species, under the name Loxodonta. *Histoire Naturelle des Mammiferes, avec des Figures originales; dessines d'apres des Animaux Vivans; &c.* Par M. M. Geoffroy Saint-Hillaire et F. Cuvier, Levraisons 52de et 53eme.

Fam. PACHYDERMATA *proper.*

Genus Hippopotamus. *Linnæus.*

Incisors $\frac{4}{4}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{7}{7}\frac{7}{7}$,—40. *Upper incisors thick, short, conical, and bent inwards; lower ones cylindrical, directed obliquely forward, the intermediate ones strongest; canines greatly developed, forming strong tusks, curved upwards; the three or four first cheek-teeth conical and simple; the rest irregular, and with flat crowns edged with elevated ridges of enamel; head thick and square; muzzle very large; eyes and ears small; body thick and heavy; legs short, terminated with four toes; tail short; mammæ two, ventral; skin almost without hair.*

Hippopotamus amphibius, Linnæus. (Sea Cow.) With the exception of a few scattered bristly hairs upon the lips, forehead, crown of head, edges of ears, and extremity of tail, this animal is entirely without covering. Skin rough and hard; the head, sides, and under-parts of neck, breast, and groins, a dull pink red; belly obscure white tinted with red or reddish white; the rest of body and extremities dusky or greyish black; eyes chocolate brown with a lightish ring round the pupil. Length from ten to eleven feet; height from four to five feet.

Inhabits the rivers of Africa.

Obs. Desmaret makes two species of this genus, founded upon the characters of skulls of specimens from different parts of Africa. The one he calls *H. Capensis*, the other *H. Senegalensis.*

Genus Sus. *Linnæus.*

Incisors $\frac{4}{8}$ *or* $\frac{6}{8}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{7}{7}\frac{7}{7}$,—42 *or* 44. *The lower incisors directed obliquely forwards, the upper ones conical; canines projecting out of the mouth, the upper ones frequently bent upwards; molars tuberculous; four toes on all the feet, the two middle ones only touching the ground, armed with strong hoofs; nose elongated, cartilaginous: mammæ twelve. Body covered with a thick skin furnished with a bristly hair.*

Sus Larvatus, F. Cuvier. Bristles long, particularly upon the upper parts of the neck and back. Head yellow-white, the forehead more or less pencilled with black; neck and body black, variegated with white, from most of the bristles being of that colour towards the points; extremities almost entirely black; eyes dark brown; canines very strong, those of upper-jaw projecting horizontally beyond the lips, those of lower jaw upwards; between upper canines and eyes a distinct tuberculous elevation covered with hair; ears short and thinly covered, both without and within, with coarse black hair, which is longest at their tips; tail thinly covered with black bristles. Length from nose to root of tail between four and five feet; length of tail about one foot.

Inhabits South Africa and Madagascar.

Sus Africanus, Schreb. *Saugth. Tab.* 327. Thunb. *in Mem. de l' Acad. de Petersb.* iii. *p.* 320. Daniel, *African Scenery, Tab.* 22. Bosch Vark *of the Cape Colonists.*

Obs. Scarcely any two specimens of this species exhibit the same colours, some are a brownish black variegated with white, and others are almost entirely of a light reddish brown or rufous tint without the white markings: indeed such are the varieties that it is scarcely possible to say what are the most prevailing colours.

Genus Phascochærus. *F. Cuvier.*

Incisors $\frac{2}{6}$, *canines* $\frac{1}{1}\,\frac{1}{1}$, *molars* $\frac{5}{4}\,\frac{5}{4}$,—30. *The two intermediate lower incisors smaller than the rest, and apart from each other; canines very large and directed upwards; molars composed of cylinders of enamel inclosing the osseous substance; head very large; muzzle very broad; a large fleshy lobe under each eye and a warty excrescence on each side of the muzzle between the eye and the tusks; eyes small; figure nearly that of the Hog.*

Phascochærus typicus. (African Boar.) The top of the head, the upper part of the neck and the anterior part of the back, covered with very long and rigid bristles of a black-brown colour, those on the top of the head diverging like the rays of a circle. On the other parts the hair is shorter of a dull brown, slightly inclined to white on the flanks and belly. Tail furnished at the top with a number of blackish brown bristles, elsewhere nearly naked. Length from nose to root of tail about five feet; length of tail about eleven inches.

Inhabits Africa,—interior of the Cape Colony,—rather rare.

Aper Æthiopicus, Pallas, *Misc. p.* 16. *tab.* 2. and *Spic. Zool.* ii. *p.* 3. *tab.* 1. Sus Æthiopicus, Gm. Sanglier du Cap Vert or Sanglier d' Afrique, Buffon. Phascochærus Africanus, Desm. Vlacke Vark *of the Colonists.*

Genus Rhinoceros. *Linnæus.*

Incisors $\frac{0}{0}$ *or* $\frac{2}{2}$ *or* $\frac{4}{4}$, *canines* $\frac{0}{0}$ $\frac{0}{0}$, *molars* $\frac{7}{7}$ $\frac{7}{7}$ *or* $\frac{6}{6}$ $\frac{6}{6}$,—32 *or* 36. *Incisors unequal amongst themselves where they exist; anterior molars small, posterior increasing progressively; eyes small, lateral; one or two horns placed upon the muzzle; three toes on all the feet; tail short, laterally compressed near the end; mammæ two, skin very thick, naked, and rugous.*

Rhinoceros Africanus, Desm. (African Rhinoceros.) Skin rough and knotty but without plaits and folds; colour ashy or ashy brown; a few dark bristly hairs on the edges of the ears and about the bases of the horns; also some stiff hairs on the sides of the tail towards its tip. Upper lip sublongated and pointed; no cutting-teeth in either jaw; two horns on the muzzle, the one behind the other, the foremost much the longest, sometimes measuring two feet in length; skin rough and knotty but without plaits or folds. Length from twelve to fourteen feet; height from seven to eight feet.

Inhabits South Africa.

Rhinoceros bicornis, Linnæus. Rhinoceros Africanus, Cuvier. Rhinaster *of the Cape Colonists.*

Rhinoceros simus, Burchell. Horns two, muzzle truncated, skin without folds; larger than last described species.

Inhabits Southern Africa,—northward and eastward of Latakoo.

Rh. du Burchell, Desm. *Mamm. p.* 401.

Genus Hyrax. *Hormann.*

Incisors $\frac{2}{4}$, *canines* $\frac{1}{0}$ $\frac{1}{0}$, *molars* $\frac{6}{6}$ $\frac{6}{6}$,—32. *Anterior cheek-teeth in the upper-jaw with flat-triangular crowns, the others with the crowns slightly concave; the posterior molars of lower-jaw with a transverse ridge dividing the middle of the crown; body with two kinds of hair, one short woolly and abundant, the other long, bristly and very scanty; fore-feet with four toes, hind-ones with three; nails small, flat, and scarcely covering the upper part of toes; head rather large, nostrils oblique; upper-lip cleft; ears small and rounded; no tail; two pectoral and four ventral mammæ.*

Hyrax Syriacus, Gmel. (Syrian Hyrax.) Colours of the upper-parts grey mixed with reddish brown; the under-parts pure white; whiskers and eyebrows long and bristly; on the body similar bristles are thinly scattered amongst the fur; ears rounded and both surfaces covered with hair: hind-feet with only three toes, the middle one the longest. Length from nose to hinder extremity of body seventeen inches.

Inhabits Abysinnia, Arabia, and Syria.—*Bruce.*

Agnus filiorum Israel, Prosp. Alp. *Ægypt*, i. 232. Daman Israel, Buff. *Supp.* Ashnoko, Bruce, *Travels* v. 139. Hyrax Syriacus, Schreb. *tab.* ccxi. B.

Hyrax Capensis, Schreber. (Cape Hyrax.) Hair moderately long and soft; the surface colour of the upper and lateral parts of the head and neck, of the back, sides, and outer surfaces of extremities, dusky black or brownish black, very freely pencilled with pale tawny, indeed the two colours may be said to be nearly in equal proportions. The mottled appearance arises from most of the hairs being annulated with tawny near their points. Chin, lower parts of neck, breast, belly, and inner-sides of extremities, tawny, yellow-white or dull white, the sides of the former pencilled with black. The bases of the hairs of the upper and lateral parts blackish brown, those of the under parts like the tips. Ears rounded, inner surfaces covered with short whitish hair, outer surfaces with blackish hair; whiskers and eyebrows long, black, and bristly; on each cheek and under lower-jaw, a tuft of similar hairs, and on the neck, body, and outer sides of extremities, others of a like description, are thinly interspersed amongst the general covering and project greatly beyond it. Eyes black. Length from nose to hinder extremity of body eighteen inches; height at shoulder about six inches.

Inhabits South Africa,—rocky situations.

Hyrax Capensis, Pallas, *Miscell. p.* 34. *Tab.* iii. *Specil.* ii. *p.* 22. *Tab.* ii. Daman Cuvier, *Descrip. Osteol. et Comparat. in Ann. du Mus.* iii. *p.* 171. *Tab.* xix. xx. Klip Das *of the Cape Colonists.*

Obs. Some Naturalists consider this and the *Hyrax Syriacus* as identical.

Hyrax arboreus, Smith. Hair rather long and soft; colour above tawny red, freely mottled or pencilled with black; lower parts of the sides reddish white with less of the black pencilling; upper and lower lips, chin, and under parts of body, and inner surfaces of extremities, dull white; on the crown of the head, black is the predominating colour; the sides and centre of the muzzle covered with short dusky or reddish white hair; eyebrows white; whiskers long and black; ears short, rounded, and projecting but little beyond the fur; outer surfaces covered with long dusky white hairs, inner surfaces, scantily, with hair of the same tint; on the centre of back, about half-way between head and vent, a narrow longitudinal white blotch, and beneath, about the middle of the lower-jaw, a transverse black stripe; feet and toes covered with a dirty reddish white hair. The two centre incisors of lower jaw with tricuspid points. A number of strong black hairs, much longer than the general covering, are scattered on the back and sides, and assist in producing the variegated surface colour; the bases of the short

hairs are bluish black. Length from nose to vent twenty-one inches; height at shoulder about seven inches.

Inhabits South Africa,—forests in the eastern parts of the Colony and beyond it;—*rare.*

Translations of the Linnean Society, vol. xv. *p.* 468.

Fam. SOLIDUNGULA.

Genus Equus. *Linnæus.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\,\frac{1}{1}$, *molars* $\frac{6}{6}\,\frac{6}{6}$,—40. *Eyes large; ears pointed, erect, and moveable; feet terminating in a solid hoof; tail with long hair or tufted towards its extremity; two inguinal mammæ; a bare spot on the inner side of each fore-leg, a little above the knee, or on all the four legs.*

Equus Zebra, Linnæus. (The Zebra.) Hair short and white, with close narrowish black bands on the body, neck, and legs, and brown ones on the face; nose bay; dorsal line indistinct from the others; belly and insides of thighs without bands. Tail blackish; mane erect, full, bushy, and banded with white; ears white at the tips, and each with two transverse black bands. Length from nose to base of tail nearly seven feet; length of tail about fifteen inches; height at shoulder about four feet.

Inhabits Africa,—mountainous parts of the Cape of Good Hope,—Guinea, "Congo and Abysinia, *Ludolf.*"

Equus Zebra, Lin. Equus Montanus, Burchell, *Travels*, i. 139. Zebra, Ray, *Quad.* Zebra, Buff. *Hist. Nat.*. Wilde Paard *of the Cape Colonists.*

Equus Quagga, Pennant. (The Quagga.) Hair short; head, neck, mane, and shoulders, blackish brown, banded with white; on the back and sides the gound colour is paler and the bands are more diffused; rump greyish; dorsal line black, margined on each side with a white line; belly, tail, and legs white; ears each with two irregular black bands and a white tip. About the length of *Burchell's Zebra*, but of a more robust form.

Inhabits South Africa,—plains in the Interior.

Le Cougga, Cuv. *Reg. Anim.* 245. Quacha. Penn. *Quad.* 14. Kwagga or Couagga, Buff. *Suppl.* Quagga *of the Cape Colonists.*

Equus Burchelli. (Burchell's Zebra.) Hair short; ground colour white; head with numerous narrow brown stripes; nose bay-coloured; the neck and body with alternate transverse stripes of black and brown, the former broad, the latter nar-

row, and nearly fill up the spaces between the black ones. Dorsal line narrow before but gradually widens towards the tail, and is distinctly margined on each side with white. The belly, legs, and tail quite white; the mane alternately banded black and white. Rather smaller than the Zebra.

Inhabits South Africa,—plains towards Latakoo.

Equus Zebra, *Male*, F. Cuv. *Menag. Mus.* Equus Zebra, Burchell, *Travels*, i. 139.

Order RUMINANTIA.*

Teeth of three sorts; incisors in the lower-jaw only, usually eight in number, opposed to a callosity in the upper jaw; canines in some species in the upper-jaw, in others, in both, in most none; cheek-teeth or molars almost always six on each side, in both jaws; articulation of the jaw disposed for a grinding motion; no clavicles; extremities disposed for walking; the toes externally, two anterior, rudimentally in most, two posterior, all unguiculated, excepting the posterior of some. Single metacarpal and metatarsal bones to each foot; organs of digestion disposed for chewing the cud; four stomachs; intestines long; mammæ two or four, always inguinal; horny or osseous horns in the males, and often the females of most species. Food invariably vegetable.

Tribe CAMELIDÆ.

No horns; no succentorial hoofs; no muzzle; nostrils slit; upper-lip divided, separately moveable, and extensible; horny soles to the feet; toes covered with crooked unguicular claws or nails; canines in both sexes; neck long; limbs long; lower abdomen drawn up under the pelvis, retromingent.

Genus Camelus. *Linnæus.*

Incisors $\frac{2}{0}$, *canines* $\frac{1}{1}$, *false molars* $\frac{1}{1}$, *Molars* $\frac{3}{3}$,—36. *Inferior incisors in trenchant quoins, the superior lateral and cuneiform; canines conical, straight, robust; false molars on each side, separated from the other teeth; in the diastema, and uncinated; head long; chaffron convex; no sinus under the eyes; nostrils slit obliquely, and closing at pleasure; eyes prominent; ears small; pores at the back of the head, feet with toes only free, the rest united; neck bent; one or two hunches on the back much developed; callosities on the sternum, and flexures of the extremities; tail reaching to the tarsus; mammæ four; hair*

* The descriptions &c. of the animals of *this Order*, with but few exceptions, have been copied almost *verbatim* from the excellent Monograph of Col. Hamilton Smith, contained in Griffith's Translation of the Animal Kingdom, vol. v.

woolly; the ventriculus with membraneous cells, one of which is very large to contain water; male organs slender, reversed in a state of repose; scaphoid and cuboid bones of the tarsus separated; stature very large.

Camelus Dromedarius, Linnæus. (Dromedary.) Head small; back with a single hunch; ears short; neck long, slender, and bending; hair soft, longest about the neck, throat, and hunch; colour on the latter dusky; on the other parts a reddish ash tint. Tail long, the hair on the middle soft, on the sides long, coarse, and black. Length from nose to base of tail about seven feet six inches; length of tail about sixteen inches; height about four feet eight inches.

Inhabits Northern Africa and Asia.

Camelus Arabicus, Pliny, *lib.* viii. *c.* 18. Camelus Dromas, Gesner, *Quad.* 159. Le Dromedaire, Buff. Forskal, iv. *No.* 12.

Tribe CERVIDÆ.

No horns, or deciduous horns; feet truly bisulcated; structure elegant, slender, mostly with muzzle, suborbital sinus, and with canines in the upper-jaws of the males; succentorial hoofs.

Genus Cervus. *Linnæus.*

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}\,\frac{0}{0}$ *or* $\frac{1}{0}\,\frac{1}{0}$, *molars* $\frac{6}{6}\,\frac{6}{6}$,—32, *or* 34. *The canines in some males compressed and bent back; head long, terminated in most by a muzzle; ears large; pupils elongated; suborbital sinus in most; tongue soft; no gall bladders; four inguinal mammæ. Horns solid, deciduous; existing in the males only, in the females with one exception none, palmated, branched or simple; the horn consisting in a burr, or rose-shaped foot, a beam and branches, or antlers; succentorial hoofs in all.*

Sub-genus Elaphus.—*Horns round; three antlers turned to the front; summit terminating in a fork or in snags from a common centre; suborbital sinus; canines in the males; a muzzle.*

Cervus Elaphus. (The Stag.) Horns with three anterior antlers, all curving upwards; the summit forming a crown of snags from a common centre; tail middle-sized; lachrymary sinus; muzzle; canines in the males; colour red-brown in summer, brown-grey in winter; pale disk on buttocks.

Var. Barbary and Corsican Stag. Browner, smaller, lower; horns terminating in forks? This is the Bukr-al washi, and the female Fortass, or Broad Scalp, because without horns, *of the Moors.*

Inhabits Europe, Western Asia, Barbary, Corsica.

Elaphos, Arist. Ælian. Cervus, Pliny. Cerf, Buff. G. and F. Cuvier. C. Elaphus, Auctor. Stag, Pent, Shaw. Hirsch *of the Germans.* Olen, and Jelen, Sclavon. Buga *of Tartar.*

Tribe GIRAFFIDÆ.

Frontal processes prolonged in the shape of horns, covered with hairy skin, which is continued from the scalp, and terminated by long hard bristles, in both sexes.

Genus Camelopardalis. *Linnæus.*

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}$, *molars* $\frac{6}{6}$,—32. *Head long prolonged with tuberculum on the chaffron; osseous peduncles covered with skin, and hairy, terminated by a tuft of bristles; no muzzle; upper-lip entire; no lachrymary sinus; ears long; tongue rough; eyes large, soft, pupil elongated; neck very long; withers much elevated; back oblique; legs slender; no succentorial hoofs: callosity on the breast; tail to the hough; female four teats.*

Camelopardis Giraffa. (The Giraffe.) In stature the tallest of mammiferous animals; coat of a dirty white, marked with dark brown, or ferruginous spots or blotches, somewhat tending to symmetrical forms; large and angular in their shapes; short mane on neck and withers, in alternate parts of black and white; tail terminated by a tuft of dark and long hair.

Inhabits Central Africa,—from Caffraria, and the borders of the Gariep, across the deserts to Abyssinia.

Camelopardalis, Pliny, Oppian. Heliodorus, Gesner. Anabula, Seraph. Alb the Great; Gyraffa, quam Zurnapa, Græci et Latini Camelopardalus nominant, Bellon. Prosp. Albin. Camelopardalus, Lin. Girafra, Camelus Indicus, Johnst. Giraffa Camelopardalis, Briss. Camelopardalis Giraffa, Auctor. Giraffe, Buff. Giraffa, Shaw. Zuraphate. Arabic. Seraphah, Persian. Jirataka Lin Amharic. Zomer, Hebrew. Deba, Chaldaic, Æthiopic. Nabis, Pliny. Naip *of the Hottentots.* Impatoo, *Bushmen.*

Tribe CAPRIDÆ.

Horns persistent, vaginating upon an osseous nucleus, totally or nearly solid; the horny sheath received its increase by annual ringlets at the base, which form in most species annuli, wrinkles, or knots; many striated longitudinally; the horns often

compressed; angular, or sub-angular; animals in general of a light structure, calculated for springing or for swiftness; ears erect, funnel-shaped; pupils oblong; no canines in the mouth; vertebræ of the tail never descending below the hough; stature very various.

Genus Antilope.*

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{6}{6}\,\frac{6}{6}$,—32. *Horns common to both sexes, or in the males only; bony core solid, without sinus or pores, round, or compressed, generally standing beneath the frontal crest, variously inflected, mostly distinguished by annuli, with longitudinal striæ between them; sometimes pearled and forked; the chaffron rather straight, with a muzzle, half muzzle, or simple nostrils; lachrymary sinus in most, and in some a suborbital pouch; eyes large, dark; ears in general long, pointed; inguinal pores; a gall-bladder.*

Sub-genus Aigocerus.—*Horns very large, common to both sexes, pointed, simply bent back, annulated, placed above the orbits. Half muzzle; no suborbital sinus; no inguinal pores; tail descending to the houghs; mane reversed; a white mark before the eyes; throat and under-jaw somewhat bearded; mammæ two; stature large; shoulders higher than the croup.*

Aigocerus Leucophæa. (Blue Antelope.) Four feet high at the shoulder; horns slightly compressed, scimitar-shaped, about twenty-eight inches long, closely annulated, with twenty to thirty rings; no striæ; ears long; colour silvery blue-grey; spot before the eyes, belly and inside of the limbs, white; short white mane turning towards the head; hide black; tail tufted at the end; appearance of beard on the under-jaw.

Inhabits South Africa,—rare.

Antilope Leucophæa, Auctor. Tzeiran, Buffon. Blaauw Bok *of the Cape Colonists.*

Aigocerus Equina. (Roan Antelope.) Four feet four inches at the shoulder; horns very robust, about twenty-four inches long, strongly bent back, with seventeen to twenty-seven prominent rings, more remote from the orbits; ears nine inches long; hair coarse, undulating, loose, mixed red and white; beneath the throat longer, whiter; white spot round and before the eye, formed of a pencil of long hairs; neck with a short white reversed mane.

Inhabits South Africa,—on the elevated ridge near the sources of the Gariep, &c.

Antilope Equina. Antilope Ozanne, Geoff. Cuv. A. Aurita, Burchell.

* When the numerous animals which are included in this genus shall have been more correctly studied in their natural *habitats*, the classification which is at present in use, will doubtless require to be materially altered.

Aigocerus grandicornis. (Long-horned Antelope.) Horns three feet and a half long, fifteen inches in circumference at base, curved like a scimitar, compressed, rounded behind, carinated, rough, with oblique wrinkles on the inner surface, furrows on the external.

Inhabits Central Africa? Bornou?

Antilope Grandicornis, Herman. Empalanga? Empabunga? Empalunga? Purchas. De Bry, *Reg. Congo, p.* 22. Korooko *of the Bornouese*? El Bucher el Achmer *of the Arabs? Denham and Clapperton's Travels.*

Aigocerus barbata. (The Takhaitze.) In size equal to the Equina, with a broad dark nose; white streak before the eye; horns scimitar-shaped, more erect and with fewer annuli; a considerable beard on the chin, and long flowing dark-coloured mane on the neck; colours blue-grey or rufous; no tuft to the tail.

Inhabits the parting ridge of the waters on the south-east coast of Africa.

Takhaitze of Somerville and Daniell.

Obs. It has been surmised that, *The Takhaitze* was no other than the Roan Antelope, and this probability was increased by Mr. Burchell searching in vain for it, where it was said to exist, and finding in its stead the *Equina* already described.

Aigocerus ellipsiprymnus, Ogilby. Hair coarse or bristly, on the upper parts moderately long, on the sides and lower parts rather longer, that of the upper parts of the neck and anterior part of the back reversed and directed forwards. Face dark brown, sides of head variegated dull white and brown; lips and chin whitish, eyebrows and space in front of inner canthi pure white; horns somewhat scimitar-shaped, curved forward and outward, the first third slightly compressed, the other two thirds nearly cylindrical, the last six inches smooth, the rest marked by strong irregular annuli; ears fulvous without, whitish within, and margined with dark brown hair; upper parts of neck, back, and upper portions of sides dark dusky brown; lower portions of sides, throat, breast, and anterior part of belly, greyish white, pencilled with dusky brown; hinder part of belly and anterior parts of thighs nearly pure white; anterior part of throat crossed by a broad white band, and the anterior portion of the lower jaw by a narrow white stripe; the hinder portion of back, about six inches before root of tail, marked by a transverse white stripe which is lost on each side upon the posterior and inner parts of the thigh; extremities dark blackish brown; hoofs black; tail tufted, under surface near root white, the rest blackish brown. Length from

horns to base of tail seven feet four inches; length of tail fifteen inches; length of head about fourteen inches; length of horns following the curve thirty inches; length of ears six inches and a half; height at the shoulder three feet ten inches.

Inhabits Southern Africa,—about Latakoo.

Obs. Having never had an opportunity of examining a perfect specimen of this animal, I have classed it provisionally in the Sub-genus *Aigocerus*. The description above given has been drawn up from an imperfect skin in the collection of Mr. VERREAUX. Mr. STEADMAN has the merit of having first brought this Antilope under the notice of the Scientific world, and it forms one of the interesting objects in his Collection which is at present gratifying the Admirers of Nature in London, and rewarding him for his activity and enterprize.

Sub-genus ORYX.—*Horns common to both sexes; horizontal, very long, slender, without ridges, pointed, black, with annuli somewhat spirally twisted to half or two-thirds of their length; the animals large, with long ears, small or no suborbital sinus, ovine muzzle, darker coloured streak through the eyes, mane on the neck reversed; tail reaching to the houghs, and terminated by a tuft of long hairs; no tufts on the knees, nor inguinal pores? two mammæ. Stature large; general colours of the fur rufous or vinous grey upon a white ground.*

Oryx Capensis. (South African Oryx.) Adult male three feet eight or three feet ten inches high, six feet six inches in length; horns three feet long, annulated, with twenty-eight to thirty-three rings, straight or very slightly bent, horizontal, diverging, and sharp at the points; eyes high in the head; black space round the base of the horns, descending in a streak down the forehead; another passing through the eyes, to the corner of the mouth, connected by a third which runs round the head over the nose. The rest of the head and ears white. General colour vinous buff; the breast, belly, and extremities white; a black list from the nape of the neck to the root of the tail; a broad bar of the same across the elbow, passing along the flank, and ending in a wide space on the thigh above the houghs. Black spot upon each leg beneath the joints.

Inhabits South Africa.

Oryx, Auctor. Passan, Buffon Resc. Sonnini. Gems-bok *of the Cape Colonists.*

Oryx Tao, H. Smith. (Nubian Oryx.) May be a variety of the *O. Leucoryx*. Near four feet at the shoulders; seven feet in length; horns three feet four inches long, more robust, very spirally annulated, equally curved backwards; nose blunt; the neck longer, the structure more elegant; hoofs low and flat; colour rufous and white, forming a grey on the nose,

temples, cheeks, neck, upper arm and lower part of the thigh; more white over the shoulders, back, flanks, and croup; a slight blackish mark above and beneath the eye, and a broad white streak passing before it to the corner of the mouth; mane and tuft of tail white.

Inhabits Nubia, interior of North Africa.

Tao *of the Hebrews and Egyptians.* Dante and Lout *of Congo?* *Leo Afric. de Bry.*

Oryx Besoastica. (The Algazel.) This is perhaps another variety. Three feet five inches high at the shoulder; five feet two inches long; horns three feet long, round, slender, bent back, with thirty-six annuli not spiral; forehead narrow; head long; neck short; body clumsy; legs slender; lachrymary sinus beneath the eye; reversed ridge of short white hair on the neck; head white; dark spot at the root of the horns passing down the face, another less distinct through the eyes; body and neck fulvous-grey.

Inhabits the interior of Senegal.

A. Algasel, Fred. Cuvier, A. Besoartria, Licht. Pallas. A. Elcotragus, Schreber? Lichtenst?

Oryx Addax, H. Smith. (The Addax.) Three feet seven inches high at the shoulders; three feet eight inches at the croup; horns robust, black, round, divergent, with two and a half spiral turns, thirty-two to thirty-five annuli; some dichotomous, extending three-fourths of the length; two feet four inches long; no lachrymary sinus; eyes large, dark: dark-coloured mane on the neck; tuft of long dark hair on the throat; head thick; forehead flat, covered with dark hairs, and surrounded by a narrow white line passing downwards before the eyes; nose ovine; chaffron, cheeks, and neck, liver coloured grey, diluting on the shoulders, and the rest of the body milk-white; hoofs flat, broad, round, and black; tail and tuft white; female two mammæ; horns equally large. This species passes from the Orygine Sub-genus to the Damaline sub-genus Strepsiceros.

Inhabits Nubia.

Strepsiceros and Addax of Pliny and Caius in Gesner. A. Addax, Grætzmer. El Bucher Abiad, of Denham and Clapperton.

Sub-genus GAZELLA.—*Horns common to both sexes, placed nearer the orbits, more vertical, bending back, and the points forward, and also turned outwards, and again inwards, constituting a lyrate form; they are black, annulated and striated. These animals have small lachrymary sinus, inguinal pores, ovine nose; mostly tufts on the knees, and dark-coloured bands*

on the flanks; eyes very large and dark; tail short and tufted; mammæ two or four. Gregarious on open plains.

Gazella Pygarga. (White-faced Antelope.) Adult male three feet eight inches at shoulder; six feet long; horns, twelve to fifteen inches long, seven inches in circumference at base, black, very strong, with ten or twelve semi-annuli on their anterior side, and striated between. A patch of rufous hair at base of the horns, divided by a white streak, which passes down the face to the nose; ears long, reddish outside, sides of the head, neck, flanks and croup, deep purple-brown, the back hoary, bluish white, as if glazed; legs white, no tufts on knees.

Inhabits South Africa.

Antelope Pygarga, Auctor. Nunni *of the Booshwanas.* A. Dorcas, Pallas. A. Pygarga, Ejusd. A. Pourpree, Desmarets, &c. Bonte-bok *and* Bles-bok *of the Cape Colonists.*

Gazella Mytilopes, H. Smith. (Broad-hoofed Antelope.) The male unknown; the female two feet eight inches high; four feet two inches long; head nine inches; horns one foot, slender, round, sublyrate, black, with thirteen or fourteen obsolete rings, standing on a broad rufous spot; ears six inches long; no lachrymary sinus perceptible; incipient dark muzzle between the nostrils; space between the eyes, mouth, under-jaw, breast, belly, croup and legs, white; a bar across the nose, neck, shoulders and flanks; lower part of buttocks, fulvous-ochre colour; a space on the withers and back, of a glazed whitish grey, as in the former; small callosities below the knees, and a dark brown spot at the spurious hoofs; hoofs broad, flat, rounded, black, mussel-shaped; body rather heavy; four mammæ.

Inhabits Western Africa.

A. Naso Maculata, Blainv. A. Nez-tache. A. Mytilopes, Nob. *MS.*

Gazella Dama. (Swift Antelope.) Adult male three feet high at the shoulder, extremely light and elegant in structure; head broad; nose ovine, small; horns black, one foot long, with twelve to sixteen annuli, lyrate, points turned forward and inwards; small lachrymary sinus; ears six inches long; tail short; knees covered by two rows of bristly hairs, turned flat upon the joint, the points inwards; the head white, with a spot of bright rufous hair at the base of each horn; ears six inches long, outside at the root rufous, in the middle white, and tips black; the neck, shoulders, and back, whitish rufous; a spot on the throat, the rest of the body, breast, limbs, and tail, white, with a rufous streak upon each of the fore-shanks. The female nearly equal in size to the male; colours similar.

Inhabits the interior of North Africa from Nubia to Senegal.

L. Nanguer, Buffon. A. Dama, Auctor. Swift Antelope, Pennant, is the young animal. A. Ruficollis, Grætzmer, the adult. Engry? *of the Bornouese.* Ngria? *of the Byhermese.*

Gazella Mhorr, Bennet. Form light and elegant; the head tapers uniformly, with face moderately prolonged, suborbital sinus of small extent; horns black, embedded at their base in long hair, and marked with eight distinct well defined rings, and one or two incomplete ones, which occupy about two-thirds of the entire length, the remainder towards the points being perfectly smooth and shining. They rise upwards from the head, and pass backwards and a little outwards to a short distance beyond the termination of the rings, from which point they form a strong curve forwards, and thus bring the upper and smooth part to a right angle with the rest of the horn, and with the line of profile. Colours of cheeks and neck, outer surfaces of extremities and upper parts of body, a deep fulvous or dull bay, which terminates abruptly in the white of the belly; between the ears and behind the horns it is tinged with blackish or iron grey. The grey occurs again in front of the horns, where it is slightly intermingled with rufous, and is continued in a broad stripe down the middle line of the face to the muzzle. On either side this dark middle streak is bounded by a nearly white but somewhat fawn-coloured streak, proceeding from above the eye to the muzzle. From the inner canthus of the eye a deep grey streak, bordering the last, passes to the angle of the mouth; at its upper part, adjoining the small suborbital sinus, it is nearly black. The same black colour occurs in a corresponding spot above and behind the eye. Immediately adjoining the eye, and surrounding the under lid and outer canthus, is a patch of white; and a large patch of white occurs also under the base of the ear, extending backwards, and being separated in front from that of the hinder part of the eye by the intervention of rather pale rufous proceeding from the cheeks to just behind the base of the horns. The hairs of the base and tips of the ears in front, of their edges, and of two longitudinal lines within them, are white. The outside of the ears is fulvous, with a mixture of blackish, which is considerably increased towards the tips, where the colour is near black. The whole of the lower parts of the sides and under surface, with the inner, the hinder, and the anterior surfaces of the limbs, are pure white. The white of the hinder part of the posterior limbs extends upwards for about four inches above the tail, including the tail and the whole rump, and is prolonged forwards on each haunch in a broad streak about five inches in length. The long hairs of the tip of the tail are

alone fulvous, intermingled with black. The lips and lower jaw, extending to the upper part of the throat, are white. A remarkable white patch is seated about half way down in front of the neck; its form is that of a crescent placed transversely. Length from nose to base of tail four feet two inches; length of tail, exclusive of hair, seven inches: height at the shoulder two feet six inches; height at the loins two feet eight inches.

Inhabits Morocco.

Gazella Euchore. (Springer Antelope.) The adult male about twenty-two inches high at the shoulders, twenty-four inches at the croup; head resembling a lamb's; horns brown-black, lyrate, robust, with about twenty complete rings, tips turned inwards or forwards; general colour of the fur pale-dun, with white about the head, limbs, belly, and croup, separated from the dun by a broad band along the flanks, another on the edges of the fold of the croup, and a dark streak through the eye; females similar to the males; horns more slender, with few distant annuli.

Inhabits plains of South Africa.

Antilope Euchore, Forst. et Auctor. Pronkbok, Vosmaer. A. Marsupialis, Zieumer. A. Pygarga, Blumenb. A. Dorsata, Lacepéde. Spring-bok *of the Cape Colonists.* Tsebe *of the Caffers.*

Gazella Dorcas. (The Barbary Antelope.) Adult male less than the Roebuck; horns black, round, lyrated, thirteen inches long, annulated at base, semi-annulated in the middle, with twelve or thirteen bars, points slightly turned forwards, and the sides striated; facial line concave; face rufous, with black in the middle, and edged at the side with yellowish-white, which extends from the orbits to the nostrils; a white and black streak from the eyes to the nose inside; ears streaked with black; eyes large and black; general colour pale fulvous; below white; tail short, tufted with black; brushes on the knees; a broad brown band on the flanks; female with horns more slender, points turned inwards; two mammæ.

Inhabits Northern Africa, Southern Syria, and Persia.

Dorcas, Ælian. A. Dorcas, Pallas et Auctor. Gazal *of the Arabs.* Tzebi *of Scripture.* Gazalle, Buffon.

Var? *Gazella Kevella.* (The Kevel.) Adult male equal in size to the former; facial line straighter; horns more robust, compressed at base, longer, with more decided flexures, with twelve to twenty annuli, points turned forwards; orbits larger; eyes fuller, hazel colour; white space round the eyes, broader, and the same colour extending on the nether jaw; streak down the face fulvous; below each eye fulvous-brown, without blackish intermixture; general colour pale fulvous, beneath

white, and on the buttocks separated by a faint streak of brown; the brown band on the flanks sometimes obliterated; tufts on knees; female resembling the former, and in a younger state, often mistaken for the Corinna.

Inhabits South-western Morocco, North Africa, between the Chain of Atlas and the Sahara.

Antilope Kevella, Auctor. Le Kevel, Buffon.

Var? *Gazella Corinna.* (The Corinna.) Adult male somewhat less than the Kevel; horns black, more depressed at base, recumbent, and simply lyrate, slightly turmescent, about seven inches long, closely wrinkled beneath with obsolete small bars in the middle; nose and mouth white; chaffron and streak before the eyes bright fulvous; forehead and general colour pale-fawn, mixed with grey on the flanks; beneath white; a light chesnut band on the flanks; small dark tufts on the knees.

Inhabits Central Africa.

Antilope Corinna, Auctor. Corine? Buff. Korin *of the Negroes.*

Gazella Soemmerringii, Cretzschmar. The upper parts of the neck and body, the cheeks, the middle of the under part of the neck, and the outer surfaces of the extremities, a dull isabella colour; the throat, breast, belly, and inner sides of extremities, a glittering snow-white; the line of union of the two colours distinctly defined; a narrow longitudinal white stripe on the outer surface of each fore-leg, between the knee and the foot; hinder parts of buttocks and space immediately in front of tail white, the hair closely set, velvety, and lying in different directions. Along the centre of the forehead and face a broad sooty-black band, and a narrow one of the same colour crosses each eye and extends downwards to the nose; on the forehead the hair is formed into a curled tuft; beneath the eyes and bases of ears a white blotch; the outer surfaces of ears is an isabella colour, margined towards points with blackish hair, the inner surfaces with longitudinal stripes of white hair. Horns strong, nearly round, and each annulated with sixteen distinctly elevated rings, tips smooth, the first portions of the horns on the same parallel with the head, then they incline backward, and towards the tips they assume a direction inwards and upwards; tail white above with a few black hairs at the point, beneath bare and black; lachrymary sinus about an inch below the eye, and situated in the black band already mentioned. Length from nose to base of tail four feet six inches; length of tail nine inches; height at shoulder two feet seven inches; height at rump two feet eight inches and a half.

Inhabits Abyssinia.

(*To be continued.*)

SOUTH AFRICAN
QUARTERLY JOURNAL,
SECOND SERIES.

No. 3. APRIL—JUNE, 1834. **Part 1.**

A Sketch of the Progress and present State of Geographical Discovery in the African Continent, made from the Colony of the Cape of Good Hope.—By J. C. CHASE.

[Continued from page 168.]

A fresh, and by far the most important, impulse was now given to discovery in this quarter, by the Settlement of the British Immigrants in 1820, in the District of Albany, upon the immediate borders of Caffraria, whose continued failures for several years, in their agricultural pursuits, drove them into a trading intercourse with their barbarous neighbours. The policy of the Dutch government, which was persevered in by their successors the British, from their conquest of the colony up to this period, was to prevent all connection between the Colonists and Caffers, and *death* was the penalty held out in terrorem for passing over the proclaimed boundary, or being detected in trafficking. The urgent calls of an imperious necessity, the fear of actual starvation on the one side, and the promise of a lucrative trade on the other, however, broke through the absurd and impolitic restraint, and an extensive but illicit commerce was soon established. After several ineffectual attempts on the part of the Colonial Government to maintain their antiquated system, they were obliged in 1824 finally to give way, first authorizing a Fair at one of their border forts on the Keisikamma, and subsequently, in 1830, allowing the Traders to wander as they listed through the Caffer country, by which permission the whole territory from the Eastern Frontier to Delagoa Bay has now been traversed and described, and a number of traders have settled themselves in the Caffer country as permanent residents, whose example must lead to the civilization of the natives. This trade, at first despised, has already brought into the British Settlement above £200,000, and its annual value (which has progressed from year to year) is now stated as worth £34,000 sterling.

In May 1824, a party under Lieutenant Farewell subsequently joined by Lieut. King, both officers of the Royal Navy, settled themselves at Port Natal, for the purpose of trade, and although that enterprise has not realised the expectations with which its originators set out, chiefly owing to a want of subordination and concert in the persons composing it (precautions of the first importance to be attended to in a savage country by a company of adventurers, distantly removed from and destitute of the support of a recognised government,) it has still been of great service in extending the opportunity of our inquiries into the state of the surrounding territory.

Major Dundas, of the Royal Artillery, and Civil Commissioner of the Albany District, with a party of colonial youth, sons of the British Settlers, volunteers for the occasion, were dispatched in 1828 to reconnoitre the advance of the forces of the Zulo Chief CHAKA, then supposed to be advancing upon the Colony with the intent to subdue and exterminate all the intervening nations. This party penetrated nearly as far as the Omzimvooboo, or St. John's river, having in their return fallen in with and beaten a party of marauders, mistaken for the van of the Zuloes; and in the same year, Colonel Somerset, the active and most efficient commandant of the Frontier, than whom no person is so well fitted, by a knowledge of its localities and of the habits of the barbarians, for that important post, with a considerable body of troops, proceeded to the sources of the Omtata river, the scene of Major Dundas' late affair, from which he dislodged the residue of that very formidable predatory band, since ascertained to have been that of MATUANA, a chief driven out from the eastward by CHAKA, and following up the system of conquest and robbery which the oppressor had so successfully taught him to pursue. The routes taken up by these two separate expeditions, the first near the coast, and the latter far inland, and both above 250 miles from the Colony, have added much to our local information of the interior.

The unfortunate travellers, Messrs. COWIE and GREEN, the particulars of whose journey has already appeared in the 5th number of your Journal, visited the Portuguese Settlements of Delagoa Bay overland, from the Colony in 1829, and two years previously that well-known individual John Cane, formerly a mariner, had penetrated to the same position from Natal, being sent there by orders of the Zulo King, Chaka; the notes and geographical sketches of the former, with the information derived from this latter person, *viva voce*, have given an opportunity to fill up a map, and to give some description of the people inhabiting the regions thus visited.

These numerous expeditions, to which may be added the itineraries of the many colonial traders, who have now traversed

almost every part of Cafferland, even 120 miles beyond Port Natal, to the kraal of Dingaan, the present Chieftain of the Zulo people, with that of Dr. Smith, who, accompanied by Lieut. Edie, of the 98th Regiment, made a scientific journey to Natal in 1832,—have afforded us a tolerably well defined knowledge of the outlines of the geography of this portion of the African Continent.

Having thus gone through an account of the progress of discovery along the shores of the south-eastern coast, I proceed to give an outline of their Geography, and at the same time some idea of their respective population; but a sketch of this kind can only touch upon the more prominent parts of a subject of such magnitude and interest.

I. The first great *political* division of the interior, next to the colonial limits, is that under the Amakosæ Tribes or Caffers Proper, bounded from the Colony by the Keiskamma river on the west; by part of the Ombashee river on the east; by the Ocean to the south; and on the north by the secondary range of Mountains, a subordinate ridge to that vast chain proceeding from the Colony, and keeping an average distance of about 100 miles from the coast, and which, there is every reason to believe, (running behind Delagoa, as far as which it has been traced,) joins the Lupata range at the Zambezi river, whose existence has not only been doubted, but absolutely denied. It is well watered, and the following are its chief streams.

The 'Keiskamma—with rather a short course—rises in the Winterberg Mountain, which is snow-capped for several months in the year, and the parent of rivers which reach both the southern coast and the Orange river, and through that extensive drain the Atlantic Ocean,—falls into the sea about lat. 33. 12. long. 27. 40., and appears to be open to navigation; its shores at its estuary possess every material for building, as well as every other advantage for the formation of a civilised establishment.

The 'Koncay or Buffalo river is the next in order, and of equal length with the Keisikamma; a Wesleyan Mission Station of some promise is situated upon one of its branches; its mouth is about 20 miles from that of the Keisikamma.

The Goonobie or Brambleberry river follows next in magnitude, and is about 20 miles beyond the last mentioned.

The 'Kwelegha blends its waters with the ocean 20 miles in advance; it is a considerable river, and equal to the Keisikamma.

The 'Kneiba or 'Kei, the *White Keys* river of the maritime charts, fall into the sea, in lat. 32. 35. long. 28. 30.; it is a

very large stream, and waters a wide extent of country; its sources are in the Stormberg Mountains, 160 miles direct from the coast, a part of the great range alreadly alluded to, from which it issues by seveal *spruits* or branches in the Tambookie country, of which I shall have occasion hereafter to speak. The principal of these branches are the Stormberg, the Zwart Kei, the Ameva, and the Somo, the latter crossed for the first time by civilised men under W. van Reenen's party, in search of the Grosvenor, Indiaman. These various spruits join previous to entering the Amakosæ territory, where together they form the Witte or White Kei, or KEI river.

The 'KOBAKNABBA, whose estuary is about eight miles from the mouth of the Kneiba, is rather a large stream fertilising a long and populous valley, and next is the KOGHA of similar size, near which the wreck of the French vessel L'Eole took place in 1829 at that part marked in Commodore Owen's survey as *Sandy Point*.

The 'GNABBAKA, 20 miles from the last named river, is also a fine stream, much like the last named.

The OMBASHEE is a large river, having several tributaries in the secondary range of mountains in the Tambookie country. This river forms the extreme boundary of the Caffres Proper, whose territory it enters at about 25 miles from the coast; it is supposed to be navigable.

The superficial extent of the territory of this tribe may be estimated at about 5,000 square miles; it is generally more fertile than the Colonial possessions, much better timbered, and more abundantly watered, numerous small streams intervening between those just named, but which are not open to the sea, except at the time of freshets, being blocked up by sandy bars. Rain is frequent, chiefly in summer, the dry season being in the winter. The surface of the country is very much broken by ravines, filled with a thick jungle of bushes, while the more level spots are covered with forests of that graceful and odoriferous tree, the Mimosa Capensis; its birds, its insects, and its botanical treasures are rich, varied, and unrivalled, and offer a field "white to the harvest" for the collector, gleanings alone from which have yet been gathered. Game, that is, objects of the chase are rare, the native hunters having almost exhausted the quarry.

The Amakosæ tribe, inhabiting this country, has already been described by several writers; and its history brought down to very late periods. BARROW, LICHTENSTEIN, and BURCHELL have each contributed their collections to our stock of knowledge of this people. To THOMPSON'S work some very interesting notes are appended by one of the Missionaries, the Rev. Mr. BROWNLEE, and an extremely well drawn up paper on the subject by

Mr. Assistant Surgeon MORGAN, has just been published in the Journal of the South African Literary and Scientific Institution. These details, generally accessible and well known, render it unnecessary for me to enter upon a subject which would soon exceed the limits prescribed by this paper, and which I already feel I have greatly transgressed.

II. The next division is that of the AMATYMBÆ or TAMBOOKIE Tribe of Caffres, the supposed progenitors of the Amakosæ, from whom they are now most distinctly divided as a nation. Their country is situated behind the latter named people. The Zwarte Kei, rising in the Winterberg, and the Stormberg river, so named from the mountain inwhich it first bursts into existence, separate them from the Colonists; the grand northern range of mountains from the Bechuanas of the Orange river, a somewhat undefined and undulating line along the subsidiary ridge until it touches the Ombashee river, from the Amakosæ, and thence in a north-easterly course to one of the sources of the Omtata river, from the neighbouring tribe the Amaponda.

The extent of this territory comprises 6,000 miles, and can only be *contrasted*, not compared with that of the Caffres Proper; it is poorly watered, the streams which intersect it, the heads of the Bashee, Omtata, and Kei rivers being merely a succession of pools, except in the rainy season. It is composed of extensive, elevated, dry, and unsheltered plains, a real karoo or desert, parched by a burning sun in summer, and chilled by excessive cold in the opposite season. Trees, and those even of stinted growth, are only found along the banks of the rivers, giving by their dark and regularly marked lines to the spectator from any elevation, a map-like appearance to the country, the intervening spaces being destitute of any shrub of more than a few inches in height. The pasturage is, however, luxuriant at certain seasons; its growth after rains appears almost miraculous, but droughts of months' and sometimes of years' extent render a large portion of this country permanently uninhabitable, and thus perpetuating, as it must have originated, the nomadic manners of the race, which at present finds a wretched and precarious subsistence on its inhospitable surface.

The Natives partake of the character of the regions they occupy. While the Caffre Proper is a daring savage, warlike by disposition, imposing in appearance, and independent in character, the Tambookie or Amatymba is mild even to timidity, more frail in person, and cowardly almost to imbecility in danger; he is assailed by the Bushman from the north, by his brother Caffre on the south, by the marauding and predatory tribes from the east, and maintains an uncertain tenure of his native territory; he is kept constantly in a state of almost

pauperism, famine frequently stalks with its gaunt form through the kraals of his people, and yet the Tambookie, unlike the Caffre, seldom if ever crosses the colonial boundary to abstract any of the numerous herds, which feed within his very sight; but when pressed by hunger or alarmed by danger, he comes in peace, tells his woe-begone tale to the Colonist, is fed, advised, and instructed, and returns the friend of the white man. Such has been the state of the relations between our remoter Colonists and this Tribe for a very long period, while that of the southern neighbourhood, civilised and savage, has been one of mutual encroachment and sanguinary contest.

I have pointed out the principal features of the two foregoing divisions of the country *separately*, because occupied by two great *political* communities—the Amakosæ and Amatymbæ people. As there are beyond these to the frontier of the Zulo power no longer any considerable societies of men *nationally* bound together, like the beforementioned people, but a mere succession of numerous but small and broken hordes, the wreck of formerly populous tribes subdued by the Zulo tyrant and conqueror Chaka, and other depredators upon a lesser scale set into motion by his example, I am obliged to describe the intermediate country according to its natural divisions; and in doing this I shall generally assume the larger rivers as boundaries of Tracts or Cantons, of which I presume to give as brief and concise an account as possible.

III. In the first place, then, I take from the Ombashee river to the Omzimvooboo, the St. John's river of the charts.

This tract will contain about 7,200 square miles; it is fertile in an extraordinary degree, highly picturesque, well watered by numerous rivers and copious streams constantly flowing. It is, however travelled over with great difficulty, and loss of time, being intersected every few miles by deep ravines.

The *Kogha*, Impaakoo, Omtata, Omtongala, the two Omgazis and the Omzimvooboo, water this extensive region, the first of which is a well supplied stream.

The *Impaakoo*, a smaller river, is remarkable from its waters passing into the ocean through a singular arched aperture in the rocks, which has been named by Commodore Owen, when surveying the coast, under the appropriate name of "the hole in the wall." It is situated in lat. 30. 5., and lon. 29. 8.

The *Omtata* rises from two distantly separated sources in the great range of mountains, collecting tribute from numerous streams, and combines with the sea in about lat. 31. 5., and lon 29. 15. It has a tide-way of eight miles, and appears to be open for shipping. Upon its western sources it was that the marauder Matuana was attacked by Major Dundas, and within a month afterwards by Colonel Somerset in 1828, and

his predatory band entirely routed, to the salvation of the Caffre nations, who would there is every reason to believe, if unsupported, have been totally destroyed. This stream is represented as very beautiful, maintaining a canal-like appearance by its evenness of width, unlike most of the rivers to the westward, having but little jungle, but plenty of fine timber, and it could easily be led out, if requisite, for the purposes of irrigation.

The *Omtongata* succeeds as next in consequence, at about 10 miles in advance, and the greater and lesser Omgazis, the Mogassie of the traveller William van Reenen, follows at another advance of 20 miles, at the mouth of which, according to report, there is a fine but small inlet or Bay.

A very few miles farther brings us to the Omzimvooboo, the *Sinwowoe* of Van Reenen. The native name is translateable as the Great Sea Cow river, of which animal it is full, and is the St. John's river of our hydrographical maps. It is one of the largest streams on the coast, rises in the Ingale or Snowy Mountains, the great range already so frequently mentioned; its eastern source is called Omsimclaff, and it is joined by five very considerable branches from the westward. This stream forms a mighty barrier, or rather gulf, between the eastern and western territories, and has along its whole course of above 100 miles direct but two or three passes, from the steepness of its rocky banks, which near the mouth are from 1,500 to 2,000 feet high; in fact, it appears that some extraordinary convulsion has here split a solid mountain in two, to allow the escape of its impetuous waters. A road, with much difficulty, has been made by the indefatigable Caffre Traders from the Colony down this awful deep, and wagons now easily pass through it, on their way to and from the Colony to Natal. At its estuary the width is about 400 yards, spreading inside into a splendid and perfectly sheltered basin. It appears to be the most capable of entrance of all the rivers to the eastward, and Lieut. King of the Royal Navy, who minutely examined it in a boat, had determined to enter it with his vessel, but death, unfortunately for him and the cause of civilization, prevented this important project being carried into effect. The Omzimvooboo enters the sea in lat. 31. 30. and lon. 29. 25.

The inhabitants of this country belong to the race called Amapondas, whose territory formerly reached to the river Omtavoof, 7 miles beyond St. John's, but now, in consequence of the conquests of Chaka, few are found beyond the last named stream. They are a superior race to the Caffres, although evidently derived from the same common origin, more cleanly in their residences and persons, greater cultivators of the soil, and have in former times been a very powerful nation.

They are now to be seen under great disadvantages from the effects of the distress to which they have been reduced by the complete plunder of their herds, and hurried, as they have been, from one situation to another by the cruel and ambitious Zoolas.

Besides this people, a most interesting little tribe occupy a portion of the country I have just described, whose existence has already been made known by W. van Reenen in 1790, when in search of the survivors from the Grosvenor, Indiaman. I allude to the descendants of Europeans wrecked on this coast, the re-discovery of whom has awakened long slumbering sympathies for the fate of the parties saved from that dreadful scene of destruction. The expedition of Major Dundas in 1828 already mentioned, was the first since the time of Van Reenen, which fell in with these people, of whose history and present circumstances, our late intercoursee with the interior has given us frequent opportunities to procure information,—a considerable mass of facts connected with which I have been able to collect, but they are by far too voluminous for this paper.

IV. From the Omzimboo to the Omtavoomo river is a distance along the coast of 55 miles, and the divison I have marked by these boundaries contains about 2,000 superficial miles. It is almost destitute of human inhabitants, a few only residing close to the first named streams, and belonging to the Amaponda race, having been depopulated by the fire-brand and spear of the Zoola conqueror, whose march has been well traced by our traders, by the innumerable remains of human skeletons with which the whole country is strewn.

The Omtavoomoo river, whose source is 70 miles long, and whose estuary is in lat. 30. 55. and lon. 30. 7., is a great physical line of demarkation, and forms a perfect boundary between the north-eastern and south-western part of the coast, distinguished by the comparative severity of its temperature and climate, the cold being intense and rains very frequent, as well as by the difference in its vegetable production. The Wild Date and Bannana which are common beyond this division entirely ceasing to exist westward of this stream.

All the seaward portion of this tract is covered by dense woods and possesses the most magnificent forest scenery. Its trees have been represented as generally very different from any of the colonial kinds, and one especially has received the homage of most of the travellers, but unfortunately not yet of a botanist. It is chiefly found in the extensive woods near the Omzimvooboo river, and is described as being seventy feet in height, perfectly straight, when it at once spreads into a canopy

of foliage quite flat, and impervious both to light and to rain; the top of a single tree in the dense mass of other kinds appearing from the neighbouring heights like a fine grass plot, and when several are together like fine lawns. One specimen has been particularly noticed by Messrs. Cowie and Green as shading a circumference 20 yards in diameter, the leaves were 11 inches long and 1½ broad, and deeply serrated.

The inner range of country is much more free of wood, and consists of large plains, but so swampy as to be travelled over in a direct line with much trouble. Game is abundant, and, since the spoil of the flocks of the inhabitants by their conquerors, has mainly supplied them with food, and enabled them to collect fresh herds from their westerly neighbours by the sale of antelope skins, especially those of the Blue Buck, the Antelope Pygmea, a favorite and costly ornament used for the head-dress of the Caffre Belles. Laws of great severity have, therefore, been enacted and scrupulously administered to protect this now important branch of trade and the various chiefs have respectively assumed a landed proprietorship over several forest districts, which they either hunt themselves, or let out at high prices for determinate periods to parties of native adventurers, and thus creating a novel and lucrative source of wealth, to repair their previous and ruinous losses.

The coast from the Omzimvooboo or St. John's River, to the Omtavoomo, is one continued bed of elevated rocks, without one patch of sand. Oysters are most abundant along this whole line, and of the most delicious kind. Most of the rivers and rivulets with which the country is almost incessantly intersected, precipitate themselves over these rocky ledges into the sea in numerous and beautiful cataracts, more than one of which are said to have a fall of full three hundred feet.

It was on this iron-bound and inhospitable shore that the Grosvenor East Indiaman's wreck occurred in the year 1782. This catastrophe took place about seven miles westward of the Omzimcaaba river, or in lat. 31. 10. and lon. 29. 50., where eighty-six pigs of iron wedged in the rocks, five large guns, a quantity of iron ballast piled up, which the tradition of the natives represents as having been the forge of the blacksmith of the vessel, who chose to remain among them rather than brave the dangers of an exploratory journey into the interior in search of a rescue, and who died at a very late period,—attest this place as the awful scene of one of the most destructive and melancholy shipwrecks with which we are acquainted. It has also been supposed, from the immense quantity of drift wreck in which cocoa-nuts are frequently found, and which accumulate on the rocky shore in an extraordinary manner, that

the force of the waters passing through the Mosambique Channel expends itself at this part of the coast, or, to use the more significant phrase I find in the notes from which I partly make this compilation, that this is the *tail* of the great Mosambique current.

V. The Terra de Natal, the next division, commences at the Omtavoomoo river, and is bounded on the east by the Omtongala or Fisher's River of the charts. Its superficial contents are about 9,000 square miles. It is a natural division, possessing similar productions and the same climate, and distinguished from the north-eastern country, which is hotter, less healthy, and more arid, and from the south-western, which is cold, damp, and variable.

The chief rivers which water this delightful region are the Omzimvooboo, the Omcoomas, the streams which fall into Natal Bay, the Omganie, and lastly the Omtongala.

The Omzimvooboo, or Great River, which its native name imports, is a large stream, emptying its constantly replenished reservoir into the ocean in about lat. 30. 30. lon. 30. 25. Its estuary appears to be accessible to shipping; it has a course of above 90 miles, is full of fish, especially eels; haunted by a number of hippopotami; and its wooded and picturesque banks are thickly populated by that real monarch of the forest, the stately and sagacious elephant.

The Omcoomas, or Cow River, is a very large stream, and open at the mouth. Its first drift or ford is about four miles from its estuary, at which place the river is 150 yards wide, and three feet deep. Like all the other streams along the coast, it is remarkable for the translucency and sweetness of its waters. Wild fruit of some very fine and large kinds, worth, it is imagined, to be introduced into our gardens, are said to be abundant in the neighbourhood. Alligators begin to be found here, and a species of the Boa is said to infest the woods.

The harbour of Natal is situated in lat 29. 53. and lon. 30. 55.; is about 3 miles in depth by $2\frac{1}{2}$ in breadth, containing three small islands, easy of access from the shore at low water. The eastern side is a low sandy flat covered with wood, reaching to the margin of the sea, and at high tide presents the singular appearance of an inundated forest. At the head of the bay is a large plain covered with trees, bamboo, and long grass, but swampy near the water. Three small rivers discharge themselves through this plain. The western side is protected by a bluff point of land, covered with bush, which has inside of it fine anchorage and careening ground. The entrance is about 300 yards wide at high water, and the depth at this time 12 feet, which at the equinoctial tides exceed 14.

It is recommended in attempting to enter this port, for vessels to proceed with a westerly wind northwards to Omtongala or Fisher's River, to prevent being carried to the westward by the current, when the usually short duration of the westerly wind enables the navigator to enter, taking advantage of the tide and an easterly breeze.

The banks of the Omganie river are described as very beautiful, from its romantic rock scenery. It is about 150 yards wide at 1½ mile from its mouth, which is situated in about lat. 29. 50. and lon. 30. 55. It offers every possible advantage as a future settlement for a civilized population, having abundance of limestone and chalk, fine timber, a rich soil, most luxuriant pasturage in the world, the capability of irrigation, if required, for thousands of acres, and a land-locked harbor within six miles. Bananas grow spontaneously in this highly favored region.

The serpentine Omtongala, the Fisher's River of the charts, bounds the rich and delightful district of Natal. It is second only in size to the St. Lucia and Mapoota Rivers, and it rises in a breach of the Ingale or Snowy Mountains, about 250 miles from the coast, where it disembogues in about lat. 29. 20. lon. 31. 25., being fed along its lengthened course by innumerable tributaries. Its extreme breadth is from 1 mile to 1½, and its first ford, six miles from the mouth, is 200 yards across, A large salt pan exists near its source, but very difficult of access, and lower down is a warm bath sufficiently hot at times to boil an egg.

The climate of this division is salubrious throughout the year, suffering no great extremes. Rains generally arrive with the westerly wind, but seldom last more than three or four days together, when the east wind springing up clears the atmosphere. The east and westerly winds are the most prevailing.

The planting season commences in July, and the country corn continues to ripen from the month of January to that of May, so that there is a constant harvest during those months.

The soil coastwise is generally sandy, but capable of raising most luxuriant crops of Millet and Maize: proceeding inland it assumes a reddish hue and loamy stiffness, changing as it recedes to a black and deep mould, until at the end of the base of the mountains it becomes gravelly and stony.

The country is covered at intervals by forests of considerable extent, but which are difficult to explore from the impervious nature of the underwood. Trees of large size are rare about the port itself, although the smaller kinds are most plentiful. At the distance of 50 miles, however, are extensive woods, containing trees of the largest dimensions, and in the Impen-

sewan or Ingale Mountains are inexhaustible supplies of ship and other timber easily transportable to the harbor.

The native inhabitants of this territory are at present the wretched and scattered remains of that once populous race described by Capt. Woodes Rogers and other navigators in the 17th century, as remarkable for their Arcadian felicity, their innocence of manners, and humanity to strangers. By the ambitious policy of the late Zoola chieftain, they have been dwindled down into a small number of fugitives, finding a precarious existence from the indigenous and wild produce of the field.

Besides these people, there is a considerable number of Europeans, from the Colony, settled round the port, for the purpose of trade; but of late a want of confidence in the Zulo ruler, Dingaan, and of unanimity among themselves, arising out of a petty and misplaced jealousy of each other's success, has brought this flourishing settlement into a very low condition, and which if not soon supported by the arm of a recognised Government must be altogether abandoned.

Does the fabled Lotus grow in this portion of Africa, of which all who have eaten desire to remain, and all those who have roamed from its feast pine to return? Is there a *maladie du pais*, a sickness not of home, but for a foreign land, generated by the atmosphere of this clime, barbarous only as respects its inhabitants? or why is it, that no one individual, whatever his pursuits, whatever the circumstanses which have thrown him upon, or directed his steps to this land,—Trade, Science, or Misfortunes,—but seems enraptured with the natural beauties of the country? The wrecked mariner, even while despairing of returning to his civilised home, has not withheld his meed of praise,—the adventurous trader, searching for his profit thus far from home, has expressed a frequent wish that this was "his own, his native land," and the only scientific visitor to these regions declared a wish to live and die there. There must be certainly something extraordinary in a country to call forth so general a testimony in its favor.

VI. The next division is that comprised between the Omtongala and St. Lucia Rivers, including the numerous branches of the latter, and probably contains about 10,000 square miles. It is the chief seat of the Zulo power, and was acquired for that nation by its conquests from numerous divided tribes, formerly its inhabitants.

Four large streams fertilize this territory, besides innumerable others of smaller size; but it is not so well watered as the preceding divisions.

The Amatekoola, or Great River, rises in the secondary range of mountains, is open at its mouth, situated in about

lat. 29. 12., and lon. 31. 34, and is frequently subject to great floods.

The Omlelaas, or King's River, is said to have seven feet water on the bar at low water, and it disembogues itself in about lat. 29., lon. 31. 40.

The Omslatoos is open at its estuary, and has a fine sheltered basin itside its mouth; is about 18 miles in advance of the Omlelaas.

Between the Omslatoos and the St. Lucia, several streams enter the ocean, but as the country has hardly been trodden by European feet, little is really known respecting them.

The St. Lucia or Omvaloozie, which latter is its native name, is a stream of large magnitude, deriving its chief supplies from three great sources originating in the inner range, or Ingale Mountains, and called respectively the *Valoozie Imtlopie*, or White Valoozie, *Valoozie Innami*,, or Black Valoozie, and the *Valoozie* itself. From the secondary ridge a number of considerable streams pour their waters into the principal river, and having all united into one common channel, 15 miles from the sea, where it takes the name of Omvaloozie, it discharges itself in lat. 27. 45., and lon. 32. 32. The principal branch, the Black Valoozie, is described by Messrs. Cowie and Green at 63 miles from the sea, where they passed it on their road to Delagoa, as deep and above 100 yards wide, dangerous to cross from the number of quick-sands and the alligators, with which it swarms; its banks are swampy, covered with rushes, and overgrown by the wild fig-tree, of very large dimensions, some measuring six feet in diameter.

The climate and appearance of this division is very different from that of Natal: towards the sea are extensive plains, sandy and swampy, above which the country is mountainous and generally bare of wood, although there are some few fine forests of timber trees. The heat of the summer is almost insupportable. Metallic ores are said to be abundant, and it has also been asserted by several visitors that silver is to be found here, but that a superstitious dread on the part of the natives prevents the old mines, or rather the excavations, from being re-opened.

The whole of this division is rife with human existence, the Zulos having selected it as their country, and pitched their chief kraal or capital, called Nobambe, on the heights above the Zimtlanga, a stream which falls into the White Valoozie. To give an account of this nation, by far the most extraordinary and interesting of those who inhabit the African Continent in modern times, of their amazing conquests which have extended over an area of 160,000 square miles, their manners, policy, government, and other matter essential to the descrip-

tion of a people, would be impossible within the limits of the present notice, which has already overgrown its proper size.

VII. From St. Lucia to Delagoa Bay is a tract of 10,000 square miles, almost destitute of inhabitants, the Zulos having devastated the country in their mad career of bloodshed and rapine. This region for a long distance inland is low and marshy, which character it preserves, it is said, as far as Mosambique. It teems with animal life of all descriptions, among which are also those of the most noxious and dangerous kinds, Lions, Tigers, Alligators, and Snakes of great variety, including the Boa.

Inward from the coast the country becomes hilly until it reaches the Ingale or snowy range of mountains, whose summit is one vast plateau, destitute of wood, rocky but affording good pasturage; inhabited by small kraals of Bichuanas and a few scattered families of Bushmen.

Compared with the divisions already enumerated, water is much scarcer as we proceed towards Delagoa, and the rivers are found at wider intervals, the chief of these are, the Omcoos the Pongola, and the Mapoota.

The Omcoos rises at a long distance from the coast, but its entire course has not yet been traced, its estuary is supposed to be the same named in the charts as the Gold Downs' River, situated in lat. 27. lon. 32. 50.

The Pongola is a fine stream, and was formerly the seat of a native state of some consideration: it has lately been stated that the Gold Downs' River of the charts, and the Pongola, are identical, but without sufficient authority, while, from the map sketched by Messrs. Cowie and Green, the Pongola is made to fall into the Mapoota.

The Mapoota, La Zoota of the natives, is the largest river of the country, its sources are unknown, but supposed to be in the northern side of the Ingale Mountains, somewhere behind Natal; it has water sufficient for vessels of 60 tons burthen, as high as 30 miles from its mouth, and a boat navigation for a long distance beyond; its width varies from 50 to 500 yards; its banks are covered with dense forests for 40 miles, when the country taking a rise they begin to disappear; the scenery, as described by several visitors, must be very majestic.

(To be continued.)

Abstract of a Return respecting the Climate of Fort Wiltshire, for* 1832.

[Extracted from the Annual Report of Staff-Assistant-Surgeon N. Morgan, and published by permission of the Principal Medical Officer.]

	WINDS.				
	East of Meridian.	*West of Meridian.*	*Prevailing Winds in a Polar direction*	*Number of days on which rain fell.*	REMARKS.
January	22	9	Southerly	2	Rain very slight.
February	whole A.M.	whole P.M.	Southerly	2	Rain slight, dews heavy.
March	whole A.M.	whole P.M.	Southerly	1	Days warm and nights cool.
April	19	11	Southerly	7	Weather cooling gradually.
May	4	19	Southerly	6	Dry and cool.
June	3	28	Southerly	3	S W. winds stormy.
July			Southerly	3	Cloudy and strong N.W. winds.
August	whole A.M.	whole P.M.	Northerly	5	Showers frequent, hot, and slight.
September	4	26		6	Dry and cloudy.
October	0	31	Southerly	8	Cloudy and sultry.
November	14	16	Southerly	9	Hot and hazy.
December	11	20	Southerly	5	Variable.

Mean Temperature of the Months by Observations at 10 A.M. *and* 3 P.M.

Jan.	Feb.	Mar	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
84º 1	79 5	75 1	72 7	67 5	63 3	60 3	66 3	69 9	78	80 6	82 2

* Fort Wiltshire is situated close to the Keiskamma River, and in a great measure surrounded by high grounds which form the banks of the stream.

A Table of the Latitudes, Longitudes, &c. of certain Stations in South Africa, as ascertained by Wm. Burchell, Esq.

STATIONS.	Latitude. South.			Longitude. East.			Distance from Cape Town.	Magnetic Variation
Cape Town, - - -	33°	55'	40"	18°	23'	11"		
Verkéerde Valley, *Karoo*, -	33	24	2	19	59	30		
Tys Kraal, Juk's River, *do.*	32	46	52	20	42	20		
Wind Heuvel Station, *do.*	32	45	18	20	53	30		
Fieldcornet Gerrit Snyman's, *Karoo*, - - - -	32	46	45	21	1	10		
Karrée River, *Nieuweldt*, -	32	3	38	21	50	20		27° ¼ W.
Dwaal Rivier, *Bushman's Flat*	31	40	0	22	12	0		
Zak Rivier, *do.* - -	31	33	32	22	14	40		
Klip Fonteyn, *do.* - -	31	0	38	22	37	40		
Buffel-bout, *do.* - -	30	20	47	23	1	50		
Modder-gat, *do.* - -	29	59	1	23	16	50		
Zand Valley, *do.* - -	29	48	2	23	23	0		
Orange River, *near Brieskap Ford* - - - -	29	40	52	23	27	20	701 miles	
Klaar Water, *Griqualand*, -	28	50	56	24	3	0	791 —	27° W.
Confluence of the Ky-Gariep with the Nu-Gariep -	29	4	22	24	26	50		
Graaff-Reynet - - -	32	15	19	25	0	40		
Kosi Fonteyn *between Klaar Water and Krúman* -	27	52	16	24	0	0		
Krúman, *near Latakoo*, -	27	22	25	24	13	50		27° ⅛ W.
Latakoo, - - -	27	6	44½	24	39	27	972¼ —	
*Chue Spring, *N. of Latakoo*	26	18	11	—	—	—		

* The most northerly Station reached by Burchell.

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 192.

Sub-genus Antilope.—*Horns common to the males only, never truly lyrated, seated below the frontal crest, often sub-spiral or spiral; suborbital sinus developed; inguinal pores; small bare space for a muzzle; two mammæ; knees often tufted. Gregarious, or in families mostly on open plains.*

Antelope Melampus. (The Pallah.) The adult male above three feet high at the shoulder; nearly five feet in length. High on the legs; the horns black, about twenty inches, ascending obliquely upwards and outwards, and midway at an obtuse angle, obliquely inwards, rough and coarsely annulated at base, smooth at tip; ears seven inches long; general colour fulvous; brown on the back; beneath and legs white, with a black spot round the spurious hoofs, and a dark streak sometimes double on the buttocks; tail white, eight inches long, without a tuft; no brushes on the knees.

Inhabits South Africa.

Antelope Melampus, Lichtenstein, Desmar. Pallah, Daniell. A. Pallah, Cuvier. Pallah *of the Booshwanas.*

Antelope Forfex, H. Smith. (The Gambian Antelope?) Male about twenty-five inches high at the shoulders, rather bulky in the carcass; horns a foot long, black, close at base, slightly bent forwards, then opening laterally with their points again turned inwards, annulated with twelve rings, the tips smooth; forehead broad; nose tapering with incipient black muzzle; ears large, open, with tufts of long hair hanging out of the conch; lengthened lachrymary opening; general colour fulvous dun; space round the orbits and inferior parts white; tail short, with black tuft; dark streak down the front of the legs, with spot on pastern joints; small dark brushes on knees; female smaller; two mammæ; no tufts on the ears.

Inhabits Central and West Coast of Africa.

Gambian Antelope, Pennant.

Antelope Adenota, C. H. Smith. (The Kob?) Male about twenty-six inches high at the shoulders; horns at base nearly vertical, spreading outwards, then bending back, tips slightly forward, nine inches and a half long, robust, black, striated, compressed at base, with ten semi-annuli on the anterior side, and the points smooth; head long, pointed, terminated with small black muzzle; general colour fulvous bay; space round orbits, lips, and under parts white; a small glandulous tubercle

on the loins, from whence the hairs whirled in a circle over the body; a dark streak on the anterior face of the legs, with a band of the same colour at the fetlocks; a dark brush on the knees; tail short, wholly covered with long black hair; female resembling the male, but without horns.

Inhabits Central and Western Africa.

Le Kob? Buff. A. Kob? Desmarest. Petite vache brune?

Sub-genus REDUNCA.—*Horns in the males only, placed behind the orbits, black, reclining, tips bending forwards, annulated below, above smooth, short, slender; ears long, open, oval; imperfect suborbital opening; a small muzzle; inguinal pores; no tufts on knees; tail not longer than the buttocks; fur rather long, wavy; structure in general more robust; legs shorter; mammæ four; not gregarious; residing variously.*

Redunca eleotragus. (The Riet-bok.) Adult male two feet ten inches high at the shoulder, four feet six or eight inches long; ears six inches; tail nine or ten inches; horns ten or twelve inches long, recumbent below the plane of the face, divergent, regularly curved with the points forward, wrinkled at base, and annulated with obsolete rings in the middle; general colour ashy-grey tinged with ochre, beneath white; hair of the throat long, hanging down, and whitish: female smaller, in other respects resembling the male.

Inhabits South Africa.

A. Eleotragus, Schreb. Desmarest, &c. A. Arundinum, Bodd. A. Arundinacea, Shaw. Riet-bok *of the Cape Colonists.*

Redunca Lalandii. (The Nagor.) Adult male two feet eight inches high, four feet eight inches long; head nine inches; horns six inches long, approximating, at base a little compressed, not much divergent, sub-erect, bent forwards, with five obscure semi-annuli separated by striæ in front, points smooth, approximating; middle sized dark muzzle; ears long; head and neck tawny; back fulvous brown; with a cast of purple; the hair long, hard, loose whirling in various directions; chin and lower parts white; the tail with much long hair, the base dark, the middle fulvous, and tip white; legs strong fulvous: the female marked in a similar manner.

The young entirely pale rufous, is the Nagor of Buffon.

Inhabits Western and South Africa,—lives among rocks.

A. Redunca, Pallas and Auctor. A. Reversa, Pallas. Le Nagor, Buff. A. Fulvo Rufula, Afzel. Goldfus. is the adult. A. Lalandiana, Desmarest, the female. Rooye Rhee-bok *of the Cape Colonists.*

Redunca Isabellina. (Cream-coloured Antelope.) The male two feet six inches at the shoulders, four feet ten inches long;

head ten inches; horns eleven inches, robust at base, approximating, parallel along the plane of the face, the points turned forwards, round, shining, obliquely annulated, six or seven in front, eight or nine in rear; naked, triangular spot before the eye; hair rather long, standing off, the shorter brown, the longer grey, forming a cream-colour, whirling in several places.

Inhabits Caffraria.

A. Isabellina, Afzelius.

Redunca capreolus. (The Rhee-bok.) Adult male two feet five inches at the shoulder, four feet six inches long; head eight inches; horns eight inches and a half long, straight, vertical, slightly inclining forwards, round, slender, with thirteen rings, sharp pointed; black spot before the eyes; suborbital sinus large beneath; muzzle round; the neck long; body very slender; general colour whitish grey, with a cast of buff; beneath white; hair very soft and villous; tail five inches, grey, tipt with white; female smaller, but similar in colours; four mammæ.

Inhabits South Africa,—in small troops.

A. Villosa, Burchell, *MS.* A. Lanata, *Dict. d' Hist. Nat.* Rhee-bok *of the Cape Colonists.*

Redunca Scoparia. (The Ourebi.) Adult male twenty-two to twenty-four inches high, four feet long; head eight inches; horns nearly vertical, slightly bent forwards, five inches long, with six or seven wrinkles at base, and five annuli above them, round black points, smooth; lachrymary sinus well defined; small muzzle; tufts on the knees; general colour of the face and back tawny, or pale fulvous; a whitish arch over the eyes; under parts white; the throat and breast with loose white hairs; tail short, blackish; the hide sometimes black: female the same, with brushes on knees; no horns.

Inhabits the plains of South Africa.

A. Scoparia, Schreb. et Auctor. Ourebi, Pent. *Supp.* Buff.

Redunca Montana, Cretzschmar. Prevailing colour a beautiful light brown, which is darkest on the top of the head and lightest on the cheeks, the extremities and sides of neck and body; the breast, belly, inner surfaces of extremities and hinder parts of buttocks, white; each eye crossed by a white stripe that increases in breadth but becomes less distinct as it descends; forehead broad; nose short; horns placed on the edge of the forehead, straight till near the points which are inclined forwards and upwards; ears without, grey-brown, within white, their edges towards tips margined with brownish black hairs; an oblong black blotch on the nape, and below the ears, in the parotid region, a small bare black spot, margined on its upper

edge with white. Lachrymary slit, arched and extending downwards and backwards from the inner canthus of each eye, lower part of neck near breast with a strong hair comb, the anterior portion of which is brown, the posterior portion white. Length from nose to root of tail two feet six inches; length of tail nearly two inches; height at shoulder one foot seven inches and a half, at rump one foot eight inches.

Inhabits Africa,—hilly regions near the western branch of the Nile.

Obs. This species bears considerable affinity to the *Redunca scoparia* or *Ourebi* of South Africa.

Sub-genus Oreotragus.—*Horns short, slender, vertical, and parallel, with very few annuli; suborbital sinus conspicuous, and marked with a dark spot; head short, the superior edge of the orbits projecting; body and legs when compared with the size, rather robust, hair of a singular structure, being hard, flat, spiral, flexible, and erect upon the skin, with the tips turned back or reclining; females hornless; in other respects resemble the male; inguinal pores and two mammæ*

Oreotragus typicus. (Klipspringer.) Adult male twenty-one to twenty-two inches high, three feet seven inches long; form robust; head short, round, and broad; horns about five inches long, distant, round, vertical, slightly inclined forwards, obscurely wrinkled at base, and annulated in the middle, tips smooth and pointed; legs robust; pasterns rigid; fur standing off spirally-twisted, hard, ashy at base, brown in the middle, yellow at the tips, forming an agreeable olive.

Inhabits the rocks and precipices of South Africa.

A. Oreotragus, Gmel. and Auctor. A. Saltatrix, Bodd. Sauteur des Rochers, Vosmaer, &c.

Sub-genus Tragulus.—*Horns in the males only, placed near or upon the orbits, shorter than the ears, black, round, vertical, distant, parallel, straight, inclining slightly forward or backward, mostly without annuli or wrinkles, and without striæ; the ears long; the body in general slender; high on the legs; delicate; head round; black space before and about the eyes; a suborbital sinus; small black muzzle; tail very short; inguinal pores; two mammæ; no brushes; all monogamous or solitary in various situations.*

Tragulus Rupestris (The Steen-bok.) Adult male twenty inches at the shoulder, twenty-two at the croup, three feet six inches long; head oval; snout pointed; muzzle black, ending in a point upon the ridge of the nose; horns vertical, straight,

parallel, round, slender, and pointed, one or two rudiments of wrinkles at base, not quite four inches long; ears longer, open, pointed; general colour chocolate-rufous, below white; groin naked and black; tail not protruding beyond the hairs; pasterns short.

Inhabits the bushes of high grounds in South Africa.

A. Tragulus Rupestris, Forst. Lichten. Tragulus, Desmar. A. Dama, Cuv. A. Ibex, Afzel. Steenbok *of the Dutch Colonists.*

Tragulus Rufescens. (The Vlackte Steen-bok.) Male very high on the legs, two feet six inches from nose to tail; horns reclining slightly with the points turned upwards, round, smooth, without wrinkles or annuli, parallel, three inches and a half long, one inch and a half asunder at base, two inches from tip to tip; ears four inches and a half long; head squarer than the former, small black muzzle; general colour bright fulvous red with a cast of crimson, beneath white; tail very short.

Inhabits the open plains of Caffraria,—very rare.

A. Rufescens, Burchell, *MS.* Vlackte Steenbok *of the Dutch Colonists.*

Tragulus melanotis, Afzel. (The Grysbok.) Adult male nineteen or twenty inches high, three feet long; head oval, six inches long; horns four inches, smooth, round, vertical, slender, inclining forward, one inch and a quarter asunder at base, three inches from tip to tip; muzzle small and black; ears four inches and a quarter long, broad, open; colour deep chesnut-red, intermixed with numerous single white hairs; beneath rufous.

Inhabits South Africa.

A. Grisea, Cuv. A. Melanotis, Lichtenstein. Grysbok *of the Cape Colonists.*

Tragulus pediotragus, Afzel. (The Bleekbok.) Adult male twenty-two to twenty-four inches high, three feet five inches long, very slender and light of form; head square; nose pointed; horns perfectly straight, inclining backwards, round, with an obsolete ridge in front, about four inches long, very pointed; black naked ring round the eyes; ears broader and shorter than the former; the tail near three inches long; general colour pale rufous fawn-colour above, and white beneath; females redder in colour; two mammæ.

Inhabits the plains of Caffraria,—*rare.*

A. Palida, Lichtenstein. A. Pediotragus, Afzelius.

Sub-genus CEPHALOPHUS.—*Horns in the male only,* small, straight, or nearly straight, reclining, placed high on the forehead, black, with wrinkles or annuli; muzzle rather developed, black; hair of the forehead lengthened into more or less of tuft or spread; a pouch opening between the orbits and nostrils, by a puncture or a slit, independent of the lachrymary sinus, which in some is wanting; without tufts on knees, one only excepted; posterns short; hinder shanks long; mammæ two or four; tail short, tufted; colours generally dark; stature middling or small; reside in covers or bushy plains. Solitary.*

Cephalopus silvicultrix. (The Bush Antelope.) Adult male three feet, and three feet two inches high, five feet long; head ten inches; horns reclining, four inches long, straight pointed, wrinkled at base, rugous higher up, smooth at tip, and slightly bent outwards; tail pendulous, with a brush; mammæ two; tuft between horns clear brown; general colour dark-brown above, with fawn-coloured longer hair over the spine and loins, greyish beneath; legs dark-chesnut; no tufts on knees.

Inhabits the plains and bushes about the Pongas and Quia in Western Africa.

A. Silvicultrix, Afzel. Bush Goat *of Sierra Leone.* Ant. des Buissons, *Desmar.*

Var.? *C. Platous,* (Broad-eared Antelope.) Specimen about equal in bulk to the former, but probably lower on the legs; head long and pointed; horns not five inches long, reclining, straight, divergent, irregularly annulated or rugous, pointed, and black; ears very wide, pointed, longer than the horns, whitish within, dun-coloured at the back; eyes large; a black spot on the cheek, marking the opening of the sinus; dark sepia streak on the chaffron, spreading in a coarser tuft about the horns; general colour brown, and fawn-colour above, whitish grey beneath; no tufts on knees.

Inhabits the mountains on the west side of Caffraria.

A. Platous, C. H. Smith, *MS.*

Cephalopus quadriscopa. (Four-tufted Antelope.) Adult male about the size of a roebuck, lower on the legs; head round: nose tapering; horns four inches long; reclining, staight, divergent, sharp at tip, with six or seven small annuli at base; ears wide, longer than horns, two black striæ inside; neck long; darkish streak down the chaffron; small lachrymary opening beneath the eye, and a naked line from thence towards the nose, indicating a second pouch on the cheek; forehead covered with longish hair of a dark colour; general colour brownish-

* In some of the species which are ranked in this Sub-genus the females have also horns.

yellow grey, beneath white, a faint lateral streak and several dark cross marks upon the arm; legs slender, with tufts on the knees, and tufts on the upper anterior end of the posterior shanks; pasterns short.

Inhabits West coast of Africa.

A. Quadriscopa, C. H. Smith, *MS.*

Cephalopus Burchellii, (Burchell's Antelope.) Adult male three feet five inches long, and about twenty-two inches in height; head seven inches long; ears six inches; the horns five inches, slightly elevated above the plane of the face, approximated, parallel, the superior third part alone bent slightly outwards, and the points inwards and forwards; they are black, round, obtuse at the point, six to seven wrinkles at base, then striated, and above this again irregularly wrinkled, striated, and annulated; no external opening of the lachrymary sinus visible, and suborbital pouch not very evident; ears wide, long, and open, marked with three striæ; a space of long bright fulvous hairs upon the forehead; chaffron black; general colour brownish, rusty above, ashy beneath; the limbs robust, and fetlock short and dark-coloured. It is possible that this is an old *A. Mergens* with the horns diseased, because the two are not exactly alike.

Inhabits Caffraria.

A. Burchelli, H. Smith, *MS.*

Cephalopus Mergens. (The Duiker Bok.) Adult male three feet two or six inches in length, twenty-one and twenty-three inches high; horns four inches long, more distant at base than in the former, more reclining, bending outwards, with a longitudinal ridge on the front, traversing four or five annuli of the middle, but not through the wrinkles at the base; forehead covered with a patch of bright fulvous coarse hair; ears five inches long, three dark striæ within; dark streak on the chaffron and down the front of the legs; a suborbital slit on the side of the face; general colour light brown above, and white beneath; tail short, black, tipt with white.

Inhabits South and Western Africa.

A. Mergens, Blainv. Cap. Merga, Foster. A. Mergens, Desmar. Duiker Bok *of the Dutch Colonists.*

Cephalopus Ptoox. (The Dodger Antelope.) Male about twenty inches high, and three feet long. More delicately framed than the former; horns three inches long, with three annuli at base, round, bent outwards reclined, without anterior ridge; a small pencil of vertial black hairs standing between the horns; rufous face and forehead; orbits prominent; lachrymary sinus a little prolonged, and further towards the nose a puncture, seeming

to open in a second pouch; nose almost ovine; general colour pale dun above, beneath white; a black streak down the fore shanks, and a spot on the hinder pasterns; tail short, dun, and tipt with black. This may be a variety of the former in a junior state.

Inhabits Southern and Western Africa,—chiefly Guinea.

A. Grimmia, Pallas. A. Ptoox, Lichtenstein. Grimea Antelope, Pen. The Grimm *of Leverian Museum in Shaw.*

Cephalopus Grimmia. (The Grimm.) Adult male seventeen and eighteen inches high, twenty-seven inches long; structure very compact, more clumsily built than the former, head thick, terminated by a muzzle; horns very short, stout, reclining, almost concealed in the long dark hair of the forehead, which forms a kind of point between them; face dark; ears short and broad; a lengthened suborbital slit, containing an unctuous substance beneath the eye, but no lacrymary sinus: general colour fulvous fawn, with dark ashy streak down the back; the inferior parts whitish, the legs dark, and tail longer than the preceding. Females darker.

Inhabits Guinea and Western Africa.

A. Grimmia, F. Cuvier. Capra Silvestris Africana, Grim.

Cephalopus Maxwellii. (Maxwell's Antelope.) Adult female about sixteen inches high, more slender in form than the last; ears longer; forehead square; nose more prolonged and pointed; a round muzzle; black spot beneath the eye, and on the cheek a puncture opening into the lower pouch; forehead and nose dark, a streak above the eyes resembling eyebrows; neck, back, and croup, dark-brown dun; beneath white; mammæ four yellowish, forming an udder; tail two inches long, black.

Inhabits Sierra Leone.

A. Maxwellii, C. H. Smith, *MS.*

Cephalopus Cærula. (Slate-coloured Antelope.) Adult male about thirteen inches at the shoulder, twenty-eight inches from nose to tail; head rather long, pointed, with small muzzle; no lachrymary opening, but suborbital pouch lower down, marked by a lengthened streak; horns one inch and a quarter long, recumbent tipts turned upwards black, pointed, with five semi-annuli; nearly concealed in the hair of the forehead; ears short, round, open; general colour slaty purplish-blue, beneath white; pasterns short, and legs buff; hoofs horn-colour.

Inhabits South Africa.

A. Cærula, C. H. Smith, *MS.* Blauwbok *of the Dutch Colonists.*

Cephalopus Perpusilla. (The Kleene-bok) Male about twenty-six inches long, twelve inches high; head shorter; forehead more elevated than the preceding; a suborbital sack as before; no lachrymary sinus; ears short and round; horns black, conical, slender, reclined, slightly turned inwards, nearly two inches long; incisor teeth broader; pasterns longer; hoofs smaller; general colour dull brownish-buff; beneath white; perhaps only a variety of the former.

Inhabits Caffraria.

A. Cærula, C. H. Smith, *MS.* A. Pigmæa, *Desmarest.* Kleenebok *of the Dutch Colonists,* and Noumetje *of the Hottentots.*

Obs. This is without doubt only a variety of the former.

Cephalopus Philantomba, (The Philantomba.) Young specimen eighteen inches long; horns very short, half an inch, the points just emerging from the long hair of the forehead; ears rounded at tip; long slit on the side of the nose; general colour dark-brown grey; legs dark; pasterns short.

Inhabits Sierra Leone.

May be the Guevie Kaior *of the Negroes.*

Cephalopus Natalensis, Smith. (Natal Antelope.) Colour of back and upper parts of sides a very deep bright chesnut; lower parts of sides, belly, and outer surfaces of extremities, a pale chesnut; lower portion of face blackish, rest of face and top of head reddish or chesnut brown, darkest along the centre line; crown of head surmounted by a bushy tuft of long hair, partly deep chesnut and partly black; sides of head, sides and under parts of neck, and inner surfaces of extremities towards body, tawny or a pale fawn colour; ears short and broad, the outer sides with a thin sprinkling of fine short black hair, the insides with a pretty close covering of whitish hair; upper parts of neck, pasterns, and hinder parts of houghs, dusky with a dull violet or greyish tinge; below and in front of each eye a narrow bare stripe of about an inch in length; tail, above, the same colour as back towards base, towards point dusky, the point itself obscure white. Horns nearly concealed by the elongated hair of the font, about an inch and a half long, finely striated longitudinally, the portions towards roots strong, that towards points very slender, and in most of the specimens examined exhibited an appearance as if the point of a small horn had been fixed upon a section of a larger one. Hoofs small, blackish, and pointed. Length from nose to base of tail two feet ten inches, length of tail four inches and a half; length of ears two inches and a half; height at shoulder sixteen inches;

height at croup eighteen inches.—In the female the colours are paler.

Inhabits South Africa,—in forests about Port Natal.

Sub-genus NEOTRAGUS—*Horns in the males only, horizontal, very small, with a few annuli or semi-annuli, black, pointed; no suborbital slit; head round; nose pointed, with a small muzzle; tail short; females two mammæ; size very diminutive.*

Neotragus Pygmea. (The Guevei.) Adult male about eleven inches high at the shoulders; nearly twenty inches in length; horns one inch and a quarter long, high on the head, rather close, bulky at base, with one or two prominent annuli, points sharp and black; a small lachrymary opening, but no slit; ears short, round; general colour bright bay, beneath whitish; female duller in colours; smaller.

Inhabits Guinea, Central Africa.

Royal Antelope, Pen. King of the Harts, Bosman. A. Pigmea, Shaw. Cervula Parvula Africana, Seba. Chevrotain de Guineé, Buff.

Neotragus Madoka, (Salt's Antelope.) Animal very small; horns one inch and a quarter long, very slender, recumbent, points slightly turned forward, six or seven semi-annuli at base; ears broad, oval; hair of the forehead very close, short, and fine; no lachrymary sinus; colour of the head pale fulvous; pasterns long; hoofs very long, pointed, horn colour.

Inhabits Abyssinia.

A. Madoka, C. H. Smith *MS.* A. Saltiana, Blainv. Desmar Madoka, *in Abyssinia.*

Sub-genus TRAGELAPHUS.—*Horns in the males only? with ridges forming angles, which turn somewhat spirally, seated high on the frontals, reclining; small or naked spot for a muzzle; no lachrymary opening; colours remarkably diversified with white spots and streaks; form elegant, though receding from the typical structure of true Antelopes, and assuming that of Goats; females with four mammæ.*

Tragelaphus Sylvatica. (The Boschbok.) The adult male about two feet eight inches high, and five feet three inches in length; head seven inches; horns ten inches long, marked with an obsolete ridge in front, and one in rear, horizontal, spiral and sublyrate, black, and closely annulated at base; general colour brilliant chesnut brown above, and marked with a narrow white streak along the spine; several round spots on

the cheek ; shoulder, loins, and thighs, of a pure white, as also the whole of the lower parts ; tail six inches long.

Inhabits the forests of South Africa.

Boschbok, Sparr. *and the Dutch Colonists.* A. Sylvatica, Auctor. Boschbok, Allaman in Buff.

Tragelaphus Scripta. (Harnessed Antelope.) Adult male two feet eight inches high, four feet eight inches long ; horns seven inches long, reclining, straight, wavy, with two ridges twisting spirally round the axis ; general colour bright fulvous bay, two narrow lines passing from the withers obliquely downwards, one to the flank, the other to the groin, intersected at right angles across the back by three others, and four or five similar across the croup ; several round spots about the face and thighs all pure white

Inhabits Central and Western Africa,—about Senegal.

Le Guib, Buff. Adanson? A. Scripta, Pall. and Auctor Harnessed A., Pen. Shaw.

Tragelaphus Phalerata, (Ribbed Antelope.) Male about two feet four inches high, four feet long ; horns three or four inches long, reclining, conical, not conpressed, without ridges or transverse protuberances ; forehead broad ; a small black muzzle ; general colour rufous , a black line edged on each side by one of white, along the spine to the tail ; a second white line from the middle of the shoulder to the groin, between them nine perpendicular lines forming ribs, but not intersecting the inferior ; on the thigh many, and on the cheeks and face several, round spots all of white.

Inhabits Western Africa, about the river Congo ;—is found in the bushy plains.

A. Phalerata, H. Smith. Le Guib, var Desmar. *in note.*

Genus Capra.

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}$, *molars* $\frac{6}{6}$,—32. *Horns common to both sexes, or rarely wanting in the females, in domesticated races, occasionally absent in both ; they are directed upwards, or depressed backwards, more or less angular, nodose ; no muzzle, no lachrymary sinus, nor inguinal pores ; eyes light coloured, pupil elongated ; tail short, flat, and naked at base ; below the chin, bearded. Reside in the primitive and highest mountains of the ancient continent. The domestic varieties are more or less subject to modifications in their general characters.*

Capra Jaela, H. Smith. (Abyssinian Ibex.) Adult male somewhat higher at the shoulder than the Capra Ibex ; horns three feet long, subvertical, forming a semi-circle backwards,

sub-triangular, round in front, with twenty-three irregular prominent knots, extending along the external surface, with several smaller at base, and interposed among the upper, of a dirty horn-colour; beard short; general colour dirty brownish fawn, with a dark streak along the back; long hair under the throat.

Var? the Siberian Ibex, Ibex Apium Sibiricarum *of Pallas*, pale grey and brown, black line on the back and down the front of the legs, black space on the upper arm, and under parts white.

Inhabits the mountains of Abyssinia, Upper Egypt, Mount Sinai, and probably Persia.

Jaela, *Chaldaic.* Jaal, *Arabic.* Akko *of Deuteronomy.*

Genus Ovis.

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}$, *molars* $\frac{6}{6}$,—32. *Horns common to both sexes, sometimes wanting in the females; they are voluminous, more or less angular, transversely wrinkled, pale coloured, turned laterally in spiral directions, first towards the rear, vaginating upon a porous bony axis; the forehead and chaffron arched; they have no lachrymary sinus, no muzzle, nor inguinal pores; no beard properly so called. The females have two mammæ; the tail rather short; ears small; legs slender; hair of two kinds, one harder and close, the other woolly. In a domestic state the wool predominates, the horns vary or disappear, the ears and tail lengthen, and several other characters undergo modifications. The genus is gregarious in the mountains of the four quarters of the globe.*

Ovis Tragelaphus. (Bearded Argali.) Adult male three feet six inches at the shoulder; five feet nine inches from nose to tail; head one foot three inches; horns two feet long, wrinkled, angular, black, thirteen inches and a half in circumference at the base, and turned spirally back and downwards; a large beard from the cheeks and under-jaw, divided into two lobes; neck short, lined with a standing mane; knees covered by long dense hairs bent back; general colour rufous-brown; external hoofs of the fore-feet longer than the internal; six incisor teeth.

Inhabits the mountains of Mauritiania (Morocco.)

Tragelaphus, Caius in Gesner. Fishtall and Lerwee of Shaw.

Var. Size of the common Ram; horns eleven inches in circumference, bending outwards and backwards; no tuft or mane on the shoulders; long tufts of hair round the fore-knees; tail six or seven inches long; general colour pale rufous.

Inhabits the mountains of Upper Egypt.

Mouflon D'Afrique, Geoff. Bearded Sheep, Pen. Ophion, Plin.

Genus Damalis.

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{6}{6}\,\frac{6}{6}$,—32. *Horns common to both sexes, or in the males only, situate upon the frontal crest, variously bent, and the osseous core provided with a basal cavity communicating externally by a sinus passing beneath the horny sheath; the head heavy, long; the neck short; the spinous processes of first vertebræ of the back mostly elevated, and the croup often depressed; the body bulky; the legs stout; the tail pendulous, more or less lengthened; a mane and beard or tuft usual, and the dewlap wholly or partially developed; the stature of the species in general large.*

Sub-genus Acronotus.—*Horns common to both sexes, with double flexures more or less pronounced, approximated at base, annulated below, smooth and turned back at the tips; head narrow, long; muzzle small or none; small lachrymary opening; no tufts on knees; inguinal pores; the shoulders in general much elevated; the croup depressed; tail terminated by a tuft reaching to the houghs; two or four mammæ; not remarkable for speed.*

Acronotus Bubalis. (The Bubalis.) Adult male larger than the Stag; horns about thirteen inches long, robust, black, nearly in contact at base, oblique, grooved, then diverging, bent forwards, and the tips turned back; the eyes high in the head; a distinct lachrymary sinus; the shoulders very high; croup much depressed; hair short, smooth, wholly yellowish-dun.

Inhabits Northern Africa.

Bubalis, Plin. Le Bubale, G. Cuv.

Acronotus Caama. (The Caama.) Adult male five feet high at the withers; shoulder not so elevated as in the former; seven feet six inches from nose to tail; female considerabls less; the head longer; horns placed upon a ridge above the frontals, very close at base, robust, black, diverging, turned forwards and the points backward, five or six prominent knots on the anterior surface, black spot at their base; from the forehead a black streak to the nostrils; the chin a narrow line on the ridge of the neck; streak down the fore-legs, and one on the middle of the thigh, black; general colour of the fur pale fulvous or lively ochre; large triangular spot of white on the buttocks, as also the inferior parts of the body; mammæ two.

Inhabits South Africa.

Hartebeest, Sparrman. Le Caama, G. Cuv.

Acronotus Senegalensis. (The Koba.) Male head fourteen inches and a half long, facial line convex, dark streak down the nose; muzzle broad and black; cheeks paler brown; lachrymary sinus not evident; horns on the summit of frontals above the

plane of occiput, nineteen inches and a half long, five inches and a half from tip to tip, curved inwards and backwards, seven inches in circumference at base, and marked with five or six semi-annuli, and then with sixteen annuli; size equal to a stag; general colour dark rufous, dirty white beneath, and tail with long hair.

Inhabits Central Africa.

A. Senegalensis, Auctor. A. Koba.

Acronotus Lunata, H. Smith. (The Sassayby?) An adult female four feet six inches long, about three feet high at the shoulder, two feet eight inches at the croup; horns robust, on the summit of the frontals turning outwards, and forming two semi-circles with the points inwards, with twelve indistinct annuli; neck short; body bulky; head broad; dark streak down the face; general colour a deep blackish purple-brown above, more fulvous beneath; ears six inches and a half long; small lachrymary sinus; facial line straight; tail middle-sized, covered with long black hair; mammæ?

Inhabits South Africa,—the Booshwana country.

The Sassayby, Daniell. D. Lunata, H. Smith, *MS.*

Sub-genus Boselaphus.—*Horns common to both sexes, heavy, very robust, placed on the summit of the frontals, transversely wrinkled, straight or slightly bent with tips forward, brown or grey in colour, twisted on their own axis, which is in a prolonged direction with the plane of the face, a ridge more or less prominent forming one spiral turn round them; a large sinus in the base of the nucleus, the rest partially porous; a muzzle; no suborbital sinus; mane on the neck; broad and deep dewlap edged with long hair; females an udder of four mammæ; stature very large.*

Boselaphus Oreas. (The Impoofo.) Adult male above five feet high at the shoulder, nine feet long, and weighing eight hundred pounds; forehead square; muzzle broad; facial line straight; horns about two feet long, straight, with a ponderous ridge ascending in a spiral form to near the tips; proportions of the body like a bull, above seven feet in girth behind the arms; neck thick; shoulders very high; larynx very prominent; dewlap fringed with long hair; a crest of bristles from the forehead passing upwards and recurrent along the ridge of the neck; croup depressed; tail two feet long, with a large tuft of coarse hair; hide black; general colour rufous-dun and ashy; females smaller; horns more slender and longer,

Inhabits South Africa, gregarious.

Ant. Oreas, Pallas, *&c.* Coudou, Buff. Caana, Gordon. Eland Gazelle, Sparrm. Impoofo, Poffo *of the Caffres.* Eland *of the Cape Colonists.*

Boselaphus Canna. (The Canna.) Adult male somewhat smaller than the Impoofo, more slender; head shorter; horns without prominent spiral ridge; but obtusely angular in front and feint, twisting this angle into a spiral curve: they are more parallel, very closely wrinkled, and bent back beneath the facial line with the point forward, seventeen inches long in a male, twenty-two inches in a female; narrow dark streak down the forehead; small lachrymary or rather prolonged inner canthus of the eyes, with a dark angular spot beneath; shoulders not much elevated; mane on neck not recurrent; general colour a mixed tone of dark grey brown; sternum white; limbs nearly black.

Inhabits South Africa,—principally beyond the Gareip.

D. Canna, H. Smith, *MS.* Bastard Eland *of the Cape Colonists.* Y'Gaan *of the Hottentots.*

Sub-genus Strepsiceros.—*Horns in the male only, smooth, without wrinkles, pale coloured, with dark tips, forming regular spiral curves, and issuing from the summit of the frontal crest; the nucleus with a cavity at base, and porous above; a broad moist muzzle; real dewlap; long mane on the neck; a beard on the chin; white streak over the eyes; ears broad; shoulder elevated; tail covered with long hairs; females having an udder of four mammæ; stature large.*

Strepsiceros Capensis. (The Koodoo.) Adult male four feet high at the shoulder; above eight feet long; horns bulky, compressed, with an anterior ridge, forming with the horn two complete spiral circles, the tips turned outwards and forward; colour pale, tips dark with a white point, and three feet long; chaffron straight; muzzle very broad; ears oblique, very broad, tips pointed; neck thick; withers elevated; dewlap anteriorly square; forehead black, a white line passing over the orbits, unites on the chaffron; chin white-bearded; long fringe of hair on the dewlap, and on the neck a standing mane; general colour of the fur a buff-grey, marked with a white line along the spine; and intersected by four or five others running downwards towards the belly, and four more across the croup; buttocks white; colour beneath rufous; tail white above, edged with rufous and black at the end; female hornless, and with fewer and fainter white markings.

Inhabits South Africa.

Strepsiceros, Caius apud Gesn. Gondoma, Coesdoes, Buff. Coudou, Vosmaer. A. Strepsiceros, Auctor. Striped Ant. Penn.

Tribe BOVIDÆ.

Horns persistent, common to both sexes, vaginating upon a bony nucleus, not solid but more or less porous and cellular; the horny sheath increasing by ringlets at the base; the horns round, without annuli, striæ, or ridges; invariably placed upon or at the sides of the frontals, never straight, but at first always bending outwards or forwards; a broad muzzle, almost always naked; no lachrymary sinus; neck short; breast and shoulder deep, more or less dewlapped; structure powerful; vertebræ of the tail often prolonged below the hough; no inguinal pores; females always bearing an udder; stature large; manners gregarious.

Genus Catoblepas.

Incisors $\frac{0}{8}$, *canines* $\frac{0}{0}$, *molars* $\frac{6}{6}$,—32. *Head square, horns flat and broad at base, nearly joining on the crest of the frontals; lying outwards, turning down with the points uncinating upwards; muzzle broad; nostrils as in the Ox, but provided internally with a moveable valve; glandulous excrescence on the cheeks; a mane on the neck; considerable beard beneath the throat; a small dewlap; bristles round the orbits and on the lips; ridge of hair on the chaffron; carcass round; tail hairy, as in the horse; legs clean and firm: gregarious.*

Catoblepas Gnu. (The Gnoo.) Adult male three feet ten inches high at the shoulder, five feet six inches long; head square; shoulder deep; body round; a pillow of fat on the haunches; legs long and clean; horns dark, broad upon the summit of the head, tapering out sideways over the eyes, and turning up into a pointed hook; black bristly hair upon the face; a tuft of similar hair beneath each eye, concealing a gland; the ears are short; white bristles surround the eye, and spread on the cheeks: a vertical mane on the neck, black in the centre, white at the sides; a bushy beard on the under jaw, and dark-brown fringe along throat, down to between the fore-legs; tail lined with long white hair; general colour of the fur deep brown; hoofs pointed, blue-black; females smaller; base of horns less approximated, covered with coarse hair.

Inhabits the Plains of South Africa.

Antelope Gnu, Auctor. The Gnu *of English.* A. Niou *of French Authors.* Gnoo *of the Hottentots.* Wilde Beest *of the Cape Colonists.*

(To be continued.)

SOUTH AFRICAN
QUARTERLY JOURNAL,
SECOND SERIES.

No. 3. APRIL—JUNE, 1834. Part 2.

A Sketch of the Progress and present State of Geographical Discovery in the African Continent, made from the Colony of the Cape of Good Hope.—By J. C. Chase.

[Continued from page 206, and concluded.]

Delagoa Bay, the most southern possession of the Portuguese Government on the eastern side of Africa, as fixed by the treaty of the year 1825, is too well known to require particular description here. It has been occupied by several nations at different times, but without success; and its only pertinacious masters, the Portuguese, hold, it is evident, a very insecure tenure of the place, being frequently obliged to shut themselves up in their miserable and ruinous Fort, as a protection against the warlike savages irritated by constant ill-treatment; so late as the year 1824, a party, with the Governor, 50 disciplined soldiers, and 300 men, were cut off by a popular Chief.

The natives of Delagoa Bay are called by the Zulos Amacluangas, from whom, in language and manners, they materially differ; but from Delagoa Bay to Sofala the people appear to be of one common stock.

The country south of the Mapoota, called Inyack, is under the authority of a powerful native Chief named Macassanie, who, assisted and instigated by the Portuguese, keep up a constant warfare with his neighbours of Tembe, situated on the north of the same stream. The King of this district was Myetta, who, in consequence of the insults and oppressions of the Portuguese, and the inroads of Macassanie's warriors, ceded his dominions to Great Britain, in the hopes of protection, in March 1823, while H. M. Ship the *Leven* was in the Bay; this act proved fatal to himself and countrymen, for as soon as Commodore Owen, commanding that vessel, had left he was again attacked, himself and many of his people, put to death, and almost all the remainder sold into slavery, at the instigation of the Portugueze ——— at the fort.

The country from the Pongola to the English River, on the northern shore of which is situated the Portuguese Fort, is low, sandy, and full of swamps; is covered with a stunted description of bush; and although the atmosphere is healthy for several months in the year, from the latter end of October to April it is most deadly; the limits of this sickly region westward, appears to be marked by a range of mountains of no very considerable height, called Bombo, which, originating in the Ingale, skirt the Pongola River, and run down nearly to the sea in a south-easterly direction, bounding the great valley of the Mapoota and Gold Downs' River from the salubrious country on the south. Throughout this whole range, as has been already remarked, water is less plentiful than in the preceding divisions, and is generally sought for in ponds, or wells dug for the purpose. Some very beautiful lakes have been discovered on both sides of the Mapoota, and there is one said to exist near its mouth, of very great extent, and which, very probably, empties itself into Port Melville, a good harbour on the southern side of Delagoa Bay.

From what has preceded, it will be seen that the progress of Discovery from the Cape of Good Hope, has extended to a very considerable depth into the continent, beyond the colony, and that, especially of late years, it has accelerated its pace in a very extraordinary degree, mainly attributable to trading speculation. With reference to the map, its limits may be defined in a general manner by drawing a line from Angra Pequena Bay, on the Atlantic coast, direct north, to lat. 25°, along that parallel to longitude 19°, thence southward to lat. 28°, from that point eastward to 22°, and thence in a diagonal to where the 26th degree of longitude intersects the tropic of Capricorn; starting again along the tropical parallel to longitude 31°, if the reader will please to protract a line southerly to the mouth of the English River in Delagoa Bay, he will then have traced out the extensive boundary of all the discoveries that have yet been made from the most austral Settlement of Africa.

Within this verge, however, a space containing about 50,000 square miles still appears unexplored; this embosoms three large sources of the Gariep or Orange River, namely, the Caledon and Stockenstrom Rivers on the south, and the Donkin on the north, and may be represented as an oval figure having its centre about lat. 28°. 30′. and long. 25° 20′, the longest arm of which, stretching from south-west to north east, will extend over 240 miles, and the shorter, running from south to north, over 200 miles. This insulated spot has however been several times encroached upon by the colonial farmers, and especially by one, named Gert Cloete, of the Graaff-Reinet district,

who represents it as very beautiful, abounding with game, well wooded, sufficiently watered, and covered with the *remains* of the labours of a superior race of natives, who had been accustomed to fortify the approaches to their town by closing up the gorges of their ravines by ramparts constructed of stone.

Beyond the line just alluded to as marking the limits of penetration into the interior, from the colony of the Cape of Good Hope to the boundaries of Portugueze discovery, a huge blank stretches itself quite across the Continent, utterly unknown to Commerce, to Science, to Philanthropy, and to Religion. Native testimony has peopled these regions with monsters, and with men worse than monsters, for it appears to be the object of all savage communities to villify their neighbours; it represents it as thickly populated, containing numerous large towns, extensive collections of inland waters, either mediterranean seas or great lakes, and considerable forests. It is to this part of the Continent that the Expedition about to leave the Colony is to direct its researches, and a more interesting field of inquiry can hardly be imagined or elsewhere exist in this globe of ours, which is so rapidly yielding up its last store of hidden treasures to the curiosity of man. The genius of Geography, like the Macedonian hero, surveying his noble acquirements, will soon have to weep over them, regretting that she too has no other worlds to conquer.

This enormous tract of TERRA INCOGNITA, this sequestered range, this unenlightened spot is, after all, an insulated division of the Continent. It has its defined boundary, and there is every reason to believe from the Portuguese archives published by the late and lamented Mr. BOWDICH, a nearly continuous one from the Eastern to the Western Oceans. The limits enclosing it on the south, that is, separating it from the countries now traversed by the traders from the Cape of Good Hope, have been already traced. Its northern boundary may be expressed by lines drawn from where the latitudinal and longitudinal points of 35° and 20° intersect in Sofala Bay, thence eastward to a similar intersection in 27° and 19°, thence north to latitude 15°, again west to latitude 13°, longitude 20°, from that point south-east to long. 15°, lat. 19°, and thence to Fish Bay upon the Atlantic shores, in lat. 16° 30′ and longitude 13°.

The vast territory overhanging this line of demarkation, is claimed by the Portugueze, and it is upon the entrance of this alone that any serious difficulty or danger to exploratory adventurers may be anticipated. Portugueze jealousy and treachery are proverbial, and both of these vices it is too well known have a luxuriant growth under the southern hemisphere, these would no doubt be called into full excitation by the ap-

pearance of a party of travellers from a British Settlement within the pale of their trade and influence, but as the nearest point of their penetration to the south is distant more than four degrees from the tropic, there is but little chance of the present Expedition incurring the hazard of collision with a Portugueze outpost, more especially if its Conductor, Dr. Smith, follow up the plan entertained by the Committee of Management, of making distance an object of subordinate importance to a full and connected survey of the countries through which it may pass.

Although it was not contemplated to say any thing regarding these countries, when the reading of the present paper was commenced, and is not quite within its scope, still as the connection of the lines of discovery from the Cape with those of the Portugueze is an object of importance, and must be the aim of future adventurers, I shall in this place add by way of conclusion, a few notices from Salt's excellent work on Abyssinia, and Bowdich's account of the discoveries of the Portuguze in the interior of Angola and Mozambique.

The territory just indicated as belonging to the Portugueze or rather that to which they lay (a very shadowy) claim, consists of the vallies of the Congo, Coanza, and Cunene, on the West, and that of the Zambezi River in the Colony of Mozambique, on the East, with their respective and wide spreading tributary streams. Discovery made from time to time by Europeans and Natives from both these remote settlements into the interior, has, it is believed, connected them, and we have almost indubitable evidence that an overland communication has been established from one to the other.

The Western Colonies extend inland from the coast to very unequal distances, that of Congo 300 miles, Angola to 700, and Bengula 200. The force kept up at the latter place consists of 100 infantry and 50 artillery, together with troops of the line. Each of the forts, of Encoche on the river Onzo, Massangano on a branch of the Coanza, and Caconda, (the last the most healthy, and farthest south, situated in latitude 14° 35′ and 17 degrees each) has 100 infantry; and the other forts, of which there are many, have each 60, "all recruited among the natives," commanded by Portugueze officers of the line. Besides these regular troops, a militia of the inhabitants of the neighbourhood, armed by the Government and officered by Portugueze residents, is kept up at each establishment, "both in the interior and on the coast,"—"with this militia, which amounts to several thousands, conducted by officers of the line, and other contingencies of native force which the different states are bound to furnish, the Government carries on whatever wars it may be involved in against the Cassanges and other

nations, who frequently bring into the hostile field armies of eighteen thousand men."

"The Commercial Establishments, called Fairs or Feiras, two of which are 700 miles within land, are under the superintendence of the Portugueze Resident, who is stationed there for the purpose of keeping up a continual correspondence with the Governor General, and to prevent his countrymen, who frequent these markets periodically, from abusing the confidence of the Natives, or offending them by any other injury."

The first attempt to open a direct communication with Mozambique "was made during the Government of Count Saldanah. M. da Costa, a respectable Portugueze merchant, who formerly commanded the militia in the interior, having retired from some disgust, went and established himself as a trader in Cassange, where he lived many years in perfect harmony with the natives. To this gentleman, Count Saldanha, soon after his arrival at the seat of government in 1807, applied for information respecting the practicability of employing an expedition on a route of discovery.

"After receiving several communications, favourable to the object he had in view, the Count authorised M. da Costa to send a Portugueze mulatto, stationed at one of the fairs in Cassange, accompanied by native guides and interpreters, to penetrate, if possible to Mooloaa, a country hitherto unknown to Europeans, except by the report of its populousness and power. The mulatto, after a journey of two months, from the southernmost fair in Cassange, reached the capital of Mooloaa,* where he met with a liberal reception from the monarch, Muata Janvo. This Mutua, for that it seems is the titular name, lives at a considerable distance from his wife, who governs another state, perfectly independent of her husband, with whom she only resides on particular days of the year. The town of the Mooloaas is laid out in streets, which are watered daily, and there are held in it regular markets. A horrid practice, of sacrificing from fifteen to twenty negroes every day, prevails both at the court of the Muata and that of his wife. Their neighbours, on the south-east, pay them tribute in marine salt; and they described another country as dependent on them, to which a Portugeuze officer had recently penetrated from the eastern coast, and died there. This person was M. Lacerda, colonel of Engineers.

"The king of the Mooloóas would not suffer the Portugueze envoy to pass through his territories, for the eastern coast, until an understanding had been settled between himself and the governor-general Count Saldanha, to whom accordingly two

* Situated about lat. 11° 30'. long. 32° 20'.

formal and distinct embassies were sent, one from the Muata and the other from his wife, bearing separate presents. These Africans were clothed for the most part in European manufactures, obtained from the Portugueze settlement in Mozambique; and Count Saldanha remarked that they were not only a much finer race of men than those in the vicinity of the coast, but that they were also more civilized and intelligent."—" As they requested that a Portugueze mart or fair might be established in Moolooa, similar to those in Cassange, Count Saldanha was encouraged to send another expedition with orders to proceed to Mozambique, there to embark, and return by sea to Loanda. Unfortunately, however, this enlightened and enterprising governor being soon afterwards recalled, and sent on an embassy to Russia, the project from which so much benefit might have resulted, fell to the ground through the negligence of the Count's successor, and the opposition of the Cassanges to the proposed commercial intercourse with the Moolooas."

Colonel Lacerda, who has been mentioned in the preceding extract, as having arrived on the borders of the territories of the Mutua Janvo, was ordered by the Mozambique government to penetrate inland from Tête, a considerable factory on the river Zambezi, where he died; a copy of his last dispatch, which was placed in Mr. Bowdich's hands, is dated at Tete in March 1798, from which place he was to proceed with six officers and fifty soldiers; from this expedition he never returned. His dispatch, however, contained much valuable information,—inclosed was the deposition of Gonsalvo Gaetano Perreira, who had penetrated to the capital of the Cazembe, which is situated more than half the distance to Benguela, where immediately on his arrival " a messenger was dispatched to the king of Mooropooa, informing him that if he had seen white men from Angola, the Cazembe had received a visit of the like kind from Mozambique."

An ambassador from the Cazembe visited Col. Lacerda at Tete, who furnished him with a route more southerly and direct than that pursued by Perreira, and stated, that from the capital of his sovereign to that of Mooropooa, (from which a constant communication is kept up with Benguela and the coast, canoes coming from Angola to within a short distance of it,) was a journey of two months. Mooropooa is about 200 miles distant from St. Philip de Benguela, direct east.

It will thus appear that two lines of communication have been opened between the eastern and western colonies of Portugal. In 1807, that from Benguela through the fair at Cassange to the capital of the Mutua Janvo, who trades with Mozambique; and that by Perreira previous to 1798, from the latter place to the Cazembe, who maintains intercourse with Mooropooa,

the latter place supplying Angola and the west coast with slaves and native produce.

The eastern settlements on the Zambezi or Cuama river, with their fairs, extend to above 700 miles from the coast, and although much fallen off from their antient splendor and extensive trade, are still important. SENA and TETE, which are built upon the river, are the head-quarters, commanding certain trading districts; besides which, is ZUMBO, where the Portugueze are allowed a small factory by the natives.

Senà is a considerable town on the southern bank of the Zambezi, 267 miles above Quilimanci on the coast, and is the principal establishment, it contains about 2000 inhabitants, and, according to Bowdich, possesses a garrison of forty-nine men. It is protected by a strong fort, and is commanded by an officer subordinate to Mozambique, but superior over all the other settlements on the river.

The chief mart for gold in the interior, is in Manica, twenty days journey south-west from Senà. Two fairs are held here for the convenience of trade, where the merchants of Sofala and Senà carry on their traffic; the site of one of these is placed by Bowdich in about lat. 19° and long. 31° 30′, where is a force kept up of twelve men. This is the most southerly establishment of the Portugueze upon the frontier of the Zambezi colony, and not above 450 miles from Kurrechane, that is about one-third of the distance between Kurrechane and Cape Town. The first part of the journey from Senà to the Manica fair lies through a country under the influence of the Portugueze, and the remaining part of it comprises districts in the hands of native tribes, which the traders are obliged to conciliate by frequent presents: a tribute also still continues to be paid to the Quitéve, or King, for his permission to carry on the trade, for which purpose an annual deputation is sent from Senà to his capital. ZIMBAO, situated about two days journey from the frontiers of Manica, on a great river rising in that territory, this stream is navigable, and Zimbao is reported to be about fifteen days journey from Sofala Bay.

"The country around Manica is extremely fertile, and yields abundance of provisions and cattle. It is very mountainous, and supposed to lie at a great elevation above the sea, the weather at times being unusually cold for the latitude in which it is situated. Frequent storms of thunder and lightning occur, which are attributed by the Portugueze to the immense quantities of metallic substances with which the country abounds. The trade is here carried on by barter, and the goods most valued are Surat cloths, beads, coarse silks, and iron; and the returns, besides gold, consist of ivory, ghee, and a small quantity of copper."

Manica is principally watered by a branch of the Zambezi, the Manzora or Arvanha river, which has several tributaries, the most westerly of which, the Mocaras, rises in Mount FURA, lying somewhere between lat. 18° & 19°, and longitude 30°. This great mountain is said to be so abundant in the precious metal that some have affirmed it to be the antient Ophir of Solomon. Be that as it may, it is evident from the hewn stones found upon it, which tradition declares to have been formerly piled upon each other with great art, that it was at some remote period frequented and tenanted by tribes more powerful and skilful than the present inhabitants. The river which flows from it carries down in its course, sand mixed with gold.

Tête is about sixty leagues farther up the river, and about half way between it and Senà is the pass of LUPATA, where the stream is so contracted that a child may throw a stone across. The garrison consist of ninety four regulars. Fifty leagues south-west of Tête are the ruins of Dambarari, the former site of a fair, and once a large and flourishing town, where is still standing the steeple of the church and even the clock in it.

A month's journey from Tête brings the trader to the Zumbo fair. From Tête down the river to the sea is a continuous navigation, but from the former place to Zumbo the first fifteen days has to be performed overland (in consequence of great falls in the river) to CHICOVA, the reputed seat of large and rich silver mines, and thence in small boats to the trading station from which the adventurers send out their agents in different directions, who, in return for Surat cloths, beads, coarse silks and iron, bring back gold, ivory, and other valuable articles.

From information procured by Bowdich, the Zumbo fair is held in about lat. 17° 30′ and longitude 27° 30′, nearly 500 miles direct north of Kurrechane, a point which is now frequently visited by the traders from the Cape colony. It is surrounded by forests, and is a place of great resort, and a force of thirty-seven regulars is said to be maintained there by the Portugueze. To it is brought not only the principal part of the gold of the rich mines of ABUTUA, (through which country the great river CUNENE is supposed to run,) one hundred and twenty leagues distant to the westward, but also that from the mines of Pemba and Murusura, "*and what seems more extra ordinary, considerable quantities of ivory from the Orange River.*" In this part of the interior the climate is mild and salubrious, but the resident Portugueze mulattos are represented to be very unprincipled. There are copper and iron mines near Zumbo; also beds of coal, various kinds of chrystals, and an abundance of excellent timber.

JOHN CENTLIVRES CHASE.

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 224.

Catoblepas Taurina. (The Kokoon.) Adult male nearly four feet six inches high at the shoulder; much lower at the croup, and five feet from the breast to the rump; head, neck, and shoulder, excessively thick and strong; head shorter and broader in proportion; eyes very high in the head; horns less broad at base, marked with irregular rugosities at the roots, more distant at base; black, bent down sideways behind the ears, and then suddenly turned upwards, but not to the front; forehead high between their bases; head one foot ten inches long; ears ten inches; tail three feet three inches, covered with long black hair; neck with a long flowing dark mane, reaching beyond the withers; a cartilaginous protuberance covering the chaffron, and furnished with long black hair; large circular glandulous naked spot, distilling a viscous humour beneath each eye; chin covered with dark bristly beard, descending down the dewlap to the breast; general colour dark ashy-grey.

Cocong, Lichtenstein's *Travels.* A. Taurina, Burchell. Kokoon, Somerville and Daniell.

Inhabits South Africa.

Catoblepas Gorgon. (The Brindled Gnoo.) Adult male? larger than the Gnoo; horns placed close together, white, round, standing up, bent outwards, and the points turned towards each other, and black; forehead and chaffron covered with irregular depressions; nose and mouth flat and square; ears short; long flowing mane on neck, extending beyond the withers; no beard on the under jaw; long black hairs on the throat and dewlap; tail black, but shorter than in the former; general colour dirty-dun and sepia-grey, variegated with obscure streaks or brindles; four or five cross streaks on the upper arm.

Inhabits the Interior of South Africa.

Bastard Wilde Beest *of the Cape Colonists.*

Genus Bos.

Skull very strong, dense about the frontals, which are convex, nearly flat or concave; horns invariably occupying the crest, projecting at first laterally; osseous nucleus throughout porous, even cellular; muzzle invariably broad, naked, moist, black; ears in general middle-sized; body long; legs solid; stature large.

Sub-genus BUBALUS.—*Animals low in proportion to their bulk; limbs very solid; head large; forehead narrow, very strong, convex; chaffron straight; muzzle square; horns lying flat or bending laterally with a certain direction to the rear; eyes large; ears mostly funnel-shaped; no hunch; a small dewlap; female, udder with four mammæ; tail long, slender.*

Bubalus Caffer. (The Cape Buffalo.) Adult male about five feet six inches at the shoulder, nine feet from nose to root of tail; horns spreading horizontally on the head, in contact at base, eight or ten inches broad, very ponderous, dark coloured, and above five feet from tip to tip, the internal nucleus very cellular, the points turned up; the incisor teeth loose; ears wide, rather hanging; under-jaw bearded; back straight; hide black, almost naked, and the end of tail furnished with a few distichous bristles; in the young much black longish hair, particularly about the ridge of the back.

Inhabits South Africa.

B. Caffer, Sparrm. et Auctor. Cape Ox, Penn. Qu'araho *of the Hottentots.* Zamouse? *in Bornou.*

Bubalus Pegasus? (The Pagasse.) A young male, the horns lying across the summit of the head, the tips turned up; colour darkish, with obscure transverse ridges; head very short, thick, abrupt at the nose; forehead wide; eyes large and full; the neck with a dense mane; ears long, flaccid, pendulous; tail to below the houghs covered with long woolly black hair, general colour deep brown; feet white.

Inhabits Congo, Angola, Central Africa.

Pacasse, Gallini and Carli. Empaguessa, Merolla. Empacasse, Lopez, Marmol. Pegasus, Pliny. Wadan? Captain Lyon's *Travels.* B. Pegasus, H. Smith, *MS.*

ORDER CETACEA.

BODY pisciform, terminated by a caudal appendage, cartilaginous, and horizontal; two anterior extremities formed like fins, having the bones which form them flattened and very short; head joined to the body by a very short thick neck; two pectoral or abdominal mammæ; ears with very small external openings; brain large; pelvis and bones of the posterior extremities represented by two rudimentary bones lost in the flesh.

FAM. SIRENIA.

Molars with flat coronal; sometimes tusks in the upper jaw; two pectoral mammæ; mustaches; nostrils, properly so called, placed at the end of the muzzle; nasal apertures on the upper part of the head; body very massive. Food, vegetable.

Genus Manatus. *Linnæus.*

Incisors $\frac{2}{0}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{8}{8}\,\frac{8}{8}$,—38. *The incisors exist only in the fœtus, and the adults have but* 32 *teeth, four of the molars falling out in early age; molars with two transverse cushions on their crown; head not distinct from the body; eyes very small; tongue oval; vestiges of nails on the margin of the pectoral fins; six cervical vertebræ; sixteen pairs of thick ribs; mustaches composed of a bundle of very strong hairs directed downwards, and forming on each side a kind of corneous tusk.*

Manatus Senegalensis, Desm. (Senegal Lamintin.) General colour ashy-lilac; head bony, short in proportion to its breadth; breadth of nasal foramina three-fourths of their length; inferior margin of lower jaw curved; smaller than the American Lamantin. About eight feet long.

Inhabits the mouth of the Senegal.

Trichecus Australis, Shaw. Lamantin du Senegal, Adanson, *Voyage.*

Genus Halicore. *Cuvier.*

Incisors $\frac{2}{0}$, *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{3}{3}\,\frac{3}{3}$,—14. *In early age, incisors* $\frac{4}{0}$. *canines* $\frac{0}{0}\,\frac{0}{0}$, *molars* $\frac{5}{5}\,\frac{5}{5}$,—32. *Two of the upper incisors cylindrical and straight, forming tusks; molars cylindrical, and only three on each side in the adults; body pisciform, terminated by a horizontal fin with two lobes; head not distinct from the body; muzzle truncated and moveable, with thick spiny hairs on the edges of the lips; tongue soft; fins short, without distinct fingers or nails; seven cervical vertebræ; eighteen pairs of ribs.*

Halicore Indicus, Desm. Head rounded towards the top, oblique from the forehead to the muzzle, which last is vertical and terminates abruptly. This part of the face is formed by the upper lip, which hangs from each side of the mouth forming these two mobile and fleshy pendants which cover a part of the lower jaw laterally. These are set with small corneous spines about an inch long; between these is a slope in front of the upper jaw which receives the extremity of the lower, above which the points of the tusks are perceptible on each side. The interior of these lips is furnished with corneous warts. The nostrils form two parabolic clifts approximating at the upper extremity of the muzzle; the opening of the ear is very small, and there is no external conch; the eyes are simple and small; the fins show no vestiges of nails, but have warty callosities underneath at their external edge; the tail is horizontally sloped or cut like the arch of a circle; the body is wider at the middle than the extremities, and the part towards the tail is

more slender than the opposite end; the skin is smooth and has some scattered hairs. Seven or eight feet long.

Inhabits the Indian Seas and the Mozambique Channel.

Dugong, Buff. Indian Walrus, Penn. Trichecus Dugong, Gmel. Rosmarus Indicus, Camper, Raffles, Home, F. Cuvier.

Fam. DELPHINIDÆ.

Teeth pointed or obtuse, all of one kind, upon the borders of the jaws; two anal mammæ; spiracles on the top of the head, with their external opening simple; tail flattened horizontally and bifurcated. Food, animal.

Sub-genus Delphinorhyncus, Blainville.—*Snout prolonged, with a long and slender beak; jaws almost linear, with numerous teeth on their margins.*

Delphinorhynchus Capensis. Body long and rather slender; head somewhat conical and terminated before, by a long distinct somewhat flattened snout; hinder part of body near tail strongly carinated both above and below. Colour above a deep shining black, sides a dull dusky white, each obliquely cut by a narrow well-defined blackish streak, which commences immediately behind the eye and terminates or rather loses itself on the belly about two feet in front of the tail; under-parts white. Between the angle of the mouth and base of pectoral fin a dusky streak, and between that and the black band already mentioned the colour is a dusky white. Teeth slender, conical, and slightly curved inwards, about sixty-six in the upper jaw and about ninety in the lower; eyes situated a little higher than the angles of the mouth and about an inch and a half behind them; opening of the spiracles directly over the eyes; dorsal fin slightly falcated, and a little bent backward; pectoral fins narrow and falcated; caudal fin somewhat semilunar with a deep notch behind at the termination of the back-bone. Length from tip of nose to extremity of tail six feet; length from tip of snout to anterior edge of dorsal fin two feet ten inches; height of dorsal fin six inches and a half; width of hinder edge of caudal fin fifteen inches and a half.

Inhabits the seas about the Cape of Good Hope,—generally solitary.

Delphinus Capensis, Gray. *Spicilegia Zoologica, part* i. *p.* 2.

Sub-genus Delphinus, Blainville.—*Head globular or subconical, terminated by a beak distinct from the profile of the face, broad at its base, smaller and rounded at its extremity.*

Delphinus Delphis, Linnæus. Head terminated in front by a long flat snout; the upper and under jaws of equal length, each with about forty-seven pointed teeth, and when the mouth is closed those of the one jaw are included between those of the other; the opening of the spiracles situated nearly above the eyes. The skin is very smooth and shining, the colour in some individuals is a livid brown, in others it is black, on the back, and pearly grey clouded with black on the sides and belly or the belly is entirely white. Tail divided into two large lobes, slightly notched in the middle, and its breadth from one point to the other is generally equal to about two ninths of the entire length of the animal, which averages between seven and nine feet. Period of gestation ten months, and the female seldom produces more than one at a birth.

Inhabits most seas—and amongst others those on the West Coast of Africa.

Delphinus Heavisidii. Gray. Head subconical, and terminated in front by a short tapering, somewhat cylindrical, snout; body thick in proportion to its length, black, variegated beneath with white; the marking of the latter colour consist of a narrow transverse band in front of, and a somewhat triangular spot behind, each of the pectoral fins, and of a longitudinal line on the belly which divides beneath the dorsal fin into three forks, the central one of which is continued in a direct line, and the lateral ones extended obliquely up the sides. Dorsal fin triangular, and about five inches in height; tail semilunar behind and notched in the middle. Length from nose to hinder edge of tail five feet; length from point of snout to anterior edge of dorsal fin two feet three inches; breadth of dorsal fin eight inches and a quarter; length from hinder edge of dorsal fin to tail fin one foot six inches; width of hinder edge of caudal fin fourteen inches.

Inhabits the seas about the Cape of Good Hope,—gregarious.

Delphinus tridens, Smith, *MS.*

Delphinus obscurus, Gray. Colour of back a clear shining black, sides of head and body clouded black and white; belly white; on each side an indistinct dusky stripe, commencing below the dorsal fin, descending obliquely and ending in the posterior and under part of the body; anterior portion of lower jaw and under surface in front of tail dusky black, and a similarly coloured ring surrounds each eye; snout short, rounded, and not very distinct from the anterior portion of the head; teeth slightly curved, the convexities outwards, in the upper jaw about forty on each side, and in the lower about thirty-six; pectoral fins long, pointed, and falci-

form; dorsal fin rather nearer the tail than the head, large, high, pointed and falcated. Length about six feet.

Inhabits the seas about the Cape of Good Hope.

Delphinus Homeii, Smith. *Zoological Journal, vol.* iv. *p.* 441. Tonine *of the Cape Colonists.*

Sub-genus GRAMPUS, Gray.—*Head globular or sub-conical, terminated by a snout not distinguishable from the profile of the face; teeth conical and slightly curved inwards.*

Grampus Gladiator, Lacepede. Head convex above, slightly tapering to the anterior extremity, which has no distinct snout: upper jaw rather longest; teeth eleven on each side of both jaws, strong, conical, and slightly curved inwards; eyes placed a little above and behind angles of mouth; opening of spiracles over the eyes; body very thick about the dorsal fin, from whence it gradually tapering towards the caudal fin; lower parts as far as anus white, the hinder portion of the white three-forked, the centre fork shortest, the lateral ones longest and extend, one on each side, obliquely upwards and backwards; behind and rather above the level of the eye a longitudinal waved white stripe, pointed at both extremities; all the other parts of the animal deep shining black. Dorsal fin situated much nearer the head than the tail, about three feet ten inches high, very strong, triangular, straight, and tapering nearly to a point; pectoral fins short and broad; caudal fin two-lobed with a slight notch behind opposite vertebral column, inner and hinder edges of each lobe convex, outer edges towards points concave. Length from nose to hinder edge of tail nineteen feet.

Inhabits the seas about the Cape of Good Hope.

Killer of the Whale Fishers.

Sub-genus PHOCÆNA, Cuvier.—*No beak, snout short and gibbous.*

Phocæna globiceps, Cuvier. Head rounded above and terminated in front by a very short pointed and scarcely distinct snout; figure slender in proportion to its length; colour entirely black, rather lightest beneath; dorsal fin low, slanting backward, falcated behind, and placed nearer the tail than the head; hinder part of body strongly and sharply carinated above, slightly below; tail fin slightly crescent-shaped and faintly notched opposite termination of vertebral column; pectoral fins long, narrow, and pointed; eyes situated immediately above the angles of the mouth. Length from tip of snout to hinder edge of caudal fin five feet and a half; from tip of snout to anterior edge of dorsal fin twenty-three inches; from posterior

edge of dorsal fin to hinder edge of tail fin thirty-three inches. Height of dorsal fin four inches and a quarter; length of pectoral fins ten inches and a half; distance from point to point of caudal fin thirteen inches; length from tip of snout to angle of mouth seven inches and three quarters.

Inhabits the seas on the South-east coast of Africa.

Obs. I am unable to state the number of the teeth as the specimen I possess is young.

Phocæna Edwardii, Smith. Head large and clumsy, rounded on the upper surface and terminated in front by a short pointed snout; teeth twelve in each jaw; eyes situated a little above the angles of the mouth; dorsal fin long, pointed, slightly curved backwards, and situated nearly midway between head and tail; pectoral fins narrow and pointed, caudal fin deeply and widely notched opposite termination of vertebral column. Colour of back, sides, throat, and under parts of body towards tail, black; breast and belly white. Length from tip of snout to hinder edge of tail fin twelve feet two inches; circumference immediately in front of dorsal fin six feet nine inches; tail fin measured from point to point two feet eight inches.

Inhabits the seas about the Cape of Good Hope.

For the description and a drawing of this species I am indebted to Mr. E. Verreaux, who some time ago had a good opportunity of examining a specimen which had been cast on the shore near Slang-Kop.

Fam. PHYSETERIDÆ.

Upper jaw wide and elevated, without teeth, or only with rudimentary ones; lower jaw elongated, narrow, and corresponding to a furrow of the upper one, teeth on each side; spiracles opening externally by a single orifice, which is situated at or near the upper end of the muzzle; dorsal fins in some; simple eminences in others. Large cavities with cartilagenous walls in the upper region of the head communicating with diverse parts of the body by particular canals filled with an oil which chrystallizes when cool.

Genus Catodon. *Lacepede.*

Orifice of spiracles at the very end of the upper part of the muzzle; a hunch instead of a dorsal fin.

Catodon macrocephalus, Lacepede. (Spermaceti Whale.) Head truncated in front, and of a somewhat cubical form, from twenty to thirty teeth in the lower jaw, which are strong conical, slightly curved inwards, and white like ivory; eyes blackish, surrounded by strong black hair, and are situated in an eminence behind and above the angles of the mouth; auditory

opening with difficulty distinguishable; nape marked by a slight depression which is traceable on each side as far as the pectoral fins; belly large and round; tail notched behind, and measures from point to point about fifteen feet; on the back towards last third of body there is a longitudinal callosity in the form of a fin, which is abrupt or truncated behind. Skin very soft, colour commonly blackish with greenish reflections intermixed with shades of grey, sometimes the colour is slaty blue spotted with white, and the belly is always white. The general length of the animal is from sixty to seventy feet, and the circumference at the thickest part about fifty feet.

Inhabits most seas,—occurs in the Mozambique Channel and near the South-east Coast of Africa.

Fam. BALAENIDÆ.

Teeth none; upper jaw furnished on each side with whalebones or transverse slender corneous laminæ, which are attenuated and fringed at the inner edges; orifices of the spiracles separate, and situated towards the middle of the upper portion of head.

Genus Balæna. *Linnæus.*

No dorsal fin; back regular, or with a hunch.

Balæna mysticetus, Linnæus. Figure cylindrical from the neck to within ten feet of the tail, beyond which it is somewhat quadrangular, the greatest ridge being upward, or on the back, and running backward nearly across the middle of the tail. Head somewhat of a triangular shape; the under part, the arched outline of which is given by the jaw-bones, is flat, and measures 16 to 20 feet in length, and 10 to 12 in breadth; the lips extending 15 to 20 feet in length and 5 or 6 in height, and forming the cavity of the mouth, are attached to the under jaw, and arise from the jaw-bones at an angle of about 80 degrees, having the appearance, when viewed in front, of the letter U. The upper jaw, including the crown bone, or skull, is bent down at the extremity, and is overlapped by the lips in a squamous manner at the sides. In the place of teeth there are two extensive rows of fins, or whalebone, suspended from the sides of the crown bone, they are covered immediately by the lips, and inclose the tongue between their lower extremities. Each series consist of about 300 laminæ, the longest are near the middle from whence they gradually diminish again to nothing at each extremity: 10 or 11 feet is the average length, and the greatest breadth, which is at the gum, is 10 or 12 inches. The laminæ comprising the series are ranged side by side, two-

thirds of an inch apart. The interior edges are covered with a fringe of hair, and the exterior edge of every blade, excepting a few at each extremity of the series, is curved and flattened down, so as to present a smooth surface to the lips. The colour of the whalebone is brownish black or bluish black; in some it is striped longitudinally with white. The eyes about a foot obliquely above and behind the angles of the mouth, small in proportion to the size of the animal. A slight beard, consisting of a few short scattered white hairs, on the anterior extremity of both jaws. Spiracles or blow holes, about 16 feet behind the anterior extremity of the jaw, each 6 or 8 inches long. Pectoral fins placed between two-thirds and two-fifths of the length of the animal from the snout, and about 2 feet behind the angle of the mouth: they are from 7 to 9 feet in length, and from 4 to 5 in breadth; the part by which they are attached to the body is somewhat elliptical, and about 2 feet in diameter; the side which strikes the water is nearly flat; tail flat and circular, indented in the middle, the two lobes somewhat pointed and turned a little backward, its length 5 or 6 feet, its width 18 to 24 or 26 feet. The colour is velvety black, grey, (composed of dots of blackish brown on a white ground,) and white with a tinge of yellow; the back, most of the upper jaw, and part of the lower jaw, together with the fins and tail, are black; the tongue, the fore-part of the under-jaw, and lips, sometimes a little of the upper-jaw at the extremity, and a portion of the belly, white; the eyelids, the junction of the tail with the body, a portion in the axilla of the fins, &c. are grey: some have been seen all over piebald.* The older animals contain the most grey and white; under-size whales are altogether of a bluish black, and suckers of a pale bluish or bluish-grey colour. The skin of the body is slightly furrowed, on the tail it is smooth. It is supposed to attain its full growth about the age of twenty-five years, and the period of gestation is calculated to be between nine and ten months. The total length of the animal may be stated as averaging from 50 to 65 feet, and its greatest circumference from 30 to 40 feet; weight of a whale of 60 feet, about 70 tons.

Inhabits principally the Northern and Southern Seas.

Obs. From comparisons of the Skeleton procured at the Cape (by De Lalande) with others from the Arctic Regions, it has been considered by some Naturalists that the true Whale of the South Seas is a different species from that of the North Seas. Having no doubt as to the propriety of the conclusion, I have furnished a detailed account of that of the latter from Scoresby's excellent work, in order to enable persons possessing opportunities of observing those of the South Seas, to compare

* Scoresby's Account of the Arctic Regions, vol. i. p. 452.

their characters with those of the Northern Seas. I think the proportion the head bears to the body will be found to be very different, and even the form of the body itself. If thirteen feet be the size of the calf in the Northern Seas at the period of birth, as stated by Mr. Scoresbey, it will be found to be much inferior to what is observed in the South Seas, for I have myself seen more than one extracted from the *uterus* which had attained the length of nineteen feet.

Genus Balænoptera. *Lacepede.*

Head flattened horizontally; lower jaw longer than the upper; skin of the throat and breast with strong rugæ or folds; whalebones short; a short thick fin towards hinder part of back, more or less resembling a hunch: form more slender than in the true whales.

Balænoptera rorqual, Lacepede. Colour above black, beneath white; body behind the nape very thick; head short in proportion to the body; lower jaw rounded, longer and much broader than the upper, its anterior part often slightly scolloped; whalebones black, and seldom exceed three feet in length; they are stiffer, harder, and more horny than those of the common whale, and their inner edges and points have a fringe of bristly fibres; eyes situated above and very close to the angles of the mouth; the orifices of the spiracles close to the eyes, and placed in an elevated pyramid; pectoral fins lanceolate and at a considerable distance behind the angles of the mouth but on nearly the same level; the dorsal fin which is slightly notched commences opposite the anus and extends nearly to the tail, which is divided into two lobes, each of which is notched behind; under part of head and belly with longitudinal rugæ. Length between seventy and ninety feet.

Inhabits the seas about the Cape of Good Hope?—common in the North Seas.

Balæna musculus, Gmel. Lin. Balæne rorqual, Bennet.

Obs. From the descriptions I have received of the *Fin Fish* which often appears in the Bays of both the Western and Eastern Coasts of Africa, I feel disposed to regard it as the Rorqual. It may, however, prove to be a different species when those who can note its characters shall have an opportunity of examining a dead specimen. It is here rarely attacked by the *Fishers,* being considered dangerous, and of little value, from its yielding but a small proportion of oil. About twelve years ago one was killed in Table Bay which measured ninety-five feet.

Balænoptera Capensis, Smith. Head depressed, slightly convex above with a small projection on each side of spiracles; the apex of upper-jaw acutely rounded; lower-jaw much longer

and broader than upper-jaw, and with three or four subglobular elevations on each side near tip; back slightly arched, with a carinated and slightly elevated hunch towards the tail, highest about its middle, from whence it slants off to each extremity; hinder part of body carinated both above and below; throat and breast strongly marked with elevated, longitudinal rugæ, with deep corresponding furrows between them; eyes a little above the angle of the mouth, and the openings of spiracles rather in front of them; laminæ of whalebone 300 on each side, of a bluish colour, and margined on their inner edges by stiff horny bristles. Back and sides black; belly dull white with some irregular black spots. Pectoral fins narrow, and both their anterior and posterior edges irregularly notched, upper surfaces black, under surfaces pure white; hinder edge of tail fin nearly square with a slight notch at its middle opposite the back bone, on each side of which it is slightly convex, towards points a little concave. Length from tip of lower-jaw to hinder margin of tail fin thirty-four feet and a half; from tip of lower-jaw to angle of mouth seven feet and a half; from point of upper-jaw to angle of mouth six feet; from angle of mouth to base of pectoral fins three feet. Length of pectoral fins nine feet, width of the same near base two feet, near point one foot; width of tail from tip to tip nine feet; length of whalebone near angles of mouth one foot.

Inhabits the seas about the Cape of Good Hope.

Hump-back *of the Whale Fishers.*

Obs. The only specimen of this species which I have had an opportunity of examining, had lost the skin of the hinder portion of the back before I saw it, so that I am unable to describe the hunch from my own observation. Those who have been in the habit of seeing and killing this species all agree as to the character of the hunch, and from what I have myself observed at a distance through a telescope, I should feel inclined to regard their description as correct. They unite in asserting that there is nothing of the appearance of a regular fin, and all that I could ever distinguish from watching the animal when in motion and partly above the surface of the water, was a sort of semilunar elevation towards the tail and somewhat above the line of the back.

ADDENDA.

Fam. SAMIADÆ.

Genus Cercopethicus.

Cercopithecus pogonias, Bennett. The hairs of the upper surface are black, ringed with whitish, producing a grizzled appearance, which occupies the back part of the head, the fore part of the back, the sides, the outer surface of the anterior limbs, and the posterior hands. In the middle of the back commences a broad black patch, which extends to the tail, and is continued along its upper surface for about two-thirds of the length of that organ, the remaining portion being black both above and below. On the forehead the hairs are yellowish ringed with black; a few black hairs occupy the middle line; and on each side passing from above the eye to the ear is a broad patch of black. The whiskers expand very broadly on each side of the face; the hairs composing them are yellowish white, occasionally but very sparingly ringed with dusky black. The ear has internally a long tuft of hairs of the same colour with those of the whiskers. The outer side of the hinder limbs, the hands excepted, is yellowish grizzled with black, their colour being intermediate in intensity between the lightest portion of the sides and the whiskers. The under surface of the body, the insides of the limbs, and the under surface of the proximal two-thirds of the tail, are reddish yellow. Length of body and head seventeen inches; length of tail twenty-four inches.

Inhabits Fernando Po.

Fam. VESPERTILIONIDÆ.

Pteropus phaiops, Temm. Body large; nose long; ears short and pointed, fur long and abundant, slightly curled, membranes black, a black blotch upon the nose; fore parts of body pale yellow, breast light reddish, back black-maronne.

Inhabits Madagascar.

Obs. This is probably Pteropus Edwardii described at page 20.

Vespertilio Goudotii, Smith. (Goudot's Bat.) Hair of moderate length, longer on the face, head, and upper parts of

body, than on the lower parts. Head rather small; point of nose bare and black; nostrils round, and opening laterally; upper lip on each side behind nostrils thickly covered with long hair; ears as long as the head, slightly rounded at points, and each with a large deep notch on its outer edge; on the outer surface towards base covered with chesnut hair, on the inner surface toward inner edges with a thin sprinkling of short tawny hair; tragus long and tapering to a point. The surface colour of the upper parts of head and body light maronne or dull chesnut; of the under parts dull tawny or pale brown; the bases of the hairs above dusky, of those beneath dull black; membranes brown with a purplish tint; tail of the same length as the interfemoral membrane. Length from nose to base of interfemoral membrane two inches and a half; length of interfemoral membrane one inch and three quarters; expanse of wings nine inches.

Inhabits Madagascar.

Order FERÆ,

Felis Fearonii. Smith. Form robust; legs short; hair short on the body and extremities, rather longer on the sides and under parts of the neck, and longest on the belly and upper part of the neck; on the latter, forming a sort of a mane, which is brindled or clouded with black. Ground colour tawny white or a pale cream-colour, darkest upon the back and outer surfaces of extremities: the feet in some specimens light fulvous. Chin, anterior part of throat, and sides of neck behind the ears, without variegation; all the other parts of neck, body, and extremities, rather closely marked with small somewhat roundish black spots, which are largest upon the back and outer sides of thighs; on the lower parts of limbs they are inclined to an oblong shape: on the inner sides of extremities and belly the spots are less numerous, on the latter they are of a paler tint and less distinctly defined. Top of head and cheeks slightly brindled with black; the forehead is divided by a narrow longitudinal blackish stripe and a deep black line occurs over each eye; ears short and rounded at tips, outer surfaces with a deep black, transverse blotch, which is widest behind. Tail towards base variegated with black spots, smallest and most numerous upon the upper surface, about the middle it is marked with narrow short transverse stripes, towards the point with three or more distinct black rings; nails covered each with a tuft of long black hair. Length from forehead to root of tail three feet two inches; length of tail sixteen inches.?

Inhabits Southern Africa,—North-east of Natal.

Obs. The description of this species is not to be regarded as perfect, it having been drawn up from an examination of portions of skins of dif-

ferent individuals. I have as yet met with no specimen in which the skin of the face was complete. Judging from the appearance of the skins I have seen, I should be inclined to regard this species as approaching in figure the *Felis Chaus* of Guildenstadt.

Fam. VIVERRIDÆ.

Genus Viverra.

Viverra maculata, Gray. (Square-spotted Genet.) Colour grey-brown, with a brown streak down the back, commencing narrow just between the bladebones and widening as it reaches the tail, slightly erectile like a crest, with three interrupted narrow streaks on the back of the neck, reaching over the shoulder and extending along the sides of the back in three series of spots, the spots of the two higher series square, those of the highest series the largest and nearer together, of the lower series roundish; the sides of the belly with scattered black-brown spots; shoulder and hind-legs with moderate roundish black spots; beneath pale whitish, with a few scattered small dark spots. Head grey-brown, with a dark rough place on each side the nose and a small one on the inner angle of the eyebrow, a long white spot before the eye, and six small blackish spots between the ears, in front of the face, placed in two groups of three each. Tail reaching to the ears, rather furry, triangular, broader beneath, with seven black bands, increasing in breadth towards the end. Feet black-brown.

Inhabits Northern Africa.

Viverra binotata, Temm. (Two-spotted Civet.) Colour grey, with scattered black spots of unequal size, and two white spots on the top of the shoulders; tail longer than the body, spotted and ringed with black.

Inhabits Ashantee.

Genus Cryptoprocta, *Bennett.*

Plantigrade; toes webbed almost to their extremities, five on each foot, armed with claws more or less retractile, on the fore-feet sharp, and resembling those of cats; an anal pouch.

Cryptoprocta typicus. General appearance approaches that of *Paradoxurus*; but the fur is short, adpressed and of uniform colour, and the tail is slender, cylindrical, and equally hairy all round, rendering it probable that this organ is not subject to being curled in the manner usual to that genus. In the young individual belonging to the Zoological Society, "the dentary characters could not be ascertained, its teeth being only of the deciduous class. Its anatomical structure resembles, in the shortness of the intestines, the size and direction of the cæcum;

the disposition of the superficial vessels of the kidneys, and in some other respects, that of the typical Viverridæ, and approaches nearly to the structure of the Felidæ. Mr. Bennett stated his impression that the animal should be regarded as the type of a new genus, nearly allied to, but distinct from, Paradoxurus."

Inhabits Madagascar.

Cryptoprocta ferox, Bennett. *Proceedings of the Zoological Society of London*, 1833, *p.* 46.

Fam. MANGUSTIDÆ.

Genus Crossarchus. *F. Cuvier.*

Incisors $\frac{6}{6}$, *canines* $\frac{1}{1}\frac{1}{1}$, *molars* $\frac{5}{5}\frac{5}{5}$,—36. *Teeth like those of the Ichneumon; head rounded; snout slightly prolonged, moveable, terminated by a muzzle, on the margins of which the nostrils are situated. Eyes small, pupils round; ears small and round, with two prominent lamelliform lobes placed one above the other in their concavity. Fur composed of two kinds of hair; feet with five toes; an anal pouch; tail moderate; form rather robust.*

Crossarchus typicus. (The Mangue.) Colour brown throughout, paler on the head, and slightly tinted with yellow, most distinct on the anterior parts, which arises from the hairs being deep brown at their base and tipped with yellow, and this latter portion of them is longer towards the neck and shoulders than on the hinder parts and thighs. The woolly hairs are numerous, and covered almost entirely by the silky ones, some of which are an inch and a half long; they are, however, very short on the head and limbs, and the tail appears to be furnished with them only on its upper and under surfaces; the hairs incline irregularly in various directions. Tail, when the animal is in motion, usually curved downwards. Length of the head three inches and a half; of the body, eight; of the tail, seven: medium height five inches.

Inhabits the Western Coast of Africa.

Crosarchus Dubius, F. Cuvier. *Hist. Nat. des Mammiferes.*

Obs. The animal which forms the type of this genus is allied by certain of its characters both to *Ichneumon* and *Ryzæna*, and is to be considered as holding an oscillant position between them.

Order GLIRES.

Genus Aulacodus. *Van Swind.*

Incisors $\frac{2}{2}$, *canines* $\frac{0}{0}\frac{0}{0}$, *molars* $\frac{4}{4}\frac{4}{4}$,—20. *Canines of upper jaw deeply furrowed; molars lamellated; no cheek pouches; anterior feet with four toes and the rudiments of a thumb, hinder ones*

*with four toes; nails curved, strong, rounded above, dilated and channelled beneath; tail moderate, hairy and attenuated.**

Aulacodus Swinderianus, Temm. Covering consisting entirely, except on the tail, of flattened somewhat spine-like bristles, from an inch to an inch and a half in length, the tips only of which are flexible and hair-like: the dark space which occupies the greater portion of each of the bristles exhibits a changeable metallic lustre, varying in different positions from deep steel-blue to bright copper-red. The length of the body and head is seventeen inches, or measured along the convexity of the back twenty; of the tail nine inches. The ears nearly concealed by the bristly covering, is 1⅛ inch long and 1 broad.

Inhabits Sierra Leone.

Ground Pig or Ground Rat *of the Natives*. Probably the Wild Rat, bigger than a Cat, mentioned by Bosman.

Obs. Temmicks considers this genus as near to *Arctomys*.

Fam. CAPRIDÆ.

Capra nubica, F. Cuvier. (The Wild Goat of Egypt.) Horns two feet long, half black, compressed on their inner surfaces and rounded in front, with twelve or thirteen prominent nobs. Colour of hair fulvous-grey mixed with brown; lower parts of shoulders and flanks brown; legs brown before and white behind, pasterns white with spots of the same colour upon the heels and wrists, the brown forms a ring behind the toes of all the feet; dorsal line blackish, which is also the colour of the tail; beard black.

Inhabits Upper Egypt.

Geoffroy St. Hclaire et F. Cuvier. *Hist. Nat. des Mamm. Livr.* 50.

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* "The deep *sulci* on the anterior surface of the incisor teeth of the upper jaw are situated nearer to the inner than to the outer edge of the tooth, and divide its face into three ridges, the inner of which is half the breadth of the middle, and the middle less than half the breadth of the outer. The molar teeth of the upper jaw have two re-entering folds of enamel on the outer, and one on the inner side; the outer passing beyond the middle of the crown, the inner central and less deeply entering: all the teeth are nearly equal in size; the anterior three are nearly square; the posterior somewhat rounded: there is no notching on the outer edge, but a distinct notch exists where the enamel folds in on the inner side, especially of the three posterior teeth. In the lower jaw the first molar has three folds of enamel on the inner side passing beyond the middle of the crown, and one small fold slightly notched on the outer: the second and third have two inner folds and one outer, all notched at the edge: the posterior is nearly similar, but more rounded behind. This system of dentition bears a greater resemblance to that of *Erethizon*, F. Cuvier, than to that of any other genus of the *Rodentia*."

PART II.

BIRDS.

Order RAPTORES. *Vigors.*

Bill stout, covered with a cere at its base, its tip bent down; less strong, short or of moderate length; tarsi naked or more or less covered with feathers or down; toes four, three before and one behind; claws strong, moveable, arcuated, acute or blunt.

Fam. GYPOGERANIDÆ.*

Bill robust, strongly curved at the point; legs very long, slender, feathered to, or nearly to the tarsi, the latter scutulated or reticulated; the middle and outer toes united by a small membrane at their base; wings moderate.

Genus Gypogeranus. *Illiger.*

Bill robust, shorter than the head, straight at its base, curved towards its extremity; sides compressed; nostrils lateral, oblong, oblique, open, and situated in the cere; tongue fleshy and pointed; space round eyes naked; eyebrows prominent; tarsi scutulated; wings armed with three obtuse spurs; the first five quills of equal length; tail feathers twelve.

Gypogeranus Africanus. Cere, and naked space round eyes, yellow or orange; bill blackish towards base, light bluish white towards tip; eyes light brown; top of head, hinder part of neck, back and shoulders blue-grey; sides of neck, throat, and breast pale grey; belly white; vent and thighs black, most of the feathers narrowly tipt with white. Hindhead with a long crest of narrow black feathers that increase in width towards their points which are generally white; greater wing coverts and quills black. Tail rounded, the two middle feathers nearly double the length of the others, hoary grey, each with a broad black band towards point, the point itself white; the lateral

* Accipitres Gallinacées, Lesson, *Traite d' Ornithologie, p.* 14.

feathers white towards base, ashy towards points, and crossed by two black bands, the first narrow, irregular, and separating the white and grey colours; the last broad, and near to the extremity; tips of all the feathers white. Legs and toes yellowish brown; claws black. Length from bill to point of centre tail-feathers three feet five inches.

Inhabits Africa,—common in South Africa.

Falco serpentarius, Lin. Vultur serpentarius, Lath. *pl.* 2. Ophiotheres cristatus, Vieill. *Gal. pl.* 260. Le Mangeur de Serpents, Levail. *pl.* 25. Secretary Bird *of the Cape Colonists.*

Fam. VULTURIDÆ.

Head, and more or less of neck, divested of feathers; the former covered with down, hair, or fleshy membranes; cere bald or hairy; tarsi robust and reticulated; claws weak; quills longer than the tail, the first quill the shortest; the fourth the longest.

Genus Vultur. *Illiger.*

Bill thick and rather short, deeper than broad, its base covered by a cere; upper mandible straight, bent towards the point; under mandible straight, rounded, and inclined at the point; head naked or covered with short down; nostrils naked, lateral, opening diagonally towards the edge of the cere; legs strong, furnished with slightly-bent claws; the middle toe longest, and united with the exterior one at the base; the third and fourth quill feathers longest.

Vultur arrianus, Picot La Peyr. Colour brown, inclining to black and sometimes to fulvous; bill brown-black; cere violet; eyes dark brown; head and nape bare; skin bluish; the rest of neck covered with a fulvous down; lower part of neck with a colleret of long narrow delicate feathers; tarsi partly feathered; the bare portion, and the toes, greyish; claws black. Length three feet six inches.

Young.—The entire of the neck covered with down, and all the feathers of the upper parts terminated by a colour of a lighter tint.

Inhabits Egypt, India, and Europe.

Le Vautour noir d' Egypt, Savig. *Syst. des Ois. d' Egypte, p.* 14. L'Arrian, Gerard. *Tab, elem. d' Orn. vol.* i. *p.* 11. Cinereous, Ash-coloured, and Bengal Vulture, Latham, *Ind. Orn.*

Vultur fulvus, Gmel. (Fulvous Vulture.) Head and nape covered with dirty short whitish hairs, or bristles; lower part of cervix bare, and of a bluish colour; lower part of

throat, and middle of breast, covered with short, bristly, grey-brown feathers; rest of throat, sides of neck, and upper part of cervix, with fine whitish down, and bristles resembling those of the head. Skin, as seen through these coverings, between livid blue and purple; lower part of neck behind with a frizzy ruff of short white feathers; plumage of upper and under parts white, or a pale blossom colour; primary quill feathers black; secondaries greyish, shaded with black towards their shafts; tail rounded, and composed of fourteen black feathers, tinted with grey. Bill, legs, and toes, livid blue, with shades of dirty green; claws black; eyes light yellowish red. Length from three feet to three feet six inches; breadth from tip to tip of wings, about eight feet. Young specimens are more or less variegated with dull brown.

Vultur Kolbii, Lath. *Ind. Ornith, Supp. vol.* i. *pl.* 10. Le Chasseficnte, Le Vaill. *Ois. d' Afriq. pl.* 10. (young.) White Ass-vogel *of the Cape Colonists.*

Vultur auricularis. Bill strong; tip of upper mandible yellow; rest of that, and the lower greenish yellow or horn-colour; cere bluish; eyes dark brown; skin of head, and unfeathered portion of neck, vermilion or livid purple, with white variegations; the head thinly covered with a brownish white down and some black hairs; the neck bare, or with a still more scanty covering of the like materials; and on each side thereof a thin fold of loose skin, extending downwards and forwards several inches below the ears, usually about one inch in breadth, and similar in colour to the head. Throat, and middle of breast, covered with fine short black feathers; back of neck with a ruff of long narrow coarse brownish feathers, many of which are turned forwards; lower part of cervix, back, and shoulders, dark brown, many of the feathers margined with a lighter tint; quills and tail black, the latter consisting of twelve feathers. Under parts brownish black, the feathers long, narrow, somewhat curved, broadly edged with white towards their bases, narrowly with dirty light brown elsewhere; thighs with a few brownish feathers on their outer sides, but their principal covering is a fine reddish brown down; legs and toes pale bluish, with a tinge of green; claws dark horn-coloured, inclined to black. Length about three feet four or six inches; expanse of wings ten feet.

Inhabits Africa.

Vultur auricularis, Shaw, *Zool. vol.* i. *p.* 24. L' Oricou, Le Vaill. *Ois. d' Afriq.* i. *pl.* 1. Black Ass-vogel *of the Cape Colonists.*

Vultur Galericulatus. Temm. Brown-black; wing coverts varied according to the age with brown, yellow, and whitish;

the back scapulars and belly pure white; cere blue; head and neck naked, of a rosy-violet colour; bill yellow; tarsi flesh-coloured. Total length two feet five inches.

Inhabits Western and Northern Africa.

Vultur monachus, Gmel. Head surmounted by a tuft of brown down; cheeks and throat covered with a black down; circle round eyes white. Feathers of the collcret long and slender; all the naked part of the neck between the collar and the black down, dull white. The lower part of neck naked, the skin bluish and plaited; tarsi and toes whitish: the entire of the plumage an uniform brown. Length from bill to extremity of tail about three feet.

Inhabits Africa.

Voutour chincou, *Levaill. Afriq. pl.* 12. Temm. *pl. col.* 426.

Vultur niger, Gmel. (Black Vulture.) Skin of head and part of neck blue, and covered with down; the neck with a collcret of long, narrow, bristly feathers; bill black; cere, tarsi, and toes bluish. The body, the wings, and the tail, black; the eyelids grey-white. Total length three feet and a half. In birds of the first, second, and third years, the plumage is more or less mixed with brown.

Inhabits Europe and Africa.

Egypius Niger, Savigny, *Oisseau d' Egypt et de Syrie.*

Vultur occipitalis, Burchell. (Tufted Vulture.) Bill and feet flesh-coloured; bare space round the eyes white; eyes of the colour of burnt umber; top of the head covered with a white feathery wool, which, at the back part, is longer and stands in a reversed position. Colour above blackish brown; the thighs and under-parts of body and neck white; quill feathers and tail black, the secondaries white towards their extremities. The part of the neck which is bare, together with the base of the beak, white. Total length two feet; expanse of wings seven feet.

Inhabits Africa.

Genus Neophron. *Savigny.*

Bill slender, long and rounded, swelled towards the point, and hooked; lower mandible shorter than the upper and truncated; nostrils oval and open; cere broad; cheeks and throat naked; tarsi naked, slender, and reticulated; third quill feather the longest. Tail composed of fourteen feathers.

·*Neophron Ægyptiacus*, Savig. Bill horn-coloured; cere, forehead, space round the eyes, cheeks, ears, chin, and part of the throat, bare, and of a yellow or saffron colour; eyes light reddish brown; plumage white, usually tinted with yellow; feathers of nape narrow, elongated, and pointed; primary quill feathers black; secondaries greyish black, with the outer vanes more or less broadly margined with white; tail fan-shaped, and pure white; legs and toes dirty greenish white, sometimes inclined to reddish yellow; claws dark horn-coloured. Length from one foot ten inches to two feet two inches; expanse of wings about five feet.

Female.—A little larger than the male, but of the same colour.

Young.—Black or brownish black, streaked or spotted with dull white or tawny.

Inhabits Africa.

Vultur Percnopterus, Gm. L' Ourigourap, Le Vaill. *Ois d' Afriq. pl.* 14. Le Percnoptere, Cuv. *Reg. Animal.* White Crow *of the Cape Colonists.*

·*Neophron niger*, Lesson. Plumage brown, variegated with fulvous on the thighs; tarsi black; the top of the head, the cheeks, and the front of the neck, entirely bare; the lower part of neck and the posterior portion almost to the hind-head, covered with a close greyish down. Size of the last.

Inhabits Senegal.

Cathartes monachus, Temm. *pl. col.* 222.

·*Neophron carunculatus*, Smith. Bill greenish black towards base, dark horn-coloured at tip; eyes dark brown; front, crown, sides of head, and upper part of throat bare, and of a purple colour, with eight or ten small white transverse caruncles on the latter. Nape, upper part of neck, and lower part of throat, covered with a light reddish brown down, and between the latter and the caruncles already mentioned, an oval patch of black feathers; lower part of cervix, interscapulars, and back, deep brown; the feathers all edged and tipt with a lighter tint; shoulders nearly the same. Primary wing feathers blackish, with a greyish tinge towards quills; secondaries blackish brown, with the colour of the tips and edges lighter than that of the centres; thighs covered with a white down in addition to some long brown feathers on the outer sides; legs and toes pale greenish blue; claws black. Length two feet two inches; breadth from tip to tip of wing five feet six inches.

Inhabits Cafferland and the country about Natal.

Obs. This may perhaps be identified with the preceding.

Genus Gypaetus.

Bill large, robust, compressed on the sides, rounded above and hooked towards the point; lower mandible short, straight, and obtuse; cere basal, covered with strong hairs directed forwards; nostrils oblique, oval, concealed by the down on the base of bill; top of head covered with down; tarsi short, thick, feathered; claws robust, sharp, the inner and hinder ones much curved; the third quill feather the longest; tail composed of twelve feathers.

·*Gypaetus barbatus*, Cuvier. Bill black; head and cervix dirty sallow white; circle round the eyes, and space between them, and bill, covered with a deep-black hair, as well as each side of lower mandible, at base, also some similar hair under the bill, which is in the form of a large tuft pointing forwards; irides of two colours, viz.: yellow towards pupil, and fine red towards circumference. Front and part of sides of head behind eyes, as well as base of lower mandible, covered with a dense white down; rest of head and cervix dusky white, faintly tinged with rufous; back and shoulders dusky, inclining to black, the centres of the feathers being more or less distinctly, an obscure cinereous black, and the edges clear black, the shafts white. Primary and secondary quill feathers, together with the tail, more or less greyish; throat, breast, belly, and thighs, clear or dull rufous; toes somewhat granulated, and dusky black. Length about three feet.

Inhabits Africa and Europe.

Vultur barbatus et barbarus, Lath. *Index Orn.* Vultur aureus, Briss. *Orn.* Arend *of the Cape Colonists.*

Fam. FALCONIDÆ.

Head entirely, or in a great measure, covered with feathers; bill strong, hooked, and furnished with a cere; border of upper mandible even, or toothed; claws stout, very acute, much curved, and retractile.

Genus Aquila.

Bill very strong, straight near base and curved towards the point; cere hairy; nostril elliptical and transverse; the third, fourth and fifth quill feathers the longest; tarsi covered with downy feathers to the toes; tail composed of twelve feathers.

·*Aquila nævia*, Linn. Body, head, wings and tail, shining brown of different tints, lighter towards the rump and thighs; the feathers of the tarsi and under tail coverts are light brown; tail tipt with light rufous; bill black; eyes, cere, and toes, yellow. Length twenty-two inches.

Young.—Colour deep shining brown; wing coverts towards points with large oval greyish white spots; under tail coverts and secondary quill feathers terminated by large spots of the same colour, and the flanks and thighs are sprinkled with others of a smaller size.

Inhabits Africa and Europe,—common in Egypt.

Le petite Aigle, Buff. L'Aigle tachete, Cuv. *Reg. Animal.*

Aquila heliaca, Savig. Top of head and occiput rufous; the feathers edged with a brighter tint; body above, shining brown; beneath, black-brown, with the exception of the belly which is rufous-yellow; part of the upper wing coverts white. Tail grey-ash with irregular black bands, each feather with a very broad black band towards its point, and tipt with yellowish. Eyes whitish yellow; nostrils linear, with the upper edge notched. Length about two feet and a half; female three feet.

Young.—Head and neck straw-coloured and whitish; upper parts of neck and back brown, lightest along the middle of the feathers; the under parts straw-coloured and striped longitudinally with brown-black.

Inhabits Egypt and Europe.

Aigle de Thebes, Savig. *Ois. d' Egypt.* Falco Imperialis, Nam. Aquila mogilnik, Gmel.

Aquila Vulturina, Shaw. Bill blackish blue, verging here and there to a light horn-colour; cere deep yellow; eyes reddish brown; space between them and bill pretty thickly set with black bristles; back and tail coverts white; plumage elsewhere deep black; tail more rounded than in the foregoing species; toes deep yellow; claws black. Length from bill to base of tail seventeen inches; length of latter twelve inches; expanse of wings about seven feet.

Young.—Head, back, and sides of neck, clear reddish tawny, inclined to a pale chesnut, the interscapular and shoulder feathers dirty brown, edged, and strongly tipt with tawny; the back a mixture of chesnut, brownish black, and dirty reddish white. Below reddish brown of various tints, with the centres of feathers blackish or blackish brown; legs light tawny.

Inhabits South Africa.

Falco Vulturinus, Shaw, *Zool. vol.* vii. *p.* 58. Le Caffre, Le Vaill. Dassie-vanger and Berghaan *of the Cape Colonists.*

Aquila rapax. Bill livid blue towards base, dark horn-coloured at tip; cere yellow; eyes reddish brown; front, crown, neck, interscapulars, and back, pale tawny, with here and there brownish variegations; tail coverts tawny or dirty white; shoulders varied tawny and dark brown; scapulars blackish brown, more or less distinctly tipt with reddish white. Primary

quill feathers blackish brown, some of them edged on outer vanes with tawny, all tipt with reddish white; secondaries dark dirty brown, narrowly edged and tipt with reddish white; primary quill feathers black; secondaries blackish brown on the outer vanes, on the inner greyish, variegated by many transverse dark bands; tips reddish tawny. Tail rounded, brownish grey, and much mottled by partial indistinct transverse narrow dusky black bands; tips of feathers all tawny; under parts tawny with brown variegations, particularly numerous on the flanks and anterior part of the belly; thighs dark ferruginous; toes yellow; claws dark horn-coloured. Length about two feet four inches.

Young.—Prevailing colour chesnut, without the brown variegations of the older bird; feathers of the head and back of neck tipt with light tawny. Tail dirty brownish grey, tipt with reddish white; cere and toes dull yellow; claws black; eyes yellow.

Inhabits South Africa,—common.

Falco rapax, Temm. *pl.* 455. Falco nævioides? Cuv. Aquila choka, Smith. *South African Quarterly Journal, vol.* i. *p.* 114. Chok *of the Cape Colonists.*

'*Aquila Bellicosa*, Daudin. Bill bluish at the base, black elsewhere; eyes fine brown; space between them and bill thinly covered with black bristles; plumage of hindhead a little elongated, so as to form a very slight crest. Feathers of head, and of back and sides of neck, variegated blackish brown and white; interscapulars, back, tail coverts, and shoulders, more or less deep brown; with the tips of all the feathers, but particularly of those of the latter, dusky white; throat, breast, belly, and legs, pure white. Primary wing feathers black, tipt with white; secondaries alternately banded with dusky blackish brown and dull hoary grey, all broadly tipt with white. Tail slightly rounded, with each feather banded more or less directly across by black and hoary grey, the latter usually passing to white towards the inner margins of the inner vanes, all distinctly tipt with white. Tarsi and toes a light livid green, inclining sometimes to yellowish green; claws deep black and much curved. Length from bill to base of tail twenty inches; length of latter twelve inches; expanse of wings about eight feet and a half.

Young.—Above blackish brown; throat and breast nearly black; belly and legs dull white with black blotches.

Inhabits South Africa.

Falco Armiger, Shaw. vii. 57. Le Griffard, Le Vaill.

(*To be continued.*)

SOUTH AFRICAN

QUARTERLY JOURNAL,

SECOND SERIES.

No. 3. APRIL—JUNE, 1834. Part 3.

INSTRUCTIONS ADDRESSED TO THE DIRECTOR OF THE EXPEDITION INTO CENTRAL AFRICA.

To Dr. ANDREW SMITH, *(or the) Director (for the time being) of the Expedition into Central Africa.*

SIR,—In offering to you certain general instructions for the purpose of elucidating their views as to the object and conduct of the enterprise committed to your direction, the Committee of Management take the earliest opportunity of expressing their confident reliance on your Zeal, Talents, and Experience, as of themselves enabling you to apprehend and provide for the proper object and most beneficial detail in such an undertaking, and they therefore expect that you should not consider yourself bound by any decision of theirs, to adopt or reject, in deference to their opinion, any measures of which their views at present do not coincide with the judgment you may be led to form in your progress.

They feel certain, moreover, that any measure which you may conceive it necessary to adopt amid the unforeseen occurrences of this enterprise, will meet with approbation from the Shareholders. As, however, amid the incidents to be considered and provided for as contingent, the expedition may be deprived of your services, it is the wish of the Committee that the intention and the proper course of proceeding, as far as such can be determined at present, should be defined and rendered familiar to the parties composing the expedition.

It is to be hoped that this may be only the first of a series of efforts prosecuted by the same means, and deriving their support from the same sources, but the fulfilment of this expectation must evidently depend in a great degree on its success. We cannot expect that our limited Colonial Society should feel justified in supporting any measure tending to sacrifice its valuable members and waste its resources, for objects solely of contingent and distant benefit, should it

happen that the consequences of this endeavour confirm the impression of peril attendant on the view generally taken of it. However wide and promising therefore may be the views of benefit we entertain as about to arise from the knowledge we may gather, or the means and sources of commercial and scientific enterprise which the expedition may unveil, these views must be held in subservience to the recollection that the unimpeded progress and absolute safety of this one is of paramount importance as a guide, model, and inducement to others: this, therefore, is ever to be kept in view, and first considered in all its undertakings, and any measure obviously unsafe, even though its advantages, supposing it successful, should seem to be many and eminent, ought to be carefully avoided. While our failure would, by its effects on society here, necessarily damp our prospects of future benefit, it is to be apprehended that it would also have a disastrous influence on the natives to be visited. Even disaster from natural causes might diminish the impression of European skill and power; and acting on the excited superstition of the savage might quench his desire for our intercourse; and should it arise from the rapacious ferocity of the native tribes it would erect a more serious obstacle to future progress in their gratified appetite for plunder and their jealousy of retaliation. These views should inspire especial caution in regard to every proceeding, or even verbal enquiry among tribes where it is to be suspected that such lamentable incidents have already occurred. The impression of its safe advance and return, and of any benefits it may confer on those whom it visits, will unquestionably proceed far in advance of its presence, and necessarily subdue or weaken those obstacles which may at present restrain its proceedings within regions where the Colonial influence may be in some respects considered as overlooking its movements and watching for its safety.

Our inquiries lead us to anticipate that the natives of the interior districts adjoining this colony, are generally disposed to welcome the approach of travellers, and to treat them respectfully, lest however the opportunity of easily acquiring by plunder what they exceedingly covet, should prove too tempting for their respect or caution, it is requisite that such an apparent preparation to repel assault should be preserved as may render it obviously perilous to the assailants; separation of the party must therefore be avoided when holding intercourse with them, and if a division should be unavoidable, the main body must be kept in sufficient strength, and held in readiness to aid the detachments or serve as refuge for them. It will best accord with the object of the expedition, that not only every reasonable probability of avoiding collision should be shunned, but that all scenes and situations offering any

likelihood of its occurrence, should be well examined before they are approached.

It will be inconsistent with any beneficial result, that, in its progress outwards, the expedition should force its way through the territory of any tribe disposed to resist it, if no persuasive means be found of avail to overcome their repugnance, the advance in that direction must cease: it is only in case of the party being itself attacked, or being beset by a force showing an obvious disposition to assail it, and a determination to oppose its progress in any direction, or in case of the defiles of a territory being occupied and closed against its return, that the Committee can reckon it justifiable to exercise upon the lives or persons of the natives those formidable means of warfare with which the expedition has been furnished. It will be proper that each individual attached to the expedition should have a determinate station, in which it is expected that he shall be found in cases of emergency, and it will be well that the measures necessary to be adopted should be fully illustrated and impressed upon all by such previous training as circumstances may admit of.

In regard to the territory the expedition is to visit, there are two methods in which it may arrive at beneficial results: it may either sweep rapidly over a great length of country, with the object of attaining the most distant point which the time allotted to it, or the duration of its resources may enable it to reach; or it may leisurely examine in detail, throughout its length and breadth, the condition, capabilities, and productions of a district of more manageable dimensions. The Committee conceives that the former might be perhaps the more interesting method of proceeding, on account of the greater probability of romantic peril, adventure, or discovery, but that these very circumstances of greater uncertainty and danger, do, in this case, preclude our aiming at the comparatively barren honour of exciting wonder, and of throwing a partial and obscure light on an extended region; the Committee therefore assumes that the last-mentioned of the two courses is, in all respects, more accordant with the views and interests of the Subscribers, as expressed in the Prospectus; the Committee therefore recommends that no endeavour be made to penetrate beyond the parallel of 20° south latitude, and that the attempt to reach that parallel be made, only if, in the first place, circumstances favour it greatly, and, secondly, if the intervening districts do not afford objects of sufficient interest and importance to occupy the attention of the expedition. The territory limited by that boundary is about four times the extent of the British Islands. It is in truth to be anticipated that the wide regions between the Cape Territory and the Southern Tropic will have sufficient extent and variety

for the time and resources to be employed in our present undertaking It will, therefore, be advisable that the expedition consider Klaar Water (Griqua Town), or Lattakoo, as the starting point or base of their operations, and that its first effort be the examination of the district from which issue the northern branches of the Gariep and the streams which fall down to the Indian Ocean, that then the dividing ridge be traced towards the North, leaving it to the discretion of the Director to determine at what parallel he should change his course, to the North or West. Our present information leads us to esteem it advisable that the Eastern side of the slope be examined first, in order that if the great desert of Challahenga should extend far to the eastward, so as to bar the progress of the expedition towards the centre of the Continent, there may remain the unexplored territory along the Western slope to occupy its attention in returning. Much of the ultimate importance and interest, as well as the security of guidance and prospect of safe return of the Expedition, will of course depend on obtaining an exact knowledge and preserving a faithful record of its route, which can only be done by the aid of Astronomical observations made with due regularity and precaution, not only at such stations as form the most interesting features at the moment, in the eyes of those concerned, but at every station where the Expedition may rest long enough to permit observations to be taken deliberately, and with due regard to safety both of the observer and instruments. The track of a caravan on land, as of a ship at sea, is defined as well by the less as the more remarkable points through which it passes, and it may very easily happen that stations of the highest interest in a commercial, political, or physical point of view, may, by reason of that very interest, be inappropriate for selection as principal observing stations, either from the attention of every individual being distracted to duties of immediate necessity or from the risk attending the exhibition of instruments in the unavoidable presence of a rude, curious, and suspicious population. In all such cases it will be proper to connect by observations of a less elaborate nature, those stations with others not far distant, which, although less intrinsically important, may be easier of exact determination. The Committee would therefore recommend, that stations of observation be classed as either *primary* or *secondary*: those to be considered primary stations whenever the circumstances may appear particularly favourable, by reason of leisure from other occupations, expected duration of halt, and freedom from annoyance, to afford a good determination of the longitude and latitude, such as may serve to render them useful for Zero points, to which the secondary stations may be referred, either by dead reckoning of time and distance or by such less elabo-

rate observations as can be obtained at the secondary stations themselves. Of course, however, should circumstances permit, the more important in other respects the point which can be made a primary observing station the better, and the Committee would expressly notice Griqua Town, Lattakoo, Kurrechane, and Meletta, as points of which the Geographical position should be determined with care by observations on the spot, and the observations then made transmitted home along with the latest communications with the Colony. Since, however, the circumstances which may render stations objectionable as primary points are mostly of a moral or political nature, it is expected that no great difficulty will occur in fixing them at positions of especial geographical interest, as at the confluence of rivers, at the extreme borders or on the culminating points of mounting ranges, on remarkable rocks, &c. or at least of determinating their bearings and relative situations with respect to such prominent features, with some degree of exactness. A combination of circumstances of this kind of local interest will of course have its due weight in determining (*cæteris paribus*) the halt of the Expedition.

At primary stations the Committee recommend the assiduous application of every instrumental means for the determination of the three elements of latitude, longitude, and elevation above the level of the sea, and especially, at such stations, as many series of lunar distances as possible should be procured in addition to the usual sights for time, (or observations of the altitudes of heavenly bodies near the prime vertical,) which, together with meridian observations for the latitude, they would recommend to be practised daily as a matter of regular duty, at every station, as well primary as secondary. At primary stations also the barometer and thermometer should be observed at regular intervals, and the magnetic variation ascertained *by taking the sun's azimuth immediately before and after the observation for time, (noting the exact moments, and thus obtaining data for interpolating to the time of observation*). At such stations likewise a careful investigation of the Index errors of Sextants should be made, the zero points or index corrections of the Sympiesometer should be determined by leisurely comparison with the mountain Barometer (giving time for the instruments to attain the same temperature,) and the difference noted in the observation books. The necessity of frequent comparisons of these instruments will be apparent if it be considered that in the event of fracture of the Barometer tube, no other means will exist by which the zero point of a new one can be determined. Occultations of stars by the moon, and, if possible, eclipses of the satellites of Jupiter should be observed whenever an opportunity may occur. The former especially, affording the best known method of ascer-

taining the longitude by a single observation should be constantly borne in mind, and the Almanac consulted several days in advance, so that no occultation of a large star certainly identifiable, should be allowed to escape through inadvertence.

The Committee especially recommend that every observation made should be registered in a book devoted to that purpose, and preserved *in the exact terms of the readings off of the instruments and Chronometers*, and kept rigorously separate in its statement from any calculation thereon grounded, and that the observed or presumed index or zero corrections, whether of Chronometer, Sextant, Barometer, or other instrument, should be stated separately in every case, and on no account incorporated with observed quantities, and, moreover, that the observations upon which such index errors have been concluded, should also be preserved. Since however the guidance of the expedition will necessitate the calculation of many observations on the spot, the results of such calculations should be entered (as such) beside the observations from which they have been concluded.

The Committee farther recommend, that the Chronometers with which the expedition has been provided by the liberality of His Majesty's Government, should on no account be corrected by moving the hands, however great their errors may become, not even in the extreme case of one or both of them having been allowed to run down. In case of such a misfortune (which should be most carefully guarded against by making it the daily duty of more than one person to remind their bearers to wind them at a stated hour) it will be most convenient in place of setting them, to defer winding them until the hours and minutes come round, at which they may respectively have stopped, as near as may be ascertained from one to the other or from both, to other watches of the party, and such event, should it take place, should be conspicuously noted in the observation book; and, as a further and useful precaution, it is recommended to keep some of the best-going watches belonging to individuals of the expedition, to mean Greenwich time, by frequent comparison with one of the Chronometers. In every case where time is observed express mention should be made of the Chronometer or other watch employed, designating it by the maker's name and number, so that no uncertainty may ever arise as to the proper application of the correction for error and rate.

The rates of the Chronometers should be examined at any station where the expedition may rest two or more consecutive nights, either by equal altitudes of a star or more simply by noticing the disappearance of any large fixed star from the same exact point of view, behind the edge of a board fixed at some considerable distance in the horizon, and having its edge

adjusted to a vertical position by a plumb-line; the interval between the two such disappearances being an exact sideral day or 23 h. 56 m. 4 sec. mean time. Under the head of secondary observing stations may be classed those in which no lunar distances can be got, and when the sights for time and meridian altitude can only be superficially and imperfectly taken, or one without the other. With a view to the connection of these with the primary station and to the sketching out a Chart of the Country passed through, at every primary station a series of angles should be taken with the Sextant between remarkable and well-defined points in the horizon, dividing the horizon into convenient portions, and carrying the angles all round the circle back to the point of departure: and in the selection of such points two ends should be kept in view, first, the precise identification of the point of observation, in case of its being desirable to find it again; and, secondly, the determination from it of geographical points. The first of these purposes will require angles to be taken between *near*, the second between *distant* objects. For the latter of course remarkable mountain peaks will, if possible, be chosen. Of such, when once observed, the appearances from the place of observation should be projected by the *Camera Lucida*, and their changes of aspect and form as the expedition advances should be well and carefully noticed, to avoid mistakes. The approximate distance of any remarkable object may be had by pacing or otherwise measuring more exactly, a base line of a few hundred paces, in a direction perpendicular to that in which it appears, erecting a staff at each end, and from each staff measuring the angle between the object and the other staff.

In this manner the neighbourhood of any station may be mapped down so as to be available for many useful purposes. In all such cases the compass bearings of the most important object in the horizon should be taken, and in the absence of the sextant angles, azimuth compass readings of each point may be substituted, though of course with less precision.

Indications of the progress of the expedition should be left at various points in its course, by making marks on rocks or stones, &c. and by burying documents in bottles. In regard to the latter it will be necessary to deposit them one foot deep at some known distance, say 15 feet from a conspicuous surface of stone, on which there is painted a circle containing the distance and bearing by compass of the bottle, from its centre, and that the situation of such places of deposit should also be ascertained by exact compass bearings of several remarkable points in the horizon, both near and distant, as well as by angles between them, carefully determined with a sextant, and noted down in the journals of the expedition for their own reference or that of future travellers.

In surveying the basin of a river, or in proceeding along the prevailing slope of a country, it is very desirable to determine as many points as possible on the same level, and form thus as it were a parallel of elevation to the level of the sea. A line of this kind traced at the altitude of, say 1000 feet, would determine in a considerable degree the physical condition of extensive spaces on the map on both sides of it. The stations of most interest will be found at the extremities of transverse arms of the ridge, or in the central and most retiring points of the intervening spaces. Let the general slope of the country on both sides of such stations, be noted as to its rate and direction; and in regard to the vallies which intersect the slope, let their width, direction, and general rate of declivity, and the section and velocity of their streams, be ascertained, and the probable course of the rivers, as far as it can be determined by the appearance of the country, and the reports of the natives; giving them the aboriginal names when they can be discovered. The altitude and acclivity of remarkable peaks or ridges should also be investigated, along with the nature of their climate and of the clouds formed upon them. It will be requisite also to mark with care the nature of the winds and sky as well as the temperature at stations in the neighbourhood, and to note the influence which changes of that description have upon the barometer, and observe also the temperature of deep pools or lakes and copious springs.

The geological structure of the country is especially worthy of minute and extended observation, and will require that notes be kept of all such appearances as indicate or accompany changes of structure in the formation or of components in the soil and surface, especially such fossil remains of plants or animals as may occur, and metallic ores, and that proper specimens accompany these notes, ticketed on the spot with precise localities.

The Botanical researches of the expedition will extend to the preservation of specimens of plants not found in the colony, and especially of transportable roots and the seeds of all such as may be found in a ripened state, noting localities and the varieties of aspect which vegetation puts on in different situations. In regard to other branches of natural history, as it is obvious that after a short experience of research under your direction, almost every one will be able to recognize and preserve what is rare or novel, no further instruction needs to be given, except the general expression of the desire of the Committee that all shall endeavour to secure for the Expedition whatever in any department they esteem valuable, it being expressly understood that every article collected by each individual belongs in property to the Subscribers to the Expedition collectively.

In regard to the inhabitants themselves it is of paramount in-

terest to gain an exact portrait of their life as respects their condition, arts, and policy, their language, their external appearance, population, origin, and relation to other tribes, or in general whatever tends to elucidate their disposition or resources as sharers or agents in commerce, or their preparation to receive Christianity.

It will be proper to ascertain their religious traditions or practices if they have any, distinguishing what is indigenous from the glimmering apprehension of great religious truths which necessarily spreads in advance of the scenes of missionary labour.

Examine also the state of their intellect generally, as exemplified in their social and political arrangements and common traditions, songs, or amusements, and particularly in regard to their knowledge of nature and their notions of its vast and varied proceedings, as thunder, rain, wind, &c.

Enquiries respecting commerce and the prospect of its extension are to be viewed as of no small importance in this undertaking. Every means must be used to ascertain its present nature, channels, and extent, and to determine the existing demand for foreign commodities, and the return which may be expected for them. Proper enquiries may also lead to some satisfactory views of its future condition, as indicated by the wants of the native population, or the objects of most importance to improve their condition, and the corresponding resources for exchange which may arise from a more beneficial employment of their industry.

Lastly, we may notice the propriety of making enquiries or gathering information with respect to similar enterprises, as whether the natives have traditions of movements of their own, or of the arrival of strangers among them. All that can be gathered respecting Dr. Cowan's expedition will be acceptable in the highest degree. The elucidation also of an isolated effort to struggle through the difficulties of African travelling should also be kept in view: it was made by a missionary of the name of Martin, who has not been heard of since he crossed the Colonial boundary in December, 1831. He is consequently supposed to have perished in the Gariep, or to have been destroyed on its banks, though, as it was his intention to avoid the establishments of Europeans or their lines of communications, there is a lingering possibility of his still surviving.

The articles fitted for carrying on commerce with the natives have three distinct objects:—First, by keeping up a constant appearance of traffic, to present in their eyes an appreciable motive for this visit to their territory. Second, to conciliate favour, or to procure provisions for the purpose of husbanding the resources of the Expedition. And third, for the purpose of procuring any profitable articles to carry on to the other

districts for the ends abovementioned, or to sell in the Colony at the termination of the enterprise. In regard to these the Committee has to remark, that attention to the two first-mentioned objects is indispensable, from its necessary connection with the safety and efficiency of the Expedition, and that the third is to be contingent on the acquisitions of the party in regard to its main object of collecting information as to the country, and securing what illustrates its natural history and resources, and on the state of its means of transport. The Committee therefore recommend that this third object be attended to only in case that it be necessary to send wagons back for supplies, or in case that in the homeward progress of the party there be room for such articles without incommoding it in its other operations.

(Signed) THOMAS WADE, CHAIRMAN,
J. HERSCHELL,
A. OLIPHANT,
JAMES ADAMSON, D.D.
T. M'LEAR,
A. J. CLOETE,
C. F. H. VON LUDWIG,
F. S. WATERMEYER,
JOHN CENTLIVRES CHASE,
HON. SECRETARY.

June 23*d*, 1834.

We have remaining a very small space of this Number to be occupied with a few of the many remarks which the preceding Instructions naturally suggest. It must always be remembered that such directions contemplate adaptations of a twofold sort: they must keep in view not only the objects which are best in themselves but those of them especially which may be most profitably executed. The end ought not only to be a useful end, and the means well fitted to reach it, but all ought also to conform to the cherished views, to the disposition, capabilities, and general preparation of those who are to effect it. The Committee has evidently executed this part of its task under that impression. Many things of a grander, perhaps, or of a more exciting character, might have been attempted: we doubt if any can be discovered more useful, or so suited to the nature of the resources and facilities we here enjoy. Any man possessing the common qualities of firmness and caution, with adequate resources, and in favourable circumstances—in none other could it be attempted, may run a race from parallel to parallel, and tell that a mountain rises to the right and a river flows to the left, and that barbarian life is of a firey temperament under the Equator, and he might display to our breathless

wonder the jostling dangers of climate, privation, and hostility, in the prolific abundance natural to those regions, and leave us little wiser than before. We have something greater than this aimed at in the Instructions: of which object the comparative character is, that it occupies less space, requires more time, and offers greater advantage. For details respecting these we refer to the Instructions themselves.

While we acknowledge then that it would not have been wise to have sacrificed in this case on behalf of objects having more romantic novelty and less usefulness, the facilities presented by the peculiar character of this expedition for sounding closely the depths of nature's capabilities and the condition of savage life in the regions it will traverse, we must not forget that mere territorial discovery of a general and extended character is more to us than merely a desirable event. Our position renders it every day more and more a *necessity* that we should measure the intensity of savage strength, and gauge the depth of barbarian resources in the untraversed regions of our continent: it is something to know the sources of trade they may afford, but it is of more value by far to know the sources of disturbance they may inclose. There are wide territories which are apparently possessed by tribes closely allied, and easily susceptible of union; their views and habits must be undergoing a rapid change; and a measure of years easily numbered may enable them to become very destructive, if such be their desire. It is thought a considerable effort, according to colonial measurement, to pursue and reduce a hundred pedestrian robbers. Could we then expect prosperity or peace to abide in our more distant provinces, if a native tribe stood in hostility against our frontier, in possession of a few hundred horses?

We may expect that Christianity, civilization, and commerce, may repress or pacify the ambitious or marauding temper of our neighbours. We trust it may be so, and that the Christianity and civilization of our own public transactions will offer to the eye and experience of the barbarian a peace-speaking and sedative example. Our confidence rests more surely on the efforts of the Missionary, whose endeavours have become everywhere full of hope, since in these latter times Christianity has become practised as of old, in diffusing civilization. The present undertaking is of vast importance in that point of view. It goes to measure, map and ascertain, it goes to tell what and in what way accessible may be the swarm of two millions of people which has been guessed to be the population of the great trapezium which it is instructed to traverse. This result equally with others requires the caution and leisure in its proceedings which the Instructions enjoin. It remains to be determined whether it be advisable to attempt any farther discovery from this point than the Expedition has now undertaken. Probably

at least only another such process, proceeding from the boundary which it is calculated to reach, will be either wished or attempted. It will be very long indeed before we be prepared to make the limit of this second extent the starting point for a third, and we may expect that the very central regions of the continent will before then be penetrated by shorter routes from the seas on either side. We are not among those who are sanguine that these very central regions can be attained in any other way, or that this country in particular presents any special facilities which can compensate for its distance, and hence a danger of failure which is obviously to be estimated at a higher ratio than as the distance. Considering how many blank and barren parallels of latitude lie noted on our maps, between us and the Mediterranean, the mind, in anticipation that all will ultimately be discovered, may forget the necessarily contracted space of one effort. Let us, however, keep in view proper measures of what this extent presents to us. From this place to the sources of the Nile, over which the baffled curiosity of Europe yet sighs in vain, is probably as far as the direct distance of Alexander's march from Macedon to the Indus, and from us to Zumbao, in the neighbourhood of the 20th parallel, is about equal to the space from sea to sea across the whole Australian continent. The parallel of 19° includes on this side of it almost all that is absolutely beyond the limit of European knowledge and observation in this section of Africa. It will be a very great achievement indeed, if with any proper degree of attention to mapping and collecting, the resources of our Expedition, and the favourable circumstances which we trust it will meet with should enable it to traverse this space: it will be highly satisfactory if we receive a distinct account of nature and men as they occur betwixt us and the tropic of Capricorn. It will not require less than three such, each resting on the acquisitions of its predecessor to bring us useful information of the Equatorial regions.

The most promising of all for that purpose is a scheme announced by Lieutenant Emery in No. III. of the Journal of the Geographical Society of London. He proprosed to start from Mombas, occupying nearly the apex of the great bight which presses in upon the African coast, north of the Mozambique Channel: it is therefore almost the nearest point of the coast line to the Equatorial centre of the continent. The place was lately British, and may be so still if it were thought worth accepting as a gift of its people. It is at all events overlooked if not ruled by the friendly power of our ally the Imaun of Muskat. There are the resources of a partial civilization about it, and the natives, including even the marauding Gallas, seemed to Lieut. Emery to be in no way hostile to the presence of a stranger among them. This last element, in the problem,

is, however, the most doubtful. Considering moreover the great extent of the Equatorial line as it spans from sea to sea, being greater than any one route yet realized by a European on this continent, we cannot tell how far indications at one end are responsive to realities at the other, and heavy indeed therefore would the probabilities be against the attempt to cross it there, proving different in its result from the many disastrous enterprises which already have exhibited to us—the angel of Death as the peculiar guardian of its secrets.

It is remarkable that almost simultaneously, both here and in London, attention has been directed peculiarly to the region which our Expedition proposes to explore. A pamphlet has been published by Mr. Cooley, recommending for that purpose an incursion from De la Goa Bay, and it is understood that a a traveller, in some respect or other, under the sanction and patronage of the Royal Geographical Society of London, has been dispatched to make the attempt. Now, the pamphlet, though presenting a compact and correct view generally of what is known in regard to the tribes and countries towards the interior, is tinged with considerable misapprehension of the condition of the place proposed as a starting point. The fluctuating circumstances of its population, and their consequent want of resources, combined with the deadly influence of its climate, the more favourable conception of which in Mr. Cooley's pamphlet is founded on very insufficient grounds, cannot fail, as far as we can judge, to render such a scheme utterly abortive, or at the best, productive of a very fruitless waste of life and of the resources of the highly talented and prospering association which supports it. Let us remark however, with regret, that whether it was that our proposals reached it in a time of great inconvenience or inadvertence, or that it despaired of our success, or that its affections were pre-engaged to the procedure we have noticed above, the Royal Geographical Society has not as far as we know afforded to our proposals any sort of notice whatever.

Something has been done to illustrate the condition of Eastern Africa, both as to its physical and political characteristics, by the voyages of Captain Owen and the observations of Lieutenant Emery. That elucidation however is of small amount, and may be condensed into a narrow compass. In regard to the former work we have met with great disappointment. Much of it is due certainly to the nature of the outfit, there was surely a wasteful parsimony in the Government, that it sent so few competent persons to profit by one of the most splendid opportunities for the survey of a new domain of organic nature which any period has offered. A Botanist was afforded from a private society; but his lamented decease left much undone. Other branches of natural history were left un-

attempted, and to do in that respect what might have been well done then, will require efforts equivalent in extent and expense. The narrator of the voyage has not dabbled very successfully in these matters on the strength of his own knowledge: blunders in that respect however, together with the multifarious gossip of the narrative, are in some respects redeemed by the important facts which it occasionally discloses, and by the minuteness and accuracy with which it may be inferred the main object of the expedition was prosecuted, in determining the varied and entangled outline of the extensive and interesting coast which it surveyed.

The facts presented to us are of the following character generally:

1. That from beyond the Equator as far as the southern mouth of the Mozambique Channel, the coast line is thickly planted with islands, reefs, and inlets, affording harbours of the most advantageous description in regard to access, security, and convenience; being in many instances natural inlets or straits of great variety, and in other instances the effect of the diffused and unrateable influence of the coral insects. Four or five important rivers also pierce the line of the eastern coast, and the confronting outline of Madagascar presents the same contrast to our impenetrable shores in the abundance and variety of its points of access and shelter.

2. Over the whole of this section of the Indian Ocean there exist the remnants of Arabian and Portuguese influence lingering in isolated points upon the shore: the latter especially now wasting from its own atrocious and inhospitable exercise. Humanity will certainly triumph in its extinction, if it be true that the cunning of its unhonoured decrepitude has been exercised in tempting, even recently, the native tribes to mutual slaughter, from zealous vexation at more philanthropic interference. Among the natives on the coast there appears great continuity of general character, aspect, and perhaps language, but the locality of identity or variation remains yet to be ascertained, and a page in the history of man remains yet to be decyphered, containing the narration or conjecture of what has occurred during the long ages in which the presence and the power of the civilized world has been excluded from these regions as rigidly as their shores have formed a barrier to the ocean.

There is great want of a general knowledge of some good system (and there are several published) by which the sounds of one language may be represented by the characters of another. The confusion in the names of people and places in this continent is becoming somewhat puzzling. It is surely advisable to retain the spelling of names which have already been introduced into a known book, and save us the trouble of

identifying such things as Matchappees and Bachapins. Those who are curious however in regard to exactness of sounds ought to ascertain the local extraction and nurture of the writer. A Scottish hand will trace sounds by different marks from those employed by an Englishman, of which there are many instances in Missionary records. An instance of inattention to the powers of a foreign alphabet occurs in the No. III. of the Journal above referred to, where a chief is presented to us as reigning at Mombas under the title of Xeque, this being obviously the Portuguese version of the common Arabic title Sheik; another source of uncertainty is presented in Captain Owen's book, where the Caffer territory is indicated as divided into provinces under titles which are obviously the names of the chiefs lately ruling them, this may perhaps account for the changes of names which in old maps are found sown thickly over the great blank of interior Africa.

ON THE IMPROVEMENT OF FRUITS.

It is or ought to be generally known that we possess a power of varying and improving flowers and fruits, to an extent of which we do not yet see the limits, and in many cases do not understand the causes. Long culture or long subjection to the influence of particular soils, climates, or treatment, probably alters existing qualities to a very considerable degree—thus it is likely that those grapes cultivated in this country, of which the stock came originally from Europe, will present, when compared with European specimens, sufficient differences to be rated as distinct varieties; in the catalogues we have a *white* and *red Constantia* ranked as distinct from others known by the names given to those varieties here, and the Corinthian grape or currant may have thus lost many of the properties of those cultivated in the Grecian Isles, though originally the same. Sowing the seeds of cultivated fruits will generally produce new varieties, and out of a very great number it may be found that one or two are valuable. But there are means by which this end may be attained with much greater accuracy, and by following and modifying them, the creation of new fruits has become a regular and successful pursuit. Considerable attention must be paid to the nurture of the fruit from which the seeds are procured. It should be taken from the healthiest plants, and in the most favourable situations; the nutritive powers of the tree should be fully directed to the developement of the fruit by permitting only a very few specimens to remain on the plant; and the ripening process should be permitted to

proceed to the fullest extent. When, for instance, the seeds of grapes are to be sown, the berries should remain on the vine till almost in a state of decay; they should then be separated from the pulp, and kept to be sown in spring. But of all methods of varying the produce of plants, the most important and the surest, consist of operations upon the blossom. By such means are produced *hybrid* varieties, in which the qualities are compounded of, or intermediate between, those of the sorts from which they are derived. The operation requires a little attention and delicacy but possesses considerable certainty; and it is remarked by the European Horticulturist, that "the raising of new vines is by no means a tedious process; the fruit of the seedling may in general be tasted in the fourth year." The process consists simply in cutting off the stamens of a blossom intended to produce seeds, and applying upon it the pollen or staminal dust of another blossom. Thus perhaps the peculiar properties of the Hannavoet (Royal Muscadine?) which render it proper for making raisins, might be implanted in other varieties;—and perhaps the properties of the *currant* might be transferred to others of higher flavour. The process is interesting, and is likely to be not unprofitable. In regard to the means by which fecundation is produced, the following general results are found in a paper read before the French Academy of Sciences, in September last:

1. Mixing the pollen with water and applying the fluid to the pistils of the blossom seldom succeeds: thus, abundant rains render blossoms unfruitful.

2. Fecundation is not certain if the blossom affording pollen be only made to open naturally or remain naturally expanded beside the other. There must be one cause operating to detach the pollen and another to convey it.

3. Fecundation is uncertain when the flower affording pollen is fading.

4. The produce of fecundation has a direct ratio to the abundance of the pollen.

5. Hybridation is more difficult in proportion to the difference between the varieties which it is desired to combine.

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 256.

* *Aquila coronata.* Crested, crest white with some brown variegation towards shafts of feathers; head, neck, breast, belly, under tail coverts, and legs, white, the latter blotched particularly on outer-sides with black-brown. Back of the neck faintly spotted in some specimens with brown, and the under tail coverts obscurely banded with the same colour; back brown-grey, the feathers margined with white; upper tail coverts white, broadly banded with brownish black; shoulders dull brown, all the feathers margined with white and most of them blackish towards shafts; scapulars grey-brown, margined with white. Primary wing coverts black, margined with white; primary quill feathers dull brown, banded with black, the tips black; secondary quill feathers dusky grey, banded with black, tips white; the inner surfaces of wings principally white. Tail black with three or four hoary grey bands, tips of all the feathers white. Bill black, base of lower mandible yellow; toes yellow; claws black. Length of male thirty-three inches, of female thirty-seven inches.

Young.—Above black clouded with brown; upper tail coverts tipt with white; beneath variegated freely with pale rufous, in somewhat transverse bands on breast and belly; legs white, closely spotted with black; tail black, with two broad hoary bands, and the tips of feathers tawny white. Crest black, the feathers tawny towards quills.

Inhabits South Africa and Guinea.

Crowned Eagle, Edwards, *pl.* 224.

Obs. This species has generally been confounded with the last; it is, however, perfectly distinct. In the *Bellicosa* the wings are longer, the tail has a much greater number of bands, and no crest exists either in young or old specimens. In the present species the head is much smaller and rounder than in the last, the base of the lower mandible is, at all ages, of a yellow colour; and when the wings are folded the points of the primary feathers scarcely reach beyond those of the secondaries.

Genus Haliaetus. *Savigny.*

Bill strong, convex above and hooked at the point; nostrils lunated, transverse; cere hairy; tarsi half-feathered, scutellated before, reticulated behind; tail rounded or cuneform.

* *Haliaëtus blagrus.* Bill brownish; eyes deep brown; head, neck, breast, belly, and thighs, satin white, with the feathers of the head and back of the neck edged with brown. Scapulars and secondary wing coverts light greyish brown; tail the same, with the exception of the tip which is white. Primary wing

feathers blackish; outer vanes of secondaries like the scapulars; legs and feet yellowish; claws black. Length about two feet.

Inhabits South Africa,—very rare.

Falco blagrus, Shaw, *Zool.* Le Blagre, Le Vaill. *Afriq. pl. 5.*

· *Haliaëtus vocifer.* Bill black; cere, and space between it and eyes yellow, and thinly covered with black hair; "eyes reddish brown." Head, neck, interscapulars, anterior part of back, and breast, pure white; the feathers of the head, back of neck, and interscapulars, with their shafts, brownish red; belly and thighs deep chesnut. Primary and secondary wing coverts, as well as primary and secondary wing feathers, deep shining black; tail slightly rounded, and pure white; legs and toes deep yellow; claws black. Length from bill to root of tail twenty-five inches; length of latter eight inches.

Young.—Brown above, white beneath, variegated more or less with longitudinal brownish black stripes or blotches.

Inhabits South Africa,—along the coasts and near the mouths of rivers.

Falco vocifer, Shaw. Le Vocifer, Le Vaill. *pl.* 4.

· Genus Helotarsus. *Smith.*

Bill robust, compressed, curved from the base, and strongly hooked; cere smooth; lores hairy; nostrils semilunar, vertical. Tarsi robust, short, covered with feathers below the joint, the bare portion with rough elevated scales; toes scutellated towards claws. Tail even, and shorter than the wings; second quill feather the longest. Form robust.

· *Helotarsus typicus.* Tip of bill black; base and the cere orange; eyes deep red; head, neck, and under parts, clear black; interscapulars, back, and tail, clear deep chesnut; shoulders greyish brown; primary and secondary wing coverts black; primary wing feathers with both vanes grey, and the inner ones edged near quills with white; secondaries cinerous grey, with the inner vanes edged with white; and each feather broadly tipt with fine shining black; scapulars black; tail slightly rounded, and the wings, when folded, about three inches longer than it. Tarsi reddish, more or less inclined to orange; toes similarly coloured; claws black. Length from bill to base of tail seventeen inches; length of latter five inches and a half.

Young.—Cere bluish; bill horn-coloured; feet and tarsi yellowish; plumage brown, lightest on the head and neck, most of the feathers with the edges and tips of a fainter hue; primary and secondary wing feathers blackish, tinged with grey; tail blackish brown; claws black.

Inhabits South Africa and Senegal.

Falco ecaudatus, Shaw, *Zool.* Terathopius ecaudatus, Lesson. Le Bateleur, Le Vaill. *pl.* 7 & 8.

Genus Circaetus. *Vieillot.*

Bill strong, straight at the base, convex, compressed, and hooked at the point, edges nearly straight; cere hairy; nostrils roundish; tarsi moderate, elongated, naked, and reticulated; toes short; wings as long as the tail; the latter graduated, cuneform, and consisting of twelve feathers.

· *Circaëtus cinereus*, Vieill. General colour dull grey, verging in some places to rufous. Primary quill feathers black; tail above, brown with five white transverse bands; beneath, grey with the same number of pure white bands; tarsi and toes yellowish black. Length nearly twenty-two inches.

Inhabits Senegal.

· *Circaëtus thoracinus*, Cuv. Bill dark horn-coloured; eyes fine yellow; head, together with the back and sides of neck, blackish brown, the former often with a slight tinge of grey; interscapulars, back, tail coverts, and shoulders, blackish brown, each feather more or less distinctly tipt with a dusky or pure white; throat variegated black and white; breast pure black or brownish black; belly, under tail coverts, and thighs, pure white. Primary quill feathers black, with the exception of the greater portion of the inner vane of each, towards its base, which is white; secondaries marked by transverse black and greyish, or greyish white bands, and distinctly tipt with white. Tail nearly even and composed of twelve feathers, each of which has, or may be said to have, white, or grey and white as the ground colour, and is crossed more or less completely by three broad black bands. When the two colours first mentioned occur in the same specimen, the grey occupies only the outer vanes towards the tips, and sometimes a little of the inner ones near the shafts, whilst the white appears in all other situations. When viewed below the whole ground colour appears a pure white, and the three transverse bands a dusky black. Legs and toes livid white, with a tint of greenish; claws black. Length from bill to base of tail fourteen inches; length of tail nine inches and a half.

Young.—Dull earthy brown; second year, brownish above, and white mottled with black blotches beneath; throat and anterior portion of breast black.

Inhabits South Africa.

Circaëtus pectoralis, Smith. *South African Quarterly Journal, vol.* i.

· *Circaëtus Bacha.* Head above black; hindhead with a transverse crest, the feathers white towards their bases, elsewhere black; back dull earthy brown; upper tail coverts sprinkled with white spots: shoulders blackish brown, sprinkled with white spots; quill feathers black, tipt with white, the primaries with a broad band of greyish brown towards points, the inner vanes towards quills white, undulated with black. Sides of neck, and throat, brown or brown-black; under parts dull brown, freely mottled with white spots; under tail coverts brown, banded with white. Tail rounded, black, and crossed towards point by a broad grey-white band clouded with dusky; all the feathers finely tipt with white. Bill lead-coloured; lower mandible towards base, and the naked space round eyes, yellow. Tarsi and toes yellowish; claws black. Eyes deep brown-red. Length of the male twenty-three inches, of the female twenty-eight inches.

Inhabits South Africa, Java, and India.

Falco Bacha, Daud. *Orn.* Le Bacha, Le Vaill. *pl.* 15.

Obs. When I classed this bird some time ago in the genus Cymindis, I had not an opportunity of examining its characters, but was guided entirely by the example of Mr. Stephens. Since that I have met with several specimens, and have satisfied myself that it is closely allied to the *Circaëti,* and more entitled to be ranked in that genus than in *Buteo.* The reticulated tarsi and its general form bespeak the affinity.

Genus Morphnus. *Cuvier.*

Bill large, almost straight, convex above and curved at the point; nostrils elliptical; tarsi slender, long, naked, and scutellated, or covered to the toes; wings shorter than the tail; fourth quill feather the longest.

· *Morphnus albescens.* Bill lead-coloured; eyes fine yellow; head with a small crest; the whole plumage white, clouded with blackish brown upon the mantle, and soft to the touch. Tail rayed transversely black and white; primary wing feathers with the outer vanes brownish, and the inner ones rayed; claws a leaden colour. Length about two feet six or eight inches.

Young.—Brown more abundant in the plumage; all the shoulder feathers edged with rufous.

Inhabits South Africa,—Autenaqualand.

Falco albescens, Shaw, *Zool. vol.* vii. *p.* 93. Le Blanchard, Le Vaill. *Ois. Afriq. pl.* 3.

· *Morphnus occipitalis.* Above blackish brown, inclining to black, in old individuals; below the same colour, only of a darker tint; head and crest blacker than the other parts; the latter composed of several feathers, most of them of different lengths, the longest between five and six inches. Primary and

secondary wing coverts blackish brown, with more or less of the inner vane of each feather white; primary wing feathers white towards quills, blackish brown elsewhere; in the outermost ones the white occurs only upon the inner vanes, in the next to them it occupies both vanes, and in the still more internal, the white is crossed by black bands; outer vanes of secondaries an uniform dusky brown, inner ones brown and dusky or pure white in alternate transverse bands. Tail slightly rounded, each feather marked with white; greyish white, or reddish white and black alternate bands; the number of the first description is usually three, besides some irregular ones or only spots towards quills; the bands seldom extend completely across, but have the extremities on each side commonly margined with the same black as the other bands, and between the last light-coloured one, and the tip nearly two inches of uniform black; bill and claws black; cere and toes yellowish. Length from bill to base of tail nineteen inches; length of latter nine inches.

Young.—Plumage brown, feathers margined with rufous.

Inhabits Africa.

Falco occipitalis, Daudin, *Ois.* ii. *p.* 40. Shaw, vii. *p.* 59. Nisser Tokoor, Bruce. Le Huppard, Le Vaill. *Ois. Afr. pl.* 2. Kuifkop Valk *of the Colonists.*

Genus Polyboroides. *Smith.**

Bill compressed particularly towards culmen, slightly arched from base, moderately hooked at the point; nostrils longitudinal, linear; cere smooth; sides of head to some distance behind eyes bare. Tarsi long, slender, laterally compressed and reticulated; toes long and slender, the middle one connected to the outer by a slight web at base; claws long, slender, and much curved. Wings nearly as long as tail; the fourth and fifth feathers the longest.

Polyboroides typicus, Smith. ♂ Head, neck, and breast, dark blue-grey; back scapulars and shoulders light grey, variegated with very fine undulating dull white lines; hinder portion of back, upper and under tail coverts, belly, thighs, and insides of shoulders, white, with fine transverse black lines; interscapulars, each with a black blotch near its point. Primary wing coverts dark grey tipt with white, and with a broad black band near the point. Primary wing feathers black, the outer vanes towards quills grey, the inner ones white, undulated with black, tips white. Tail dark green-black, crossed by a distinct broad white band, finely undulated with black near the extremity, and by some irregular ones toward the base; the tips of all the

* South African Quarterly Journal, March 1830.

feathers white. Bill dark horn-coloured; cere and base of lower mandible yellow; tarsi and toes yellow-brown; claws black. Length two feet four inches.

Inhabits South Africa and Madagascar.

Falco gymnogenys, Temm, *pl.* 307. Gymnogenys Madagascariensis, Lesson.

Obs. Two specimens from Madagascar which I have examined, differed only from the South African one in my possession, by being smaller and of a lighter colour. They were probably male birds, and mine is a female.

Fam. ACCIPITRINA.

Bill convex, curved from the base, hooked, upper mandible with a more or less distinct festoon on its edge, lower mandible shorter and obtuse; nostrils almost oval; tarsi nearly or completely naked, slender; claws large, very sharp; wings shorter than the tail, fourth quill feather the longest.

Genus Accipiter. *Ray.*

Tarsi generally slender, scutellated; body slender; claw of inner toe very strong; nostrils rounded, transverse; wings extend a little beyond the base of tail, the latter rounded, graduated or slightly forked.

• *Accipiter monogrammicus*, Lesson. Ashy grey; throat white with a longitudinal black line; belly finely striated with brown; tarsi and cere reddish.

Inhabits Senegal.

Falco monogrammicus, Temm. *pl. col.* 314.

• *Accipiter polyzonus*, Lesson. Bill and cere brown, the base of the lower mandible, and the festoon of upper, yellowish; a narrow space round eyes naked; plumage above an uniform ashy brown; throat whitish, finely rayed transversely with brown; anterior part of neck, breast, and belly, dull white, regularly rayed with transverse brown or pale rufous bars; vent and under tail coverts white, with some fine transverse brown lines; wing feathers light brown, banded with dark brown; inner vanes marked with white towards quills. Tail long, even or slightly forked, beneath ash-white with transverse brown bands, above brown with darker transverse bands, and the inner vanes of central feathers with two or three narrow white bars; the tips of all the feathers white. Tarsi long, and with the toes yellow; claws black. Length sixteen inches and a half.

Inhabits South Africa.

Falco polyzonos. Temm.

· *Accipiter niger.* (Black Sparrow Hawk.) Colour a fine black; the feathers of nape and upper part of neck white at their bases; tail feathers above, each, tinted with three white spots, and beneath, with four pure white spots, which form transverse bands when the tail is spread; the first band towards the root, the next on the second-third of the tail, and the last a little distance from the extremity. Primary quill feathers grey-white with some small black spots variegated with ashy; secondaries black; eyes yellow; cere and feet orange. Length nine inches.

Inhabits Senegal,—very rare.

· *Accipiter Gabar.* Bill dark horn-coloured; cere deep red; eyes light crimson; head, neck, interscapular, back, and shoulders, dirty brownish or reddish grey; chin, throat, sides of neck, and breast, light bluish grey or pale slate colour; belly and thighs banded lightish black and clear white. Primary quill feathers nearly an uniform dark brown on the outer vanes, whilst the inner ones are marked by alternate bands of blackish brown and dirty light white. Tail slightly rounded, feathers brownish black, crossed by three transverse bands, which appear when viewed above, of a pale dusky white or greyish white, and when seen below, of a pure white; the tips of all pure white; legs and toes red; claws horn-coloured. Length from bill to base of tail six inches; length of latter six inches and a quarter.

Young.—Bill nearly as in mature specimens; cere and eyes yellow; head and neck variegated blackish brown and rufous, the latter most abundant on the sides of the last named part; interscapulars and back an uniform dark brown, with the exception of some very slight variegations, occasioned by many of the feathers being indistinctly tipt with rufous; shoulder feathers dark brown, tipt and edged more broadly with light rufous; tail coverts white. Chin, throat, and breast, light rufous, more or less variegated by longitudinal stripes of dark brown or blackish brown; belly and thighs marked by alternate narrow bands of dirty black and pale rufous; primary and secondary quill feathers nearly as in old specimens; tail blackish brown, crossed by four white bands, besides each feather having a white tip and some spots of a like colour near quill; legs and toes yellow; claws horn-coloured.

Inhabits South Africa and Senegal.

Falco Gabar, Daud. Le Gabar, Le Vaill. *pl.* 33.

· *Accipiter Tachiro.* Bill bluish black, with a small yellowish spot on the edge of the tooth of the upper mandible, and another opposite to it, on base of lower; cere yellow; upper

parts dull brown; the feathers of nape all white towards quills; chin and throat pure white; sides of neck white, with narrow transverse brown bands; breast and belly white, banded transversely with brown, the bands few towards the middle, but numerous on the sides; under tail coverts white, irregularly crossed by a few narrow brownish lines; thighs tawny white, with broadish transverse brown bands. Primary wing feathers brown, banded on the inner vanes by black towards their tips, and by black and nearly clear white towards quills; secondaries the same as primaries, with the exception of the white being more abundant on the inner vanes Tail slightly rounded, of a light brown colour, and crossed by four broad blackish bands, the tips of all the feathers more or less white; legs and toes yellow; claws black Length fourteen inches and a half; the female nineteen inches and a half.

Young.—Above brown, feathers edged and tipt with rufous; throat white, with a longitudinal black stripe; under parts white with longitudinal black blotches.

Inhabits South Africa.

Le Tachiro, Le Vaill. *Ois d' Afriq. pl.* 29.

·*Accipiter Francesii.* Head and hinder part of neck blue-grey; back and shoulders dark slate-colour; sides of neck light blue-grey; under parts and insides of shoulders pure white; wing feathers brownish black, inner vanes near quills white with narrow transverse black bands. Tail, above a dark slate colour with a greenish tinge, the lateral feathers of a lighter tint with their inner vanes tinged brown, beneath white, more or fewer of the feathers with five or six transverse black bands on the inner vanes, the outer feather of each side with the bands scarcely perceptible, the tips a dull white. Upper mandible horn-coloured, lightest towards the point; under mandible yellow; legs and toes yellow; claws black. Length from bill to tip of tail eleven inches.

Inhabits Madagascar.

To Lady Frances Cole I am indebted for the only specimen I possess of this apparently undescribed species,—and the name it bears in the South African Museum is an indication of the high respect entertained for Her Ladyship as a well known and zealous Patroness of Science.

·*Accipiter musicus.* Head, neck, and breast, light bluish grey; back and scapulars dark slate-colour; upper tail coverts white; shoulders silvery grey, finely mottled with black. Primary wing converts hoary, inclined to greyish black; secondary coverts white, mottled with narrow tortuous black lines. Primary wing feathers brownish black, variegated on inner vanes towards quills with lines or streaks of white; secondaries pure

white, here and there dotted or finely streaked with black; belly, thighs, and under tail coverts, finely banded black and white. Tail slightly rounded, the two centre feathers blackish grey, the rest blackish, or blackish grey and white in different proportions, the latter particularly abundant in the two outermost ones of each side, all, with the exception of the two middle ones, broadly tipt with white. Upper and lower mandibles at base orange-coloured, elsewhere black. Cere, tarsi, and toes, red; claws black. Length twenty inches.

Young.—Bill blackish, with a little of the base of each mandible yellow; cere greenish yellow; eyes greyish yellow, inclined to pure yellow; head, neck, and back, brown, the feathers of the two former white towards quills; tail coverts white, with a triangular brown spot near the tip of each; shoulders brown, with the feathers edged and tipt with reddish white; belly, thighs, and under tail coverts, marked with alternate broad irregular brown and white bands. Primary wing coverts brown, tipt with white; primary wing feathers reddish brown, banded with black, the outer vanes tinted with grey; secondaries bluish grey, banded with black, and tipt with white; tail with reddish grey and blackish brown transverse bands, the former four in number; legs and toes somewhat flesh-coloured; claws black.

Inhabits Africa,—common in South Africa.

Falco Musicus, Daud. *Orn. p.* 116. Le Faucon chanteur, Le Vaill. *pl.* 27. Blaauwe Valk *of the Cape Colonists.*

* *Accipiter rufiventris,* Lath. Head, upper part of neck, back, and upper tail coverts, blue-grey or ashy brown; sides of neck, throat, breast, anterior parts of belly and thighs, light rufous; hinder part of belly, vent, and under tail coverts, pure white. Wing feathers dirty brown, the inner vanes banded with black and blotched towards quills with white. Tail above brown-black with four brownish grey transverse bands, beneath white with dark brown bands; tips of all the feathers white. Bill black, the festoon and base of lower mandible yellow; legs, toes, and cere, yellow; claws black. Length of male ten inches, of female fourteen inches.

Young.—Above brown, the feathers of head, neck, and shoulders, margined with rufous; beneath light rufous or rufous-white, variegated with slender longitudinal streaks.

Inhabits South Africa.

* *Accipiter minullus,* Lath. Head, neck, and back, a dark slate colour; upper tail coverts white, spotted or banded with black. Chin and throat white, finely mottled or indistinctly rayed with black; sides of breast and belly rufous, middle of

breast and anterior part of belly, pure white, all rayed transversely with narrow brown-black bands; hinder parts of belly and under tail coverts pure white. Primary wing feathers brownish, the inner vanes with transverse dusky black bands; secondaries brownish, inner vanes edged with white and crossed by black bands. Tail slightly rounded, the outer vanes of feathers brown-black, spotted or irregularly banded with reddish brown; inner vanes black, and partially crossed in three different positions by white; tips of all the feathers white. Bill black; cere, legs, and toes, yellow; claws black. Length of male ten inches, of female twelve inches.

Young.—Above brown, feathers margined with rufous; beneath rufous, blotched or banded transversely with black-brown; throat but slightly spotted.

Inhabits Africa,—forests of South Africa.

Le Minule, Le Vaill. *pl.* 34.

· *Accipiter melanoleucus*, Smith. Above black with a faint tint of brown; below deep black. Primary quill feathers black, the inner vanes towards quills spotted or irregularly banded with white; secondaries dusky brown clouded with black, and the inner vanes spotted with white; scapulars brown with some white blotches on both vanes. Tail slightly rounded, black, with four or five tawny brown bands, the outer feathers more or less blotched with white towards quills, the centre ones without variegations. Bill black, with the festoon and a spot on the lower mandible yellow; legs and toes greenish yellow; claws black. Length about twenty inches.

Middle age.—Above black, beneath white blotched more or less with black.

Young.—Head rufous, longitudinally streaked with brown; back brown, the feathers margined with rufous; under parts rufous, variegated with longitudinal brown stripes. Tail slightly rounded, each feather with four or five transverse black bands, and the spaces between them brown, finely mottled with white; some of the black bands are somewhat arrow-shaped, with their distal edges margined tawny white.

Inhabits South Africa.

Accipiter melanoleucus, Smith, *South African Quarterly Journal, vol.* i. *p.* 229.

Obs. Naturalists who see reason for separating the larger and more robust species from the smaller and more slender ones, would rank this as an *Astur*.

· *Accipiter Madagascariensis*, Verreaux. Above dull brown with an irregular white spot on the nape; below white, finely barred with brown-black; vent and under tail coverts pure

white. Wing feathers brown with transverse black bands, inner vanes towards quills white; insides of shoulders white, barred with black. Tail brown above, ashy white beneath, and both surfaces marked with eight narrow brown-black transverse bands. Length thirteen inches and a half.

Inhabits Madagascar.

Sub-Fam. MILVINA.

Bill moderate, curved from the base; cere naked; nostrils oblique, oval, or ellipitical; tarsi short, slender; toes weak; wings very long; tail slightly or deeply forked or graduated, and composed of twelve feathers.

Genus Milvus. *Cuvier.*

Bill moderately robust; nostrils elliptical, oblique; tarsi short, slender, and scutellated; fourth quill feather the longest. Tail deltoidal forked or graduated; claws robust.

Milvus parasiticus. Bill and cere yellow; eyes dark brown; head and neck pale tawny, each feather with a longitudinal blackish brown streak which includes the shaft; interscapulars, back, tail coverts, and shoulders, brown, the feathers tipt with a lighter tint; chin and throat streaked longitudinally with brown and dirty white; breast and belly dirty dull rufous, with a narrow stripe of black along the centre of each feather; under tail coverts and thighs rufous; primary and secondary wing coverts blackish brown, with light tips. Primary wing feathers black, mottled slightly with white on inner vanes towards quills; secondaries brown, with the inner vanes crossed by indistinct dusky bands. Tail slightly forked, reddish brown, with eight or nine narrow blackish transverse bands, and the tips of all the feathers reddish white; legs and toes yellow; claws black. Length twenty inches.

Young.—Bill black; colour above dark brown, the feathers tipt with tawny white or pale rufous; beneath brown, feathers tawny white towards tips, shafts black; under tail coverts subrufous.

Inhabits Africa,—common in South Africa.

Le Parasite, Le Vaill. *Ois. Afriq, pl.* 22. Kucken-duif *of the Cape Colonists.*

Genus Elanus. *Savigny.*

Tarsi short, reticulated, and half-covered with feathers below the knees; wings long; tail slightly forked or moderately graduated.

Elanus Cæsius, Savig. Bill black; cere yellow; eyes red; front and eyebrows white; crown and back of neck light

bluish grey; interscapulars, back, rump, and scapulars, bluish grey; shoulders jet black; chin, throat, breast, belly, vent, and inside of wings, pure white. Primary and secondary wing coverts bluish grey, with the edges of inner vanes white, and some of the feathers distinctly tipt with that colour; primary quill feathers hoary grey, shaded towards tips with reddish brown; secondaries bluish grey. Tail slightly forked, pale bluish white; shafts dark reddish brown; legs and toes yellow; claws black. Length eleven inches.

Young.—Bill black; base of under mandible, and the part of the upper one adjoining it, yellowish; front reddish white; crown and back of neck dusky, slightly variegated with very fine reddish tawny streaks; interscapulars dirty blackish blue, with fine reddish white tips; back uniform dusky blue; scapulars dirty blackish blue, with a tinge of brown, and all broadly tipt with dull white; shoulders black, many of the feathers faintly tipt with white. Primary and secondary wing coverts bluish grey, many of them with white tips; primary wing feathers blackish blue with white tips; secondaries with reddish white tips. Chin and throat white; breast and belly pale tawny or dull reddish white; thighs white. Tail a pale dusky blue with shades of brown; part of edges of inner vanes white; tips of feathers white or tawny; legs and toes yellow; claws black.

Inhabits South Africa.

Elanus Melanopterus, Leach. Falco melanopterus, Daud. *Orn.* Le Blac, Le Vaill. *Ois. d'Afriq. &c.* 36 & 37.

Genus Nauclerus. *Vigors.*

Bill weak, compressed; nostrils sub-oval, oblique; wings long, second and third quills longest; tail long and deeply forked; tarsi short, weak, and reticulated; feathered below the knees.

* *Nauclerus Riocourii*, Vigors. Body above ashy grey; below pure white; a white stripe on the forehead; a line before and behind the eye black. Tail grey; bill black; cere and tarsi yellow; second quill feather the longest. Length fourteen inches and a half.

Inhabits Senegal.

Elanoides Riocurii, Vieill.

Sub-Fam. BUTEONINA.

Bill curved from the base, the edges entire; tarsi naked or covered with feathers; wings almost as long as the tail; figure rather robust.

Genus Pernis. *Cuvier.*

Bill curved from the base, edges sharp, culmen nearly sharp; tarsi short, moderately strong, reticulated, and with scutæ on the toes; space between angle of mouth and eye covered with feathers like scales; nostrils, oblique narrow slits at the anterior edges of cere; tail and wings long; tarsi half covered with feathers below the knees.

Pernis Madagascariensis, Smith.* Above, dark brown of various tints, the feathers of the head more or less distinctly margined with rufous; beneath, dull brown dashed with white, particularly on the throat and the breast; most of the feathers on belly narrowly tipt with white; hinder part of belly, vent, under tail coverts, and legs, white; some brown spots on the outer sides of thighs. Quill feathers light brown, transversely banded with dark brown, and the inner vanes towards quills crossed with white; the tips of most of them dull white. Tail above dark brown; towards base banded with white, towards tip with brown grey, the tips themselves white; beneath, white crossed with about four dark brown bands. Bill dark horn-coloured; lower mandible yellow towards base; naked portion of tarsi and toes yellow; claws dark horn-coloured. Length eighteen inches.

Young.—Above, light brown; the feathers, particularly those of the shoulders, tipt with rufous white; beneath, fulvous dashed with white, and the feathers of breast and belly tipt with white.

Inhabits Madagascar.

Obs. Most of the feathers of head, neck, and body, pure white towards quills.

Genus Buteo. *Bechst.*

Bill curved from the base; edges a little waved, culmen rounded; angle of mouth under the eyes; spaces between nostrils and eyes covered with hair; nostrils irregularly rounded, naked and open; tarsi robust, scutellated before, reticulated behind; tail slightly rounded.

Buteo Jackal. Bill black with the exception of a little of the lower mandible at its base, which, and the cere, are dull yellow; eyes dark brown; head, neck, back, shoulders, chin, and throat, black or blackish brown; breast deep chesnut or ferruginous red; belly, under tail coverts, and thighs, black; all the feathers broadly tipt with white or ferruginous red. Primary wing feathers black, with a tint of hoary upon the

* This species has not the scale-like feathers of *Pernis*, but in other respects it exhibits most of the characters of the genus.

outer vanes, and the inner ones towards quills broadly edged with, if not altogether, white; secondaries bluish grey, with many transverse narrow black bands, the very tips of some of the feathers are white. Tail short, nearly even, and deep chesnut or ferruginous red, each feather marked by a black blotch close to tip, and all, more or less mottled with white towards quills; legs and toes dull yellow; claws dark horn-coloured. Length from bill to base of tail twelve inches; length of latter eight inches.

Young.—Above dull brown, most of the feathers edged with tawny; beneath, pale fulvous; the throat and sides of neck with longitudinal black blotches; tail grey-brown banded with black.

Inhabits South Africa,—very common.

Falco Jackal, Shaw. *Zool.* vii. *p.* 173. Le Runoir, Le Vaill. *Ois. Afriq. pl.* 16. Jackal-vogel *of the Cape Colonists.*

Obs. The plumage of this species is subject to endless variety.

Buteo tachardus. Bill black, with the base of lower mandible, and a small portion of the upper adjoining it, yellow; cere yellow; eyes brown. Head, neck, back, and rump, brown, with the edges and tips of the feathers rufous, and the bases of many of them, particularly on the head and neck, white; many of those of neck, back, and shoulders, clouded, spotted, or crossed by irregular white streaks. Under parts white, the throat streaked with longitudinal brown lines; the breast and posterior part of belly more or less spotted with oblong or roundish brown blotches; centre of belly white; thighs reddish brown. Primary quill feathers black, the inner vanes towards quills white; secondaries brown, with irregular transverse blackish bands, the edges of the inner vanes white. Tail moderately long, slightly rounded, of a greyish or rufous colour, with ten or more narrow waved transverse blackish brown bands; tip of each feather dirty reddish white. Legs and toes greenish yellow; claws black. Length eighteen inches.

Young.—Above brown, verging towards blackish brown; below brown-red or dull rufous, the shafts of the feathers black; chin with a slight mottling of white. Tail feathers greyish, on outer vanes, crossed by many waved or oblique narrow blackish bands; on inner vanes reddish white, or reddish brown, with similar black bands; tips of all the feathers dirty reddish yellow. Legs and toes greenish yellow; claws black.

Inhabits South Africa.

Falco tachardus, Daud. Le Tachard, Le Vaill. *Ois. d' Afriq. pl.* 19.

Buteo desertorum. Bill and cere yellow; eyes red; head, neck, back, and belly, ferruginous red; the latter with dashes of black; throat, breast, and under tail coverts greyish white. Primary quill feathers black. Tail ferruginous red above; greyish white with indistinct transverse bands, beneath. Legs and toes yellow; claws black. Smaller than *Buteo Jackal.*

Inhabits South Africa,—*rare.*

Falco desertorum, Daud. Shaw, Lath. Le Rougri, Le Vaill. *Ois. d' Afriq. pl.* 17.

Genus Butaetes. *Lesson.*

Bill slender, arched from the base; nostrils oblique; wings nearly as long as the tail, fourth feather the longest; tarsi feathered to the toes.

Butaetus buteo, Lesson. Over each eye a narrow black stripe; head, neck, breast, anterior part of belly, and legs, white, with longitudinal brown stripes, largest on the sides of breast and belly; interscapulars, scapulars, and shoulders, brown, margined with rufous or white; back nearly an uniform brown; upper tail coverts white, dashed with brown; centre of belly and flanks dark brown, variegated with rufous or tawny white; hinder portion of belly and under tail coverts an uniform dull white. Primary wing feathers brown, both vanes towards quills white; secondaries brown, inner vanes white towards quills; all the feathers obscurely tipt with dusky white. Tail white towards base, grey-brown towards extremity, with an indistinct dark band immediately behind the tip, which is dull white. Bill dark horn-colour; the base of lower mandible, cere, and toes, yellow; claws black.

Inhabits South Africa and Europe.

Falco lagopus, Gmel. Buse Gantée, Le Vaill. *Ois. d'Afriq. pl.* 18.

Butaetes Lessonii, Smith. Above brown, the shoulder feathers margined with brown-white; ears and space behind base of lower mandible brown-black; under parts white; the breast and anterior part of belly streaked with brown-black. Primary wing feathers black-brown, the inner vanes towards quills white, secondaries with blackish transverse bands on inner vanes, and all tipt with white; insides of shoulders white, spotted with black. Tail nearly even, the feathers black-brown, variegated with narrow waved irregular bars of a darker tint, and all tipt with obscure white. Bill bluish black; cere and toes yellow. Length eighteen inches.

Young.—Cere and toes greenish yellow; head and back of neck light brown, feathers margined with rufous; interscapu-

lars and back dark brown; throat, breast, and belly, tawny white, more or less variegated with longitudinal brown streaks.

Inhabits South Africa,—near Heer-logement.

Morphnus dubius, Smith. *South African Quarterly Journal, vol.* i. *p.* 117.

Genus Circus. *Bechst.*

Bill moderately compressed; spaces between eyes and nostrils covered with rigid hair; nostrils oblong-rounded; a colleret of rigid feathers in a half-circle between the chin and the ears, formed by the auricular feathers. Tarsi long, slender, scutellated before, reticulated behind; claws moderate. Tail rounded and broad.

Circus gallinarius, Shaw. *Male,*—Head, neck, back, wings, and rump, bluish-grey; wing feathers white at their bases, elsewhere black; insides of shoulders, rump, belly, flanks, thighs, and tail beneath, white; tail above ashy grey, tips of feathers white; eyes yellow. Length one foot seven inches.

Female.—Upper parts dull brown; the feathers of head, neck, and anterior part of back, bordered with rufous; beneath yellow-rufous, variegated with large longitudinal brown spots; outer vanes of wing feathers rayed dark brown and black, inner ones black and white; rump white; the two middle tail-feathers rayed black and deep ash, the lateral ones rufous-yellow and black.

Young,—Similar to the female, and the male of the first and second year.

Inhabits Egypt, Europe, and America.

L'Oiseau Saint-Martin, Buff. Falco Gallinarius, Lin. Falco Pygargus, Gmel.

Circus melanoleucus. Head, neck, back, rump, shoulders, and upper parts of breast, deep black; under parts pure white. Primary quill feathers black, secondaries and wing coverts cinerious, variegated with black spots or imperfect bands. Tail above, hoary grey, irregularly spotted with brown; beneath white. Bill black, with a yellowish spot on each mandible towards base; cere, tarsi, and toes, yellow; claws black. Length twenty-two inches.

Female.—Grey-white dashed with black.

Young.—Brown-black above; white beneath, dashed with longitudinal brown-black streaks.

Inhabits South Africa and India.

Falco melanoleucus, Gmel. Lath. Faucon a collier des Indes, Sonnerat, *Itin, t.* ii. *p.* 182. Le Tchong, Le Vaill. *Afriq. pl.* 32.

(To be continued.)

SOUTH AFRICAN
QUARTERLY JOURNAL.
SECOND SERIES.

No. 4. JULY—SEPTEMBER, 1834. **Part 1.**

ANNUAL REPORT

Of the Council of the South African Literary and Scientific Institution, for 1833—34, *read at the General Meeting on the 2nd of August.*

On account of the departure of Dr. Smith, one of our Secretaries, close upon the period fixed by the Regulations for convening the Annual General Meeting of this Institution, and on account of the leisure and attention of many members of the Council being occupied in preparations of various kinds for that event, it has been found necessary to defer convoking the members till this day. The Council requesting the indulgence of the members for this deviation from its rules, would respectfully submit to them, as the Report of the Institution, the following review of the few transactions in which it has been engaged during the past year:

First, As to the business, generally, of the Institution, and its present condition and prospects:—The Council has to remark, that during the year now elapsed an attempt was again made to increase the attendance of members at the Monthly Meetings of the Institution, by changing the hour, but that no perceptible advantage has attended it.

The Institution has always contemplated a two-fold purpose, both capable of exerting extended influence on the condition and progress of society. The first of these is the gathering and spreading of information, and aiding or fostering the facilities by which it may be acquired and rendered useful. To this purpose, especially, is the system of public meetings at stated times applicable and subservient, either by attracting information from those of the surrounding community, who possess it, or by the increase or confirmation of individual knowledge, which arises from mutual communication. Its fulfilment depends evidently on the activity, zeal, and power, and the facility of research possessed by individuals, and must vary with the number of those who are thus equipped for unveiling the mysteries of science, or rising to the triumphs of literary success.

The number of such forms a small proportion in any community, and even those which are rich in these species of intellectual wealth, find that the regular drain of periodical meetings, notwithstanding the excitement which they produce in localities favouring it, tends constantly to exhaust their resources and produce intervals of greater or less insipidity and torpor in their procedure. It cannot therefore fail to happen, that in so limited a community as is ours, and in a place where facilities for observation are so few, an institution depending only on its own stores or sources of information, will be unable to sustain the interest which novelty or discovery might be expected to impart to its proceedings.

The amount also which any public organ is at any time able to pour into the general stream of the world's information, depends considerably on the period of its history. Where habits of observation or inquiry are regularly exercised and promoted among a sufficient number of inquirers, there will consequently be a regular flow of contributions to the common stock of knowledge, varying little in rapidity or measure; and even when these habits are only occasionally exercised, as is the case with the vast majority of inquirers, the number of such may compensate for individual irregularity. But at the period when society first begins to require such institutions, we cannot expect either such perfection of habit, or compensating influence of number. The observers will at first be few, and their observations will be only of a desultory character, and though facts which strike the attention of men are ever emerging from the repositories of nature, and occurrences flow forth from among the contingencies of coming time which urge and exercise their meditations, and there may be thus a mustering throughout society of observations which it longs to disclose, and mysteries which it seeks aid to fathom, yet will the formation of a new channel to receive and diffuse these scattered notices tend at once to exhaust the store. Thus a new society or a new journal cannot judge of the facilities for its future continuance from the fruitful indication of its earlier days, for, in correspondence with the extent and activity of the community submitted to its agency, a longer or shorter period inevitably drains away the material by which it is supported. Such being the inevitable influence of time on the internal resources of our Institution, the Council cannot at this period of its existence offer much which is novel in the operations of the past year. Things however have occurred of exceeding interest, and details have been presented which should be expected to awaken the attention of every liberal or philanthropic mind, but the auditors convened to receive them were seldom more than the Council themselves; and there has thus been passing over all its agency the discouragement of neglect

on the part of a great majority of its members. We are not confined moreover to the resources furnished by its members, but having undertaken the purpose of collecting and diffusing information, there is open to us whatever is elicited by the struggling and emulative intellect of civilized nations. The correspondence of the Institution itself affords matter of considerable value, and the journals which are accessible here enable us to keep within distinct vision the whole advancing outline of human progress; but from the indications of past years it would seem that the present arrangements of the Institution do not suit the state of the community in which it seeks to act. The Council is at a loss to indicate a remedy. Perhaps the regulation enjoining monthly meetings may advantageously be altered or provisionally suspended, for it is in vain to expect that any agency will continue to make preparation for an event of which the occurrence is, to say the least, so very problematical as is the attendance generally of members at a monthly meeting. No one can in reason suppose that the Council, as acting for the Institution and representing the members, are to care much about matters for which their constituents care little.

The second object of the Association offers a more encouraging result. The MUSEUM continues its progress of augmentation, both by extensive donations from Members, and by the funds at the disposal of the Council; and as far as the Council can ascertain, the number of members frequenting it, or of strangers coming to examine it, is considerable.

The Council thought it advisable, for a special purpose to be described afterwards, that the S. A. Quarterly Journal should be revived in an altered form, and one year of it has nearly been completed.

The transactions of the Institution during the past year have been of the following tenor:

1. IN REGARD TO NATURAL HISTORY:

Dr. SMITH proposed, and has partly carried into effect, the preparation of a Synopsis of the Zoology of Africa. His absence in charge of the Expedition proceeding into the central regions of the Continent, has necessarily interrupted this undertaking, but the material left by him will serve to complete the Journal for the present year. The Council recommends that measures for continuing that work thus far, be kept in view These outlines of Zoology cannot fail to be of high interest everywhere, from the number of species contained in them which are now first described, and from the light they throw on the general arrangements of that science: but in this country especially ought they to be prized, for if ever that science, which is among the most useful, be studied by colonial inquirers, or whenever the population comes, as it is to be

hoped it will, to feel the importance of knowing the nature of living objects, it is upon the native zoology that all inquiries must first be directed. The principles of connexion and arrangement must be illustrated by what is at hand, and systematic works of a local character serve to the Natural History of a country the same office as grammars do to its language. The same naturalist also took the opportunity on various occasions, at Monthly Meetings, of noticing and exhibiting the various species which had come into his possession.

He had also kindly undertaken to draw up a Catalogue of the objects in the Museum, but want of leisure rendered it necessary to postpone its execution. The systematic work above alluded to will however, in some measure, supply the want of one, as far as relates to the Zoological department; and the Council contemplating its probable use in this respect, combined with its intrinsic value, have procured a small number of copies, which have been so arranged and thrown off, as to constitute a work independent of the other matter in the Quarterly Journal.

Mr. Von Ludwig has transmitted a list of plants lately introduced by him, which will be found in the appendix. The list is accompanied by the following note by Mr. Bowie:—

"The shortness of the notice which called for the accompanying list, must apologise for the incomplete manner in which it is given; it is, however, necessary to observe, that only one case out of three has been unpacked, and the closeness of the package renders it difficult to get at the tallies, and only such are here enumerated as are in perfect health; it will be gratifying to know that others in addition are, perhaps, ensured to the Colony, as many of the collection are herbaceous, and seeds also are vegetating in the earth which fills the cases.

"It is impossible to refrain from remarking on the importance of this re-migration of plants, natives, of North America, Japan, China, &c. from Europe, to the Cape. Among them are Platanus Orientalis (famous in Grecian History), and Tilia Europœa or Linden, which gave the name to the celebrated family of Linné, &c. &c."

2. Statistics:

No statistical details of any value have come under the notice of the Council, but a system of inquiry of great extent and importance has been under its review, and a Sub-Committee has been entrusted with the revisal of the inquiries formerly proposed by the Literary Society, and the preparation of another set to be printed and circulated, either altogether or in sections, among those persons in the community who are likely to possess or acquire such information. It does not seem that any records of much trust or value exist in the colony, tending to elucidate the great questions respecting the

population, or the medium duration of life in it, so as to mark and determine the influence exercised upon these by the circumstances of the people and by the variations which their condition is rapidly undergoing. It should surely be kept in mind that no statistical experiment of a character more majestic and extensive has perhaps ever been made, than that now proceeding in the British colonies, by the abolition of slavery. It is an effort of political strength, which, for its magnitude and promise of great results, is worthy to consolidate such an empire. It brings all within the compass of one peculiar distinction of lofty moral character and abounding resources; and, as to its many economic results, ought to be studied every where with close and uninterrupted attention. It seems likely to afford an *instantia crucis*, as to some interesting controversies in political economy. No country, perhaps, ever received in so short a period so great an extension of Capital as this Colony is about to experience, and the result therefore cannot fail to have some effect in deciding the celebrated question—whether the profits of capital vary only with its abundance, or have their measure determined by the quality of the land which the circumstances of society retains in cultivation.

It should then throw some light on the influence exercised by change of circumstances, upon the condition and duration of life, upon our knowledge of which, it is now seen, every estimate of the prosperity and strength of a people ought to depend. A nation's resources ought to be estimated not according to the number of people it can muster, but according to the strength of its united mass; and the efficiency of a population arises not from the number of human beings in it, but from the number of beings of matured strength; or their comparative power should be reckoned in some ratio, compounded of their number and the duration of their life; hence the necessity and advantage of accuracy and minuteness in recording the changes which time produces on the numbers ushered into life, and hence is it seen, that a country may advance in population, though the annual number introduced into it be stationary, by the increase of the life of each; and the wealth and comfort of a society may be estimated from the number which remain alive at the maturer years of life.

The result of the great introduction of capital will be also an interesting object of observation; but it is not easy to estimate either the exact kind or amount of its influence. It will affect considerably trade, property, and population. Wealth cannot leave a country except in the shape of the things it contains or produces, and though there may be intermediate exchanges betwixt its transaction of bestowing and the transaction of another in receiving, the end is simply the deposition of property of some sort or other in the object of its bounty. It must be

remembered that money is the instrument and not the object of exchanges, and the possession of it, or of the obligation entitling to it, merely confers on the holder a deliberative power as to the nature of that exchange which he individually desires to encourage or facilitate. The instant, therefore, that the pecuniary obligation betwixt Britain and this country is contracted and ratified, or can be acted on as a certain thing, that instant do the operations of commerce commence, which are to diffuse abroad the resources of the giver and land property of some kind or other, in a tangible and material shape, upon our shores. Much of that which thus reaches us, may afford only the means of augmented comfort or luxury, and extend the present consumption of the community. We may remark, that where immigration is possible, this effect has some influence on population; for it is precisely a superiority in the comparative rates of comfort or luxury offered by different countries, which induces men to leave their homes. It may, however, be inferred, that the greater part of the property transferred, will be of that nature which directly facilitates production, or composes the machinery by which national resources are more extensively worked, and afford a greater amount of net profits, and by this result it is, that the controversy between the theories of Smith and Ricardo will be determined, if, as is more likely, it do not turn out that they are reconcileable, and merely present different views of the same state of things.

3. General Physics.

In consequence of a communication from Mr. Lubbock, the Association adopted the resolution of making a series of observations on the Tides in Table Bay, and a Committee was appointed to consider the proper arrangements for this purpose. From the information received, it does not appear that this would prove expensive, as the machinery requisite is not of a complex character, and the indications would probably be ascertained with considerable ease and correctness from some of the departments whose agents are in constant employment at the landing place. The Association, however, is glad to find that this object has excited the attention of the Astronomer Royal, and that a machine has already been erected in Simon's Bay, and another is preparing for this place, by which the rise and fall, and periods of variation, will be ascertained.

The objects of interest in this case are, first, the correspondence between these oscillations and the movements of the heavenly bodies as to time, and the variations or heights corresponding to the changes of the sun and moon in position, and the mutual relation which the one of these circumstances may have to the other. These require to be disentangled from the effects of local circumstances, which influence both results.

Thus it is asserted, that in narrow parts of the Eastern Seas there is only one tide in the 24 hours, or that one of the undulations becomes extinguished, and that in the Pacific the hour of change is constant. Again, it is remarkable that over the whole South African coast the tides are low, though we have a wide and deep sea around us, while in the northern divisions of the Atlantic and Indian Oceans the tides are of great height; showing that the configuration of the coast, and, perhaps, also of the bottom, has a powerful effect in modifying the general celestial agencies which operate in them.

A proposal was made, and considered, to establish a Meteorological Observatory for a short time, at the main-guard, where, from the constant presence of the military, the observations might be recorded for short intervals,—and by the kindness of the President, then Acting Governor, leave was obtained for having this done at intervals of two hours. The preparations however, which would be needful for having it efficiently and usefully performed, seemed rather beyond the compass of our resources for the time, and it was therefore deferred. A register is now being kept at the Royal Observatory, which will afford the data necessary to determine the character of our climate. There has lately been submitted to the Council, a printed half-sheet containing a plan for marking the changes of weather, &c. by letters, which the Council would recommend to the attention of its members, and would propose to reprint here.

There has also been communicated by Major CLOETE, a MS. Meteorological Journal, kept by Capt. AITCHESON, of the Cape Corps, at the military post Caffers' Drift. It is from 1830 to 1834, with few interruptions, and is filled with an interesting detail of the appearances of the sky, &c. The following abstract accompanies the journal:

The Observations are at 7 A.M.—noon—and 5 P.M.

	1832. Med. Temp.	1833. Med. Temp.	1834. Med. Temp.
January	72°03	73°32	74°33
February	72 54	74 83	74 66
March	70 33	72 30	69 90
April	67 04	66 80	67 04
May	61 54	64 38	64 66
June	57 79	62 29	
July	60 37	62 76	
August	59 09	63 12	
September	64 23	65 63	
October	62 30	65 68	
November	64 58	66 21	
December	65 75	70 00	
Means.	64 80	67 28	

Mean of the two years 66° 04

The Council has before remarked the importance of these observations every where, and especially in our situation. If we conceive a sheet of definite and nearly constant breadth, stretched over and accommodated to the surface of the globe, and extending from our neighbourhood beyond the Equator, we shall represent the space subject to the influence of the trade winds. While its boundaries continue nearly constant, it shifts its position, coming south, and including in it our atmosphere in summer, and departing from us in winter. Hence, obviously, arises the general character of these seasons. It remains to be determined, what are its precise boundaries during different periods of the year, or how far south from us does the trade wind commence in summer, and how far north of us is found its first stir in winter. It cannot be expected its bounds are not accommodated to the parallels of latitude, and to the isothermal parallels, but is likely to bear a closer relationship to the latter. Not only the outline but probably the depth or altitude of the current would present great irregularities, if a section of it, nearly corresponding to the latitude, could be produced: and along the portions where the lower current is thinnest or shallowest, we may expect the returning aerial stream from the Equator running as it were in grooves or channels, and sooner coming to impinge upon the surface of the ground: such streams of the great movement, would evidently bend round to follow and rejoin the South-Easter in its voyage to the Tropic. This is probably the character and course of the South-West winds, which occasionally prevail here at all seasons. Local circumstances also of different characters may occasionally project a portion of one current upon or through the other, and produce variations in duration and intensity in the breeze. Such circumstances may have the effect of not only inclining the direction of the current from its proper angle with the meridian, but also for short spaces may influence its natural parallelism to the surface, as is exemplified in the descending cataract of the South-easter, which sometimes sweeps over and leaves undisturbed the atmosphere of our valley to spend its fury beyond us on the waters of the bay, in such circumstances it will naturally be deflected again partially from the surface, and proceed for a little in a set of diminishing rebounds, rendering its squalls local in their intensity, until friction and mutual pressure quell the disturbance and force it into the common regularity of the trade wind. We have therefore again to observe the advantage of many and separated points of observation, and the benefit which would be answered from having a map of the districts of the winds for one or many successive days, as might be attained through means formerly noticed, in the records kept by the numberless vessels navigating the ocean. A request to this effect as to a period of a week or a month, if issued by such a

body as the British Association for the Advancement of Science, would probably meet with attention from navigators, and lead to valuable results.

It is a common opinion that the state of the weather is influenced by the position of the sun and moon in respect to the earth, and it cannot be doubted, that in regard to this climate the opinion is well founded. We are in the position where a cause acting generally, though not strongly, is most likely to bring its effects to notice. It cannot be doubted that there is at least a half-monthly tide in the atmosphere corresponding to the springs in the oceans, and any hesitation or activity which these accumulations produce in the great currents will be most felt at their boundaries; besides, though the action of the moon may not, as has been calculated, avail to produce a movement of more than a few miles per day in the atmosphere, this may, by the translation of their boundaries and intermingling of currents, produce a total change of weather in the neighbourhood of these limits. If, moreover, this lunar influence should, as may be conceived, exert its action in a direction vertical to, or inclined to, the surface of the earth any where, then a movement of a few miles would produce an inevitable change, for above the summer of every land there lies in the upper regions of its atmosphere all the rigours of a polar winter. It would be of general importance then, and save the trouble of an interesting reference, if meteorological diaries followed the periods of lunations or noted the age or day of the moon, and also the difference betwixt her declination and that of the sun.

5. In regard to Geography:

We had to remark at last Anniversary, the origin in this Association of an enterprise which has excited the highest public interest, and promises very extended advantage. The Central Expedition has now started under Instructions, a copy of which lies on the table. It will be seen from them, that it is proposed to explore minutely the great square space which forms a tantalizing blank on our maps, immediately north of the Gariep, and extending to the regions now or formerly bearing commercial relations with the Portuguese colonies. On this region there obviously rises a sort of ridge or spine which separates the waters falling to the two seas. The descent on the western side, which is chiefly to occupy the attention of the expedition, must be very gradual, but whether it slopes regularly or proceeds on a level to descend rapidly near the western shore, remains to be determined. In either case however, the climate and temperature of the district to be traversed by the expedition must, when compared with the regions on the coasts, be dry and cool. It is to be feared, that

a great part of it is a sterile desert, but in its wide-peopled regions there remains enough to occupy the time and repay the efforts of the expedition. Though the reports of commercial travellers do not suffice to ascertain exactly the boundaries to which their enterprizes have reached, there cannot be a doubt that the neighbourhood of the Tropic has been attained by them without encountering any serious obstacle or peril, and therefore we can have no alarming apprehensions of the hostility of the natives.

Several works have, during the past year, thrown light upon the Geography of this portion of the earth. A work published by Mr. KAY, one of our Correspondents, relates almost solely to the religious and political history of territories which are known with considerable accuracy. The researches of Captain OWEN show, that the regions on the Indian Ocean, north of Cape Corrientes, exhibit an enviable contrast to our shores, in the abundance and security of their bays and harbours. The information communicated however, with regard to the physical condition of the country, or in regard to its natural history or inhabitants, is very scanty, and it is requisite to correct one representation in it, which details that the country called Cafferland is portioned into districts, having the names which are known to be the appellations of Chiefs, some of whom are deceased; and it is the practice of the Amakosae to designate the portions of their territory under the rule of different leaders as the country of the chief.

A beautiful distinct and apparently accurate Map of Southern Africa has been published among those composing the Atlas conducted by the Society for propagating useful Knowledge. But let us remark, that the greater part of the additions to our information presented there, comprising nearly the whole of the important territory east and north of the eastern colonial boundary, is drawn without acknowledgment from a source which the Society was not entitled so to employ. It is a copy of a sketch composed by Mr. CHASE, one of our members, from his own researches, and from documents in his possession.

The same member has afforded a distinct and interesting outline of the progress of discovery around our colonial boundary, which has been published in different numbers of the Quarterly Journal.

5. CORRESPONDENCE:

In addition to its Correspondence with the Natural History Society of Mauritius, the Association has had an opportunity of commencing other arrangements of a similar nature with the Zoological Society of London, which has transmitted for this Institution, a copy of the Monthly Notices of their Proceedings, promising a continuation of these interesting documents, and

requesting that the Institution would correspond with it, which proposal the Council respectfully acknowledged, and ordered, that Notices received respecting that Science, should be transmitted to the Zoological Society.

A similar communication in respect to the Zoological Society of France, has been received and agreed to.

6. As to the Acquisitions of the Association:

It is well known, that the most attractive and valuable portion of the stock of the specimens in our Museum, consists of the private collections of three Members of the Institution, who thus render their private acquisitions a public benefit. But as we are not entitled to expect that this advantage should be other than temporary, the Council has been on the watch for opportunities of increasing the specimens constituting the property of the Association. There remains a considerable number of the birds procured during the preceding year, out of which the Council has been in the practice of withdrawing specimens to be set up for exhibition, according as the state of the funds would admit of it. To this reserved stock a considerable addition was made by the purchase of a collection consisting of 212 specimens, for the sum of £45. Of this collection, however, 188 were transferred to Mr. Verreaux, on the condition that he should stuff and set up 276 skins of corresponding sizes, out of those possessed by the Institution. This bargain is almost completed, and we may therefore reckon that an addition to that amount has been made to the contents of our cases.

The Donations of Individuals have nobly seconded the endeavours of the Council, among which there is most worthy of remark, a collection of 24 specimens of birds from the Himalaya Mountains, containing several of the rarer and more splendid of the species adorning that interesting region; presented by Lady D'Oyly, through Major Cloete. These donations have occurred in the following order:

Books.—A work entitled A Direction to the English Traveller, of date 1643, from Mr. F. S. Watermeyer.—A Dissertation, De Afrorum Veneno Sagittario, from the author G. Krebbs.—The Journal of the Missionary Wolff in Central Asia, from the Hon'ble Lieut.-Col. Wade, President.

From the Zoological Society, a series of the Monthly Notices of their transactions.

Miscellaneous Articles.—A set of the Warlike Weapons of the Kholes, a mountain tribe in the centre of India; from Capt. Hawkins, of the Bengal Army.

Specimens of French Assignats, by Mr. Marquard.

Two old Netherland Dollars, from Mr. Hill, of the Madras Army.

Two Silver Pennies, from Mr. ARROWSMITH, of Cape Town.

Three Plaster-cast Busts, by Mr. VON LUDWIG.

Specimens in Natural History.—A set of Fossils from the coast of Dorsetshire, by Mr. TREDGOLD.

A set of Specimens of the Bonti Bok, shot for the Institution by Mr. VON LUDWIG, under permission from the Hon'ble Lieut.-Col. WADE, then Acting Governor.

A Specimen of the Manis Temminckii, by the Rev. Dr. PHILIP.

A Specimen of a new Boa, from the interior; by the same.

A set of European Birds, from Mr. VON LUDWIG, (accompanied by some seeds of the Sago Palm).

Specimens of Minerals from the Potteberg, near Swellendam, by Major CLOETE.

Specimens of Lava from Tristrao da Cunha, by the same.

Eleven Specimens of Devonshire Marble, from the Rev. Dr. BURROW.

A fine Specimen of Genetta Capensis, from Mr. MILLER, Cape Town.

The Treasurer reports that 70 members are now on the lists, and that the Total Expenditure has been .....£ 144 13 7½
and Income..... 113 5 0
The excess having arisen from an extensive purchase of Birds formerly noticed,—and that the Institution remains indebted the sum of £ 59 : 14 : 4½,—the Arrears due to it amounting to £ 58 : 10s.

LIST OF THE COUNCIL

Elected at the General Meeting on the 2nd August 1834.

PATRONS,

The Hon'ble Sir GALBRAITH LOWRY COLE, G.C.B.
His Excellency Sir BENJAMIN D'URBAN. K.C.B. & K.C.H.

Sir JOHN HERSCHELL, PRESIDENT.

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} SECRETARIES.

APPENDIX.

FIGURES
TO DENOTE THE FORCE OF THE WIND.

0	Calm.	
1	Light Air, - - -	Or just sufficient to give steerage way.
2	Light Breeze, -	Or that which a man-of-war, with all sail set, and clean full, would go in smooth water, from..... 1 to 2 knots.
3	Gentle Breeze, -	3 to 4 knots.
4	Moderate Breeze,	5 to 6 knots.
5	Fresh Breeze, -	Or that to which a well-conditioned man-of-war could just carry in chace, full and by - - - - Royals, &c.
6	Strong Breeze,	Single reefed topsails and top-gallant sails.
7	Moderate Gale,	Triple-reefed topsails, jib, &c.
8	Fresh Gale, - -	Triple-reefed topsails &c.
9	Strong Gale, -	Close-reefed topsails and courses.
10	Whole Gale, -	Or that with which she could scarcely bear close-reefed main-topsail and reefed fore-sail.
11	Storm, - - - -	Or that which would reduce her to storm stay-sails.
12	Hurricane, - -	Or that which no canvass could withstand.

LETTERS
TO DENOTE THE STATE OF THE WEATHER.

b Blue Sky; whether clear or hazy atmosphere.

c Clouds; detached passing clouds.

d Drizzling Rain.

f Foggy—**f** Thick fog.

g Gloomy dark weather.

h HAIL.

l LIGHTNING.

m MISTY hazy atmosphere.

o OVERCAST, or the whole sky covered with thick clouds.

p PASSING temporary SHOWERS.

q SQUALLY.

r RAIN, continued rain.

s SNOW.

t THUNDER.

u UGLY threatening appearances.

v VISIBLE clear atmosphere.

w WET DEW.

· Under any letter, indicates an extraordinary degree.

C· Flosculent clouds, called horses' tails.

Ṫ Table Cloth.

L̇ Cloth on Lion's Head.

L· Cloth on Lion's Rump.

Ḋ Cloth on Devil's Berg.

·D Cloth East side of ditto.

D· Cloth West side of ditto.

— Eastern Hemisphere.

+ Western ditto.

By the combination of these letters, all the ordinary phenomena of the weather may be expressed with facility and brevity. *Examples*:—**Bcm**, Blue sky, with passing clouds, and a hazy atmosphere. **Gy**, Gloomy dark weather, but distant objects remarkably visible. **Qpdlt**, Very hard squalls, with passing showers of drizzle, and accompanied by lightning with very heavy thunder.

List of Plants lately introduced by Mr. VON LUDWIG, *referred to in p.* 292, *(extended.)*

Mespilus sanguinea
——— apiifolia
——— caroliniana
——— coccinea
——— cordata
——— cotoneaster
——— lucida
——— crus-galli splendens
——— cuneifolia
——— elliptica
——— germanica
——— monogynia flor. rubr. pleno.
——— ——— flor. rubro.
——— ——— folia var.
——— nigra
——— Oliveriana
——— orientalis
——— oxycantha flor. rub. splend.
——— ——— flor. rubro.
——— pectinata
——— punctata
——— pubescens
——— pyracantha
——— pyrifolia
——— tanacetifolia
——— xanthocarpa
Morus alba
—— nigra, fruct. max.
—— rubra
—— tartarica
Syringa persica, fol. laciniata
——— vulgaris flor. albo.
——— ——— violacea
——— persica
——— chinensis
——— Josikoa
Æsculus carnea
——— flava
——— hybrida
——— macrostachya
——— nigra
——— Pavia
Æsculus chioensis
——— Hippocastaneum
Alnus glutinosus fol. latior
—— plicata
—— cordifolia
Carpinus Americana
Cercis siliquastrum
—— canadensis
Cornus alba
——— circinata
——— florida
——— mascula
——— alba flor. var.
Corylus arborescens
——— Americana
——— heterophylla
——— avellana, maxima
——— fruct. rubra
——— colurna
——— rostrata
——— avellana, sativa.
——— tubulosa
Cydonica vulgaris maliformis
Juglans cinerea
——— alba
——— cathartica
——— compressa
——— porcina, larga
——— tomentosa
Æsculus pallida
——— rubicunda
Populus cordata nova
——— Hudsoniana
Platanus acerifolius
——— orientalis
——— cuneata
Quercus prinus
——— stellatus
——— rubra
Lonicera tartarica rubra
Clematis Viticilla rubra
Tilia europea
Rosa centifolia clusiana
Azalea tomentosa

Azalea pontica
Rhododendron contortum
——— microphyllum
Sophora Japonica
Prunus mahaleb
Hydrangea nivea
Fagus asplenifolia
—— atropurpurea
Cytisus laburnum pendula
——— quercifolia
Rhus Cotinus
Cupressus disticha
Fraximus chinensis
Ailanthus glandulosus
Betula pubescens
Ulmus pendula
——— gigantea
——— suberosa
Viburnum opulus
——— dentata
——— prunifolia
Castanea vesca
Anona glabra
Ribes aureum
—— nigrum
Rheum Emodi
Hibiscus spectabilis
Daphne Laureola
——— Mezereum
Arum Dracunculus
Periploca græca
Illicium floridanum
Fuschia microphylla
——— gracilis
——— coccinea
Gleditschia triacanthos
——— diversa
Liquidambar styraciflua
Ulmus gigantea
——— suberosa
Vitis vinifera. Blassard Noir.
——— Chasselas de Fontain bleau.

Vitis vinifera. Madeira Noir
——— Perl extra
——— ——— var.
——— ——— one seed
——— Frankendahl I.
——— ——— II.
——— ——— III.
——— Port. new.
——— Malaga
——— Charente (Claret)

Prunus armeniaca (Apricot)
——— domestica (Catherine Plum)
Amydalus communis dulcis
——— persica pleno.
——— pumila pleno.

Pyrus Malus, (Reine Claude)
——— Bordsdorf
——— Permain Royale
——— Pepin le 'grande
——— Reinette d'or tardive
——— Nonpareil
——— Imperial Table
——— Pepin d'or
——— Winter Apple
——— Pepin d'anjou
——— —— d'angleterre
———Passe pome deesse

Pyrus communis. Pears.
great summer bergamotte
Red bergamotte
Cressane
St. Germain
Hordergort's late winter
Beurre blanche
Napoleon's butter pear
Bergamotte puis
Bergamotte from Soulers
Bergamotte von Buys

Total 165 species or varieties.

AFRICAN ZOOLOGY:

By Dr. SMITH.

Continued from page 288.

Circus Acoli. Male.—Bill horn-coloured towards base, bluish black towards tip; cere red; eyes orange-red: colour of plumage above pale bluish grey; beneath whitish, with the breast, belly, and thighs, finely rayed transversely with black; body slender; legs long; tail nearly even, and of a dirty brownish white tint; shafts reddish brown; legs and toes yellowish; claws black.

Inhabits South Africa,—Zwartland, Le Vaillant.

L'Acoli, Le Vaill. *Afriq. pl.* 31.

Circus ranivorus. Bill black, with a shade of yellow on lower mandible near base; eyes and cere yellow; front and crown brown, varied with light rufous; back of neck and interscapulars dirty dark brown, the feathers edged with a pure or reddish white; back and rump brown, feathers with tawny tips; upper tail coverts ferruginous and brown, with whitish tips; shoulders mottled dark blackish brown, ferruginous and pure white; cervical collar blackish brown and white; chin, throat, and breast, dirty brown, the feathers edged and tipt with dirty reddish white. Primary and secondary wing coverts blackish brown, with grey transverse bands; primary quill feathers with the outer vanes marked by alternate transverse bands of deep hoary grey and brownish black; inner ones with a considerable proportion of bluish grey, variegated by transverse partial blackish bands, the inner edges of vanes towards quills, clear white; towards tips the feathers all nearly uniform brownish black; secondaries brown and deep bluish grey, in alternate transverse bands; inner edges of inner vanes white. Tail with five blackish brown, transverse bands, and six bluish grey ones, besides bluish grey tips. Legs and toes yellow; claws black. Length eighteen inches.

Inhabits South Africa.

Falco ranivorus, Daud. Shaw. *Zool.* Le Grenouillard, Le Vaill. *Afriq. pl.* 23.

Circus maurus, Temm. Bill black; the base of lower mandible and the portion of the edge of upper adjoining it, yellow; cere and eyes yellow; head, neck, back, rump, shoulders, and all the under parts, brownish black, verging on pure black; the bases of the feathers of the nape pure white. Outer vanes of primary quill feathers hoary grey; inner vanes towards quills white; elsewhere brown or black; secondaries with the outer

vanes hoary, the inner ones nearly white, and both, towards tips, crossed by a broad blackish band; upper tail coverts white, under ones black, some of them narrowly tipt with white. Tail above black, with four transverse bands of dark bluish grey, and the tips of all the feathers greyish white; the vanes close to quills pure silky white. Legs and toes yellow; claws black. Length from bill to base of tail ten inches; length of latter nine inches and a half.

Young.—Front blackish brown; crown and part of nape light rufous, variegated with brownish black streaks or clouds; back of neck an uniform brownish black, feathers broadly tipt with pale rufous or tawny white; chin, throat, breast, and belly, tawny rufous; the two first with brownish streaks or spots, the third clouded by brownish blotches, and the last slightly marked by longitudinal brown streaks. Quill feathers with the grey less clear, and the tips of the feathers tawny white. Tail blackish brown, with three distinct white transverse bands, and the bases and tips of all the feathers white. Legs and toes dirty yellow.

Inhabits South Africa.

Circus Swainsonii, Smith. Front and eyebrows white; upper parts ashy grey; the tail coverts faintly banded with brown; under parts and insides of shoulders pure white. Primary and secondary wing coverts grey, faintly tipt with white; quill feathers towards points brown black, outer vanes towards quills grey, inner vanes white. Tail rounded, the centre feathers brown-grey with four or five broad, dark brown bands; lateral feathers pale fulvous or tawny white, banded irregularly with dark brown; the tips of all the feathers white. Bill black with a faint yellow mark on the edges of both upper and lower mandible towards base; cere, legs, and toes yellow; claws black. Length seventeen inches and a half.

Young.—Front and eyebrows whitish; top of head and back of neck pale rufous, variegated with longitudinal dark brown stripes; back and shoulders dull brown, the feathers margined with rufous; upper tail coverts white; chin whitish; under parts pale fulvous, darkest on the throat and breast; many of the feathers with a dark rufous brown stripe in the course of the shaft. Outer tail feathers banded pale fulvous and dark brown.

Inhabits South Africa.

Circus superciliaris, Smith. *South African Quarterly Journal, vol. i. p. 385. (the young.)*

Circus Le Vaillantii, Smith. Bill black; base of lower mandible yellow. Front, chin, nape, cervix, and part of breast, white or rufous white; the feathers of the neck and nape each

with a spot of brown at tip; interscapulars and back dirty brown; upper tail coverts brown, with their tips pale tawny; throat, sides of neck, and anterior part of breast, blackish brown; flanks, belly, thighs, and vent, reddish brown, inclined to dirty ferruginous; shoulders variegated brown and pale tawny; inside of wings dark tawny, spotted with brown. Primary and secondary wing coverts brown, with tawny tips; primary quill feathers dark brown, the inner vanes towards quills light tawny, variegated by longitudinal waved dusky lines; secondaries similarly coloured. Tail nearly even, dark brown, with the three outermost feathers of each side distinctly marked by transverse interrupted tawny bands; centre ones with indistinct light coloured bands on inner vanes; tips of all the feathers tawny. Legs and toes greenish yellow; claws black. Length about eighteen inches.

Young.—Plumage an uniform dark brown, very slightly variegated by some streaks of bright tawny about the chin, front, and anterior edges of shoulders. The brown of the upper parts is dark and clear; that of the lower reddish brown or ferruginous. Tail feathers nearly uniform brown, with tawny tips, and some similarly coloured spots towards quills. Bill blackish blue, the lower mandible yellow at base. Legs and toes dirty yellow.

Inhabits South Africa.

Sub-Fam. FALCONINA.

Bill curved from the base, with one or more strong teeth upon the edge of the upper mandible; wings as long or longer than the tail, first feather long, second longest.

Genus Falco. *Bechst.*

Bill strong, conical, curved from the base with a strong tooth on edge of upper mandible, the lower notched near point; nostrils round, situated near anterior edge of cere; tarsi short, more or less robust, their upper third feathered, the rest reticulated. Tail moderately long, slightly graduated, broad, and rounded; hinder toe strong; claws falciform; cere nearly naked.

Falco peregrinus, Lin. Head and upper part of neck bluish black, rest of upper parts ashy blue, the feathers crossed by irregular blackish bands; quill feathers blackish, with a hoary tint on the outer vanes, inner vanes with transverse tawny or white stripes; edges of shoulders white; tail ashy with numerous transverse black bands, broadest towards the tips which are dull white. Beneath each eye a broad black streak;

throat and breast white, the latter with a few longitudinal black striæ; belly dull greyish white with many small irregular-shaped black spots. Eyes brown; bill bluish; base of lower mandible, space round eyes, and the legs, yellow. Length thirteen inches

Young.—Head bluish brown; feathers finely edged and tipt with rufous; nape and back of neck variegated blackish brown and tawny white; back blackish feathers with rufous tips; chin and throat pure white; breast and belly tawny, variegated with oblong blackish spots, largest on the flanks; tail brownish black with seven or eight transverse rufous bands, tips white; legs and toes greenish yellow; claws black.

Inhabits Africa and Europe,—not uncommon in South Africa.

Le Faucon, Buff. *pl. enl. pl.* 421. The Blue-back Falcon, Penn. *Brit. Zool.* Falco Peregrinoides, Smith, *South African Quarterly Journal, vol.* i. *p.* 235. Spervel *of the Cape Colonists.*

Falco biarmicus, Temm. Front and anterior part of crown black, rest of crown and nape rufous; back of neck, interscapulars, back, upper tail coverts, and shoulders, bluish grey, with dark slate coloured transverse bands; from the eye to the nape a black stripe, and another behind the angle of the mouth; sides of neck, and all the under parts, pale tawny-white Bill bluish, the base of the lower mandible yellow; eyes dark brown. Primary and secondary wing coverts hoary blue, with dusky grey-white transverse bands; primary and secondary wing feathers brownish; the inner vanes, for the greater part of their length, partially crossed by somewhat conical white spots. Tail hoary white, with ten or eleven moderately broad, black bands; the intermediate spaces thinly sprinkled with minute brownish black dots or lines; tips of all the feathers white; cere, legs and toes, yellow; claws black. Length of male fifteen inches, of female seventeen inches.

Young —Head rufous, the front and nape variegated with black; back of neck and interscapulars blackish, with the feathers finely tipt with rufous; the black stripes on sides of head less strongly marked than in full-grown specimens. Sides of the neck rufous; chin and throat tawny-white; breast and anterior part of belly pale rufous, with a roundish black blotch towards the middle of each feather; hinder part of belly, under tail coverts, and thighs, pale rufous, without variegations. Primary and secondary wing feathers blackish, with the inner vanes marked by transverse oviform pale tawny spots, all tipt with light rufous. Tail blackish, with seven or eight irregular transverse rufous bands; all the feathers broadly tipt with rufous. Bill bluish green, with shades of black, and the lower mandible with a very faint tinge of greenish yellow at base; cere

dusky greenish yellow; eyes dark brown; legs and toes yellowish white; claws a dark horn-colour.

Inhabits South Africa.

Falco chiqueroides, Smith. *S A. Quarterly Journal, vol.* i. *p.* 233.

Falco concolor, Temm. *Male*,—Bill black; cere and legs yellow; plumage ashy grey; tail finely banded with a paler tint, and each feather slightly rayed longitudinally with a deeper colour than that of the body.

Female,—a dusky lead-colour.

Inhabits Senegal, Barbary, Egypt, and Arabia.

Falco rupicolus, Daudin. Bill bluish black towards tip, bluish white at base; cere yellow; eyes brown; head, together with the back and sides of neck, dull blue-grey, each feather marked along the centre by a fine longitudinal black streak; interscapulars, back, shoulders, and scapulars, deep rufous, with irregular or somewhat triangular black spots; chin tawny; breast rufous, variegated with longitudinal black lines; belly rufous, with black spots; vent and thighs tawny, without variegations. Primary and secondary wing coverts black, with irregular tawny-white transverse bands; primary wing feathers black, the inner vanes nearly completely crossed by numerous white indentations; secondaries blackish, both vanes crossed by irregular rufous bands. Tail dark bluish grey, with seven or eight black bands, the last nearly an inch in width; on the three outermost feathers of each side the black only appears upon the inner vanes; all the feathers broadly tipt with white. Legs and toes yellow; claws black. Length of male twelve inches, of female fourteen inches.

Young.—Head and neck rufous tawny, with indistinct longitudinal black streaks; back and shoulders light rufous, with large irregular or triangular black spots; chin nearly white; throat light tawny rufous, with irregular streaks like those on the head; belly of the same ground colour as breast, and streaked or spotted before, behind like the vent and thighs, without variegations. Wing feathers all distinctly tipt with white. Tarsi, toes, and cere, dull yellow.

Falco rupicoloides, Smith. Head, neck, back, shoulders, and scapulars, pale tawny, clouded with pale rufous; the head and neck variegated with longitudinal black stripes; the back, shoulders, and scapulars, with broad brown transverse bars; rump brown with blue-white bars. Throat and under parts a pale fawn-colour, the breast and belly with a few brown stripes; flanks rayed with brown. Quill feathers brown, inner vanes banded with pale rufous. Tail brown, with about six bluish

white transverse bands, tips of the feathers pure white. Bill bluish black, base of lower mandible yellow; cere, tarsi, and toes, yellow; claws black; eyes sandy-grey. Length sixteen inches.

Inhabits South Africa.

Falco punctatus, Cuvier. Above deep rufous; head and neck variegated with longitudinal black stripes; back and shoulders with broad transverse black blotches: below white, breast with longitudinal brown blotches, belly and vent with roundish, brown-black, spots. Primary quill feathers black, inner vanes partially crossed by white or rufous bars; secondaries rufous, barred with black. Tail dark rufous with about six transverse black bands, the tips of feathers rufous white. Bill blackish blue, base of lower mandible yellow. Legs and toes greenish yellow. Length of male eleven inches, of female twelve inches.

Inhabits Isle of France and Madagascar.

Obs. In the specimens from Madagascar the black spots on the back are generally smaller, the under parts are principally rufous, and the tail blue-grey with black transverse bars.

Falco subbuteo, Lath. Head and upper part of neck dark blue-grey, rest of upper parts light blue-grey; the shafts of all the feathers black; over each eye a narrow rufous-white stripe, and below each, a black crescent, the one extremity extending under the eye, the other on a line with the base of lower mandible; sides of neck, throat, breast, and belly, tawny-white; the two last freely variegated with longitudinal black blotches; vent, under tail coverts, and thighs, rufous. Outer vanes of wing feathers hoary-blue, inner dull brown, crossed with white bars towards quills, all very finely margined and tipt with dull white. Tail slightly rounded, the two centre feathers blue-grey, the rest blue-grey banded on the inner vanes with pale rufous and tipt with tawny white. Bill bluish, base of lower mandible yellow; cere, legs, and toes, yellow; claws black. Length thirteen inches.

Inhabits South Africa and Europe.

Le Hobereau, Buff. Hobby Falcon, Lath. Falco Cuvierii, Smith, *South African Quarterly Journal, vol.* i. *p.* 392.

Falco Lythofalco, Lin. Upper parts of body and tail ashy-blue, the centres of feathers with a longitudinal brown stripe; five irregular black transverse bands formed by isolated spots upon the tail, the one towards the point very broad; tips of the feathers inclined to white. Throat white, rest of under parts yellow-rufous with longitudinal brown spots; bill blue; cere, space round eyes, and feet, yellow. Quill feathers rayed on inner vanes with white; sometimes a rufous or yellow rufous

collar towards lower part of neck above. Length of male eleven inches.

Young.—Upper parts dark brown, feathers bordered with rufous; tail blackish, with five narrow brown-red bands; the bands of primary quill feathers rufous white.

Inhabits Egypt, Porto Rico, and Europe.

Falco æsalon. Linn. Le Rochier, Buff. *Ois.*

Fam. STRIGIDÆ. *Vigors.*——Owls.

Bill straight at base, curved towards the point; cere membranous covered with stiff hair or setaceous feathers; sides of upper mandible a little dilated towards edges, the lower mandible shorter than the upper, truncated and notched at point; nostrils rounded, oblique, entirely open or covered by the setaceous feathers of the cere; tarsi mostly feathered, when not feathered, reticulated; the anterior toes nearly equal, the external versatile, moderately robust; claws strong and retractile. Tail generally moderate, even, rarely elongated and graduated.

Genus Surnia. *Dumeril.*

Head rounded without enlarged conch or egrets; tarsi and toes feathered to the claws; tail long, graduated.

Surnia choucou. Base of bill surrounded by fine feathers resembling hairs; upper part of head, back of neck, interscapulars, and wing coverts, reddish grey-brown; the latter variegated with white spots; wing feathers tipt with white. Tail composed of twelve feathers, the two centre ones grey-brown like the wings, the rest grey-brown, the outer vanes banded with pure white, the inner vanes pure white without bands. Throat and under parts pure white; the feathers of the legs very long; insides of shoulders white. Bill small, and like the claws black; eyes bright orange. Length eight inches and a half; figure slender. Wings when folded reach to the middle of the tail.

Inhabits South Africa,—towards the Knysna.

Strix choucou, Lath. Le Choucou, Le Vaill. *Ois. d'Afriq. pl.* 38.

Surnia nisuella. Plumage above brown, of different tints, passing insensibly from the deepest to the lightest shades, or even in some to white; throat with a sort of collaret or white blotch. Breast, and under parts of body, of the same colour as the back, but disposed in somewhat regular transverse bars, lightest towards the legs; the latter covered with fine silky grey-white feathers. Tail beneath banded brown-black and

reddish white, above the white is more pure and the brown lighter. Bill and claws brown black; eyes deep topaz yellow; wings when folded extend over two-thirds of the tail. Length about twelve inches.

Inhabits South Africa,—Great Namaqualand.

Strix nisuella, Lath. Le Chou-cou-hou, Le Vaill. *Afriq. pl.* 39.

Obs. In the figure given by Le Vaillant, the facial disc is margined by two rows of brown spots.

Genus Noctua. *Savigny.*

Head without egrets, ear opening oval, moderate. Facial disc little develloped, almost incomplete; toes feathered or covered with rigid hairs; tail short, equal.

Noctua hirsuta. Forehead and lores whitish with a few black hairs at the base of the beak; top of head and nape ashy brown; back wing coverts and quills an uniform brown; scapulars and inner secondaries spotted on inner webs with white; throat reddish; breast and belly whitish, varied with large reddish brown spots; tail feathers banded with four bars of brown and four of ash-colour, their tips white; toes marbled with red and brown, their edges with rough excrescences of a yellowish colour, and a regular series of strong bristles; bill black; the tail white.

Inhabits Madagascar, India, and Ceylon.

Strix hirsuta, Temm. *pl. col.* 289.

Noctua occipitalis. Forehead and upper part of head reddish, dotted with white; upper part of body brown and yellow, with white spots encircled with black; male with a whitish band on the occiput; female, a reddish one; on each side of this a band composed of a tuft of feathers spotted with black and white; all the lower parts of body dashed with clear red; quills regularly banded, alternately, brown and reddish. Tail feathers brown or yellow, with five white spots on both webs, those on the outer ones smallest; legs and toes covered with a very short down; beak yellowish, with some white hairs on its sides as well as near the eyes. Length seven inches.

Inhabits Africa.

Strix occipitalis, Temm. *pl. col.* 34.

Noctua Woodfordii, Smith. Above brown, freely sprinkled with somewhat triangular, clear white spots, and the back, scapulars, and shoulders, marked besides with narrow transverse, obscure white, or dull tawny zig-zag lines; the outer-

most scapulars principally white, forming an irregular oblique band of that colour on each side; shoulders also with some large white spots. Primary quill feathers dull brown, the outer vanes barred with white, the inner ones with tawny; secondaries light brown. Facial disc white sprinkled with brown, but immediately around the eye pure black; eyebrows white, feathers crossed by narrow black bars; guttural collar white, crossed with black lines; sides of neck and breast tawny brown marked with brown and white transverse bars; belly irregularly banded black and white, and more or less clouded with pale rufous; legs rufous white with waved transverse brown lines. Tail brown with narrow bands of tawny white, which are generally edged by a darker brown; tips of feathers dull white. Bill and eyes yellow, the feathers about base of bill setaceous, white towards bases, black toward extremities; toes above covered with setaceous feathers, on the sides bare, reticulated and yellow; claws a dark horn-colour. Length about twelve inches.

Inhabits South Africa,—*rare.*

Large-eyed Owl, Latham.? *History of Birds, vol.* i. *p.* 360

Noctua Capensis, Smith. The upper parts of the head, and the back and sides of the neck, brown, each feather towards tip crossed by a narrow white bar; interscapulars, back, rump and shoulders, black-brown, the feathers with two or more waved, narrow, rufous, transverse stripes, several of the outermost scapulars principally white, giving rise to a stripe of that colour on each side of the back; on shoulders also some large white blotches; edges of shoulders white. Quill feathers brown, crossed with narrow rufous or white bands. Throat brown mixed with white; breast brown, barred irregularly with white and tawny; belly pure white variegated with ferruginous brown blotches; thighs tawny, mottled with black-brown. Tail dark black-brown, crossed by twelve very narrow rufous bars, and tipt with rufous Bill greenish yellow; claws yellow at bases, blackish towards points. Length nine inches.

Inhabits South Africa,—*rare.*

Noctua perlata, Vieill. Upper parts of head and neck rufous-brown or simple brown, spotted freely with white; in front of interscapulars a more or less distinct light rufous collar; the rest of upper parts brown, sparingly spotted with white, each spot encircled by black-brown; several of the outermost scapulars half-white, forming a continuous line of that colour on each side of back; shoulders with a few white blotches intermingled with the white spots. Wings brown, imperfectly barred with white or pale rufous. Under parts either rufous variegated

with white, or an irregular mixture of brown rufous and white, the vent and under tail coverts, in some, nearly pure white. Tail dark brown, crossed by five or six rows of white spots, the last row at the tips of the feathers. Bill yellowish; claws a dark horn-colour. Length seven inches.

Inhabits Southern Africa and Senegal.

Le Perlèc Levaill, *pl.* 284. Strix perlatà, Vieillot.

Genus Scops. *Savigny.*

Head with lateral egrets; facial disc incomplete or indistinctly formed; tarsi feathered to the toes; tail short.

Scops Europeus. Above brown, finely variegated with white, grey-white, and tawny white bars or spots, and with black longitudinal stripes; sides of head from bill to egret white, the feathers crossed with delicate black lines; egrets brown, finely marked with black and white variegations; rostral feathers long and rigid, white towards bases, the points black; cervical collar brown-black and white, most distinct on sides of neck; outermost scapulars with large tawny-white spots. Wing feathers blackish brown, outer vanes barred with white, inner vanes towards margins marked with a series of rufous spots. Under parts grey-white clouded with tawny, variegated with fine black undulated bars and longitudinal black blotches and stripes. Tail tawny-white, finely and closely barred with brown or black, some of the bars of the latter colour being longer than others give the appearance of narrow irregular black bands; tips of feathers tawny. Legs pale tawny more or less pointed with brown. Eyes, toes and base of bill yellow; tip of bill and claws black. Length seven inches.

Inhabits South Africa, Senegal, and Europe.

Strix Scops, Linn. Le Scops or Petit-Duc, Buff. Scops-eared Owl, Lath. *Orn.*

Obs. Most Ornithologists regard the Owl above described as identical with the little-eared Owl of Europe, yet I am much disposed to consider it as distinct. Its colours are much darker and differently disposed, and in themselves, even different on the inner vanes of wing feathers: I am the more inclined to this opinion, as I have now before me a specimen from Senegal, which exactly corresponds with the European Scops. The colours of the South African bird being constantly different, it may perhaps be designated as the *Scops Capensis*, and that of Senegal as the *Scops Europeus.*

Genus Otus. *Cuvier.*

Ear opening very large, extending from the bill to nearly the top of the head, with a membraneous operculum in front; head with egrets erectile at the pleasure of the bird; bill long, compressed, and curved from the base; tarsi feathered to the toes.

Otus ascalaphus. Egrets or horns rudimentary and slender; setaceous feathers of the cheeks directed upwards and very short above the eyes, and assist in giving a flattened appearance to the forehead and top of the head; beak black; body, wings, and tail, whitish red varied with different shades; the whole body spotted and striped with brown-black, the spots lanceolate on the head and nape, confluent on the ears; the quills and tail feathers with broad bands and narrow zigzag brown stripes; breast dashed with the same; the rest of the under part with fine transverse stripes. Under surface of tail white, with five or six narrow dusky transverse bands; throat and middle of breast white; tarsi long, and as well as the toes covered with whitish feathers. Length about eighteen inches.

Inhabits Egypt.

Strix Ascalaphus, Savig. *Egypt.* Temm. *pl. col.* 57.

Otus leucotis. Egrets placed above the eyes, long and pointed, which, with the feathers of the head and nape, are dull white varied with reddish zigzag lines, and a longitudinal black stripe in the direction of the shafts, the tip of each feather is black; face and cheeks white with a rufous tinge under the eyes and a broad black band behind, extending to the egrets; edges of wings and large coverts white, upper and under parts of body light rufous, variegated with black and vermiculated with brown; quills and tail feathers ashy, delicately marked with brownish zigzag lines and broad transverse stripes; vent white, with brown stripes. Bill a whitish horn-colour, and nearly covered by pure white bristles. Length six inches.

Inhabits Senegal.

Strix leucotis, Temm. *pl. col.* 16.

Otus maculosus. Above brown or black-brown; the upper parts of head, neck, and interscapulars, irregularly spotted with white or tawny-white; the back, scapulars, and shoulders, mottled with white or tawny-white undulated bars or blotches. Face grey, the feathers crossed by black bars; egrets brown, spotted with white; chin white; cervical collar dark brown, mottled with white in front of neck; in front of breast a large white crescent. Breast and flanks white, barred with brown and blotched with black; belly and legs tawny or pure white, more regularly barred with narrow brown lines. Tail slightly rounded, two centre feathers brown with four or five irregular tawny-white bars; lateral feathers brown with the transverse tawny bars more distinct. Eyes fine yellow; bill and claws black. Length eighteen inches.

Inhabits South Africa,—common.

Strix maculosus, Vieill. *Gal. pl.* 23. Strix Africanus, Tem. *pl.* 56.

Otus Capensis, Smith. Above brown, finely freckled or marked with pale tawny, undulating lines and the shoulders variegated with some large tawny blotches; face tawny-white, mixed with black near the eyes; egrets small, brown variegated with tawny; cervical collar dark brown, spotted with fulvous in front of neck. Anterior part of breast nearly an uniform brown, rest of breast and belly finely mottled brown and white, the colours principally disposed in zig-zag transverse lines and bars, and in some specimens the shafts are deep brown; vent and tail coverts tawny-white. Primary wing feathers pale fulvous, irregularly barred with brown, and the points entirely brown; secondaries brown with partial fulvous bands, the tips tawny white, more or less mottled with brown. Tail slightly rounded, the two centre feathers brown, with four tawny bars, the distal one broken and indistinct, the outer feathers tawny white with three brown bars, the extremities of all the feathers nearly pure white. Legs tawny white; bill and claws black. Length fourteen inches.

Inhabits South Africa,—in marshy situations.

Marsh Owl *of the Cape Colonists.*

Otus Madagascariensis, Smith. Above blackish brown, each feather with a tawny blotch on each vane, producing a mottled appearance; scapulars blotched, banded or undulated with tawny. Wing feathers dull brown, with tawny bars, many of them brownish towards their centres. Egrets black-brown, some of the feathers blotched on both vanes with tawny, others only on outer vanes; cheeks tawny-brown; shafts and points of feathers black; rostral feathers black and white. Throat crossed by an obscure white crescent, and below that an indistinct collaret which extends on each side of the neck nearly to the egrets, and is mottled black-brown and tawny-white. Under parts tawny with longitudinal brown blotches, largest on the breast. Legs tawny rufous with a few brown variegations. Tail dark brown, with four or five light brown bands margined with tawny. Bill bluish black; claws black. Length fifteen inches.

Inhabits Madagascar.

Obs. This species stands close to *Otus brachyotos*, but differs from it particularly in the want of white spots on the upper parts, and in the distribution of the colours of the collaret and hinder parts of the belly.

Genus Strix. *Savigny.*

Bill straight at base, curved towards tip; ear opening ample with a large operculum; the circle of setaceous feathers of face much developed; no egrets; tarsi feathered; toes covered with hairs.

Strix Capensis, Smith. Upper parts brown, clouded with black-brown, and thinly spotted with white dots; under parts yellowish white freely mottled with small brown spots. Facial disc clear white with a large black blotch at the inner angle of each eye; cervical collar dull white, the feathers tipt with tawny-brown, and streaked along their centres with dark brown. Wings about two inches longer than the tail; primary wing feathers brown, irregularly mottled with fulvous towards quills; secondaries tawny without, white within, and imperfectly barred with brown, the tips chiefly brown, edges of shoulders tawny-white, insides white, mottled with black spots. Tail short, two centre feathers brown with some white spots at tips, outermost feathers white imperfectly banded with brown, intermediate ones tawny-brown on outer vanes, white on inner, and both partially barred with brown. Tarsi an uniform yellowish white; bill yellowish white; eyes brown-black; toes yellow with a thin sprinkling of rigid yellowish hairs; claws horn-yellow. Length seventeen inches.

Inhabits South Africa.

Genus Bubo. *Cuvier.*

Ear opening small; facial disc indistinct; head with two egrets; tarsi feathered to the toes.

Bubo lactea. Bill large, blackish blue towards tarsi, yellowish towards point, and furnished on each side with long, narrow, bristly, black feathers; cheeks white, broadly margined behind with deep black; egrets black towards points, waved black and white towards bases; crown waved black and white; rest of upper parts dull brown, finely and irregularly waved with dull white lines; chin white, undulated with brown; throat pure white; breast and belly dull white, waved with delicate irregularly disposed zigzag lines. Primary wing feathers white towards quills, brown towards tips, and banded with blackish transverse bands; secondaries banded alternately brown and dull white, the latter with fine brown undulations. Tail rounded, banded alternately brown and white, the white bands about four in number, are mottled with brown; on the outer vanes of all the feathers; legs dull white with waved transverse brown lines; claws black. Length of male about twenty inches, of female about two feet.

Inhabits South Africa and Senegal.

Strix lactea Temm. *pl col.* 4.

Bubo Capensis, Smith. *Young.*—Upper parts of head blackish brown, the feathers blotched and tipt with tawny; egret blackish, variegated on inner edges with clear tawny; back and

sides of neck dark brown, mottled with fulvous, the latter in large spots upon both vanes; back and shoulders blackish brown dashed with fulvous or tawny-white. Wing feathers black-brown with tawny bands, the latter often brown in the middle, particularly on the secondaries. Facial disc principally pale tawny-brown, at inner angles of eyes white; the rostral feathers tipt with black; cervical collar blackish, mottled with white at the throat, towards extremities brown; chin, and a large crescent in front of breast, white; breast and belly blackish brown, variegated freely with large transverse tawny blotches, which, towards the thighs, exhibit a whitish tint; legs rufous-white with small brown blotches; toes rufous-white, without variegations. Tail slightly rounded, the outermost feathers of each side banded black-brown and tawny-white, the bands of the latter colour brown in the middle, the centre feathers blackish brown with tawny bands, dusky in the middle; tips of all the feathers tawny-white, finely mottled with brown. Bill black; eyes yellow; claws light horn-coloured, darkest towards points. Length twenty-two inches.

Inhabits South Africa.

Obc. This bird I am convinced is distinct from the Bubo Europeus. Adult specimens are said to be marked nearly as the young ones.

Order INSESSORES. *Vigors.*

Bill various; legs short or moderate; tarsi usually clothed with feathers; toes flat beneath; claws slender, moveable, somewhat retractile, curved and acute.

Tribe FISSIROSTRES.

Bill broad at the base, gape very wide; legs short.

Fam. MEROPIDÆ.

Genus Merops.

Bill longer than the head, curved, rounded, slightly compressed on the sides, and pointed; nostrils lateral, rounded or in the form of a longitudinal fissure. Wings long and pointed, first or third quill the longest. Tail long, even, graduated or forked, often the two middle feathers longer than the others and terminating in narrow points. Tarsi short, slender, and scutellated.

• *With the middle tail feathers elongated.*

Merops Apiaster, Lin. Throat yellow, margined behind with black; front greenish white; occiput, back of neck, and interscapulars, maronne; back, rufous-yellow; middle of wings dark rufous; quill feathers and tail, olive-green; ocular band black; breast and belly, bluish green. Bill black; eyes red; feet brown. The two middle tail feathers an inch longer than the others. Length from bill to point of tail eleven inches.

Young.—Above brown-green; eyebrows rufous; no black collar; tail feathers all of equal length.

Inhabits Africa and Europe,—during the summer in South Africa.

Merops Malimbicus, Shaw. Head and neck slate-grey; chin white, passing in the form of a streak on each side of the throat; upper parts of body, wings, and tail, vinaceous ash-colour; quill feathers blackish brown; eye band blackish brown. Lower part of throat, breast, belly, and thighs, a fine deep or sanguine rose-colour, palest towards the vent. The two middle tail feathers about an inch and a half longer than the others, and terminate in narrow points. Bill and legs black; eyes red. Length about ten inches.

Inhabits Malimba.

Merops bicolor, Daud.

Merops Nubicus, Lin. Head and throat sea-green, the latter margined below with black; eye band black; neck, back, breast, and belly, bright red; wings and tail a dull red; quill feathers black at the tips, clouded with green; scapulars green-brown; tail feathers pointed with obscure green, the two centre ones much longer than the others, narrow towards the points, and of a blue-black colour; rump, vent, and under tail coverts, light blue. Bill black. Length from bill to point of middle tail feathers eleven inches and a half.

Inhabits Africa,—rare in South Africa.

Merops cæruleocephalus, Shaw.

Merops Ægyptius, Savig. Front yellowish white; forehead and eyebrows light green; top of head, neck, back, shoulders, breast, belly, and vent, dark green; eye band black, edged below by light green; anterior part of throat yellow, hinder part maronne; outer vanes of wing feathers olive-green, inner vanes dark dusky green, all tipt with black; tail feathers olive-green, the two centre ones about two inches longer than the others, narrow towards points, and green-black. Bill black; legs and toes brown. Length ten inches and a half.

Inhabits South Africa.

Var. Front, eyebrows, and line from base of lower mandible, white or green-white; upper parts, particularly head and neck, dull brown-green; breast light olive-green; belly light green, palest towards vent.

Inhabits Madagascar.

Merops Savignii, Le Vaill. *pl.* 6. Merops superciliosus, Lin.?

Obs. A variety of this species occurs in India and Java, with the rump, vent, tail, eyebrows, and stripe under eyeband, light blue, the upper parts olive-green; the belly light green.

Merops Cuvierii, Le Vaill. Front, eyebrows, and throat, white; top of head, eye-band, and middle of throat, black; neck, above rufous-green; interscapulars and shoulders green; scapulars blue-green; outer vanes of quill feathers olive-brown, inner vanes rufous green, all tipt with black. Back, rump, tail, and a transverse bar below, black; of throat, blue-green; breast and belly greenish white; vent light blue; two centre tail feathers longest, and narrow towards points, where they are of a black colour. Bill black. Length to tip of tail eleven inches.

Inhabits Senegal.

Merops Savignii, Swain. *Zool. Ill. pl.* 76. Le Vaill. *pl.* 9.

** *With the tail even.*

Merops Bullockii. The upper parts of the head, back, shoulders, rump, and tail coverts, green; back and sides of neck rufous-green; wing feathers green; the primaries faintly and the secondaries distinctly tipt with black. Eye-band black; throat red; breast and belly rufous-green; vent and under tail coverts dark blue. Tail even, two centre feathers green. Bill and legs black. Length seven inches.

Inhabits Senegal.

Merops Bullockoides, Smith. Front greenish white; eyebrows green; top of head and back of neck, pale chesnut, clouded with green; back, shoulders, wings, and tail, dark green; the secondary quill feathers broadly tipt with black; eye band black, edged below with white; throat red; breast and belly rusty olive-green; rump, vent, and under tail coverts, deep blue. Bill and legs black; tail even. Length eight inches.

Inhabits South Africa.

Obs. This may be only a variety of the former, or the opposite sex.

(*To be continued.*)

SOUTH AFRICAN
QUARTERLY JOURNAL.
SECOND SERIES.

No. 4. JULY—SEPTEMBER, 1834. Part 2.

Instructions for Making and Registering Meteorological Observations at various Stations in Southern Africa, and other Countries in the South Seas, as also at Sea.

Drawn up for Circulation by the METEOROLOGICAL COMMITTEE of the SOUTH AFRICAN LITERARY AND PHILOSOPHICAL INSTITUTION, (and forming part of their first Report to the Institution.)

THE great importance of possessing an exact and carefully registered account of the variations of the Barometer, Thermometer, and other Meteorological Instruments, and of the Winds and Weather, throughout that extensive region of the Southern Hemisphere, which is either included within the boundaries of this Colony, or readily accessible from it, has determined the South African Literary and Philosophical Institution to request the assistance of its Correspondents and of all who may have leisure and inclination for observations of the kind, towards the gradual accumulation of a continued and extensive series of Meteorological Journals, and towards carrying into effect a concerted plan of contemporaneous observations, on stated days, from which it is conceived that much advantage will be derived. The Institution therefore solicits the attention of its Correspondents, and of the lovers of knowledge generally, to this object—and earnestly requests their co-operation in making, arranging, and forwarding to its Secretary, resident in Cape Town, observations of the nature, and, so far as practicable, according to the plan of those hereafter detailed. Such observations alone can furnish the materials necessary for an accurate and scientific inquiry into the laws of *climate* regarded as an object of local interest, and are the only data through which (taken in conjunction with the known laws of physics) the more general relations of Meteorology can be successfully investigated.

It can scarcely be necessary to insist on the practical importance of this Science to the Agriculturist, to the Navigator, and indeed in every branch of human affairs, or

to dilate on the benefits which must accrue to mankind in general, from any successful attempts to subject to reasonable and well-grounded prediction the irregular and seemingly capricious course of the Seasons and the Winds; or on the advantages, purely scientific, which must arise from a systematic developement of laws, exemplified on the great scale in the periodical changes of the atmosphere, depending, as they do, on the agency of all the most influential elements, and embracing in their scope every branch of physical science. It is more to the present purpose to observe that, from what has already been done in this department of human knowledge, there is every reason to hope that no very distant period may put us in possession of the key to many of the most intricate Meteorological Phænomena, and enable us, though not to predict with certainty the state of the weather at any given time and place, yet at least to form something like a probable conjecture as to what will be the general course of the next ensuing season—perhaps to prepare us beforehand for violent and long-continued gales of wind—great droughts—or extraordinarily wet seasons, &c. in the same manner that our knowledge of the nature and laws of the tides, although confessedly imperfect, and in great measure empirical, yet enables us to announce beforehand, unusually high or low tides. No doubt such predictions of the weather, although only of a probable nature, would be highly valuable and useful, and would materially influence the practice of men in all operations thereon depending. In illustration of this, we need only refer to the value set by many Farmers and others on Weather-tables founded on no sound principles, and ratified, at best, if at all, only by a very partial and limited experience—or, to choose a better instance, we may cite the importance which is now attached by every seaman to the indications of the Barometer, and the numerous cases with which nautical records abound, of great mischief, or even shipwreck, avoided by timely attention to its warnings.

Meteorology, however, is one of the most complicated of all the physical sciences, and that in which it is necessary to spread our observations over the greatest extent of territory, and the greatest variety of local and geographical position. It is only by accumulating data from the most distant quarters, and by comparing the affections of the atmosphere at the same instant at different points, and at the same point at different moments, that it is possible to arrive at distinct and useful conclusions. Hence arises the necessity of procuring regular series of observations made on a uniform system, and comparable with themselves and with each other, by observers at different stations, and of multiplying the points of observation as much

as possible over the interior surface of continents—along sea coasts—in islands—and in the open ocean.

The geographical position of this colony renders it perhaps the most interesting and important situation on the surface of the globe, for observations of this nature; first, whether we regard it either as an advantageous station for observing the commencing action of the great counter-current of the trade winds, where it first strikes the earth's surface, and, combined with the action of the heated surface of the African Promontory, gives rise to that remarkable alternation of South-east and North-west winds, which forms so distinguishing a feature of our climate—or consider it, secondly, as the farthest extremity of one of the two great *loles* of land which form the terrestrial part of our globe, and as such, constituting at once a barrier to the currents and tides of two great oceans, and a limit to their climates—or, lastly, as a great nautical station, and one not devoid of difficulty and danger, in which every consideration of practical interest combines to stimulate the curiosity of the theorist, and give importance to the results of his inquiries.

As these pages may fall into the hands of many who have been little in the habit of observing systematically, or who may not be in possession of instruments of the nicest construction, attention to the following instructions is recommended as the means of rendering their observations most available for useful purposes, and comparable with each other, and with those intended to be refered to as standards.

I. *General Recommendations and Precautions.*

1. The continuity of observations ought to be interrupted as little as possible by changes in the adjustments of instruments—in their places—exposure—mode of fixing—or of reading off and registering them. Whenever any alteration in these or any other particulars takes place, especially such as are likely to affect the zero points, or otherwise to influence the mean results, it should be noticed in the register.

2. So far as possible, registers should be complete—but if by unavoidable circumstances of absence, or from other causes, blanks occur, no attempt to fill them up by general recollection, or by the apparent course of the numbers before and after, should ever be made.

3. The observations should, if possible, all be made by one person—but as this may often be impracticable, the principal observer should take care to instruct one or more of his family how to do it, and should satisfy himself by many trials that they observe alike.

4. The entries in the register should be made at the time of observation, and the numbers entered should be those actually

read off on the respective scales of each instrument, on no account applying to them previous to entry any sort of correction, as for instance for zero, for temperature, capiliarity, &c. All these and the like corrections, being matter of calculation and reasoning from other observations, are to be reserved till the final discussion of the series, and for separate determination and statement.

5. If copies be taken of the registers, they should be carefully compared with the originals by two persons, one reading aloud from the original and the other attending to the copy, and then exchanging parts, a process always advisable wherever great masses of figures are required to be correctly copied.

6. A copy so verified, or the original, (the latter being preferred) should be transmitted regularly (if possible *monthly* from places within the limits of the colony) to the Secretary of the South African Literary and Philosophical Society, at Cape Town, which institution on its part will take care that such documents shall not merely be treasured as a dead letter in its archives, but shall be rendered available towards the improvement of Meteorological knowledge, to the full extent of their actual scientific value.

7. The register of every instrument should be kept in parts of its own scale, as read off, no reduction of Foreign measures or degrees to British being made—but it should of course be stated *what* scale is used in each instrument.

II. *Of the Times of Observation and Registry.*

Meteorological observations should be made and registered daily, at stated and regular hours. In fixing on these, some sacrifice of system must of necessity be made to the convenience and habits of the observer. The best hours in a scientific point of view would be those of Sun-rise, Noon, Sun-set, and Midnight, and these are the hours for which the registers are kept at the Royal Observatory. But these are not the hours adapted to general habits, and since the midnight observation is likely to be pretty generally neglected elsewhere than in an Astronomical Observatory, the following hours, for a division of the day into three parts, are proposed for what may be deemed the Morning, Afternoon, and Evening observations, viz.

Morning,	-	8 A. M.
Afternoon,	-	2 P. M.
Evening,	-	8 P. M.

If however the habits or engagements of any one should not allow him to conform to these hours, rather than not observe he may select his own, specifying only what they are at the head of every page of his register, and adhering steadily to

them in practice, only observing to make the extreme observations of each day equidistant from the middle one.

At the same time it will be borne in mind, that in what concerns the great Meteorological questions on which the most interesting features of the subject depend, the night is quite as important as the day, and has hitherto been far too much neglected. To any one therefore who may feel disposed to enter more zealously into the subject, and will not consider some personal inconvenience ill undergone for the sake of affording data of a peculiarly valuable description, this Committee would most earnestly recommend the adoption, in preference to all others, of the quaternary division of the 24 hours as followed at the Royal Observatory above alluded to. And they leave it to the consideration of the Council, whether the keeping and transmission of registers on this principle might not advantageously be distinguished by some honorary reward, as that of a Medal for instance, should the funds of the Institution admit of it.

With a view, however, to the better determining the laws of the diurnal changes taking place in the atmosphere, and to the obtaining a knowledge of the correspondence of its movements and affections over great regions of the earth's surface, or even over the whole globe, the Committee have resolved to recommend, that four days in each year should henceforward be especially set apart by Meteorologists in every part of the world, and devoted to a most scrupulous and accurate registry of the state of the Barometer and Thermometer; the direction and force of the Wind; the quantity, character, and distribution of Clouds; and every other particular of weather, throughout the whole twenty-four hours of those days, and the adjoining six hours of the days preceding and following.* The days they have been induced to fix on and recommend for these observations are, the 21st of March, the 21st June, the 21st September, and the 21st December, being those, or immediately adjoining to those of the Equinoxes and Solstices, in which the Solar influence is either stationary or in a state of most rapid variation. *But should any one of those 21st days fall on Sunday, then it will be understood that the observations are to be deferred till the next day, the 22d.* The obser-

* This is necessary by reason of the want of coincidence of *the day* in different parts of the globe, arising from difference of longitude. In order to obtain a complete correspondence of observation for 24 successive hours over the whole globe, it must be taken into account that opposite longitudes differ 12 hours in their reckoning of time. By the arrangement in the text the whole of the *astronomical day* (from noon to noon) is embraced in each series, and no observer is required to watch two nights in succession.

vation at each station should commence at 6 o'clock A.M. of the appointed days, and terminate at 6 o'clock P.M. of the days following, according to the usual reckoning of time at the place. During this interval, the Barometer and Thermometer should be read off and registered hourly, or at all events, at intervals not more than two hours asunder, and the precise hour *and minute* of each reading should be especially noted.

For obvious reasons however, the commencement of every hour should, if practicable, be chosen, and every such series of observations should be accompanied by a notice of the means used to obtain the time, and when practicable, by some observation of an astronomical nature, by which the time can be independently ascertained within a minute or two.* As there is scarcely any class of observations by which meteorology can be more extensively and essentially promoted, it is hoped that not only at every station of importance in this colony but over the whole world, and on board ships in every part of the ocean, individuals will be found to co-operate in this inquiry. Every communication of such observations addressed by channels as secure and as little expensive as possible to the Secretary of this Institution, will be considered as highly valuable.

III. *Of Meteorological Instruments, and first of the Barometer and its attached Thermometer.*

The Barometer is the most important of all Meteorological instruments. Its office is to measure the actual pressure of the atmosphere on a given horizontal surface at the time and place of observation. Its fluctuations are observed to have considerable relation to changes in the weather, and especially of the wind. Hence its use as a weather glass.

A Barometer should be examined, before setting it up, for air-bubbles in the tube, and for the existence of air above the mercury in the upper part of the tube. This is done by gently inclining the instrument either way from the horizontal position a little up and down; when air-bubbles, if large, will be seen to run to and fro, and must be evacuated by inverting the instrument and by gentle blows on it with the hand, driving them up into the cistern. If this cannot be done, the instrument is useless. If air exists to an objectionable amount *above* the quicksilver, it will not tap *sharp* against the upper end of the tube when the barometer is quickly inclined from a vertical

* For example, the first appearances and last disappearances of the Sun's upper and lower border, above and below the sea horison, if at sea or on the coast,—or, on land the exact length of the shadow of a vertical object of determinate length on an horizontal level, at a precise moment of time (not too near noon), &c.

position so as to make the mercury rise above its level, nearly to the top, and then gently *jerked* lengthways and backwards. If the blow is puffy and dead, or is not heard at all, the amount of air must be considerable, and may be expelled by inversion.

In fixing the barometer, choose a good light near a window, but not exposed to sunshine, in a retired apartment, little liable to sudden changes of temperature or to drafts of wind. Adjust the tube to a vertical position by a plumb-line, and fix it so as never to shift from that position. Before reading off, give a few taps on the instrument, enough to make the upper end of the column of quicksilver *shake* visibly, as the mercury is apt to adhere to the glass and give erroneous readings. In reading, bring the index always opposite to one part. The correct part to choose is the summit of the convexity of the mercury, to which the index should be made a tangent, but if this be difficult to hit, either from the construction of the index or the want of a proper fall of light, the line of junction of the mercury and glass may be taken. In that case the tapping should never be omitted. Whichever mode of reading is once adopted should be stated, and always adhered to. A piece of white paper placed behind the upper part of the tube will generally enable any one to read off by the convexity of the quicksilver. In placing the index notice whether it appears to shift a little up and down as the eye is raised or depressed. This is called Parallax, and is a source of uncertainty to be avoided by placing the eye in reading always on the *exact level* of the top of the mercurial column.

Barometric observations require corrections of three kinds, and to render them available and comparable with others, it is necessary that their amount should be ascertained and distinctly stated. The first is called the Zero Correction. It includes several subordinate corrections arising from different sources, such as that originating in a faulty placing of the scale of inches, that due to the capillary depression of the Mercury in the glass tube, and the constant part (which at a fixed station is nearly the whole) of the depression arising from the presence of air or vapour in the upper part of the tube.

To determine the zero correction, the Barometer must be compared with a standard instrument, such as that at the Royal Observatory for instance, or some other which has been compared with it, or with some standard of equal authority. Such comparison ought never to be omitted before forwarding the Barometer to its place of destination, nor should any opportunity be neglected of comparing it, when fixed in its place, with a good portable Barometer. In making such comparisons, all that is necessary is to record the readings of both the

instruments, after at least an hour's quiet exposure, side by side, that they may have the same temperature. If compared by two observers, each should read off his own Barometer in his usual manner, and each should take a mean of several readings, then each should verify the other's result. By this means the zero of one standard may be transported over all the world, and that of all others compared with it ascertained.

The amount of the zero correction is often very large, as two or three-tenths of an inch, but its influence on the mean results of recorded observations, falls wholly on the determination of the heights of the station of observation above the mean level of the sea, and affects little, if at all, any conclusions of a meteorological nature which may be deduced from them. Hence, if proper care be taken to preserve a Barometer, once set up, immoveable, a long and regular series of observations with it has a value independent of any knowledge of this element, and it is fortunate that this is the case, as the zero correction is one extremely difficult to determine exactly *a priori*.

In transporting a *compared* Barometer to its place of destination, great care is necessary. It should always be carried *upright*, or considerably inclined, and *inverted*, and over all rough roads should be carried in the hand, to break the shocks to which it would otherwise be exposed. If strapped horizontally under the roof of a colonial wagon, or tied upright against the wood-work, with its head resting on the floor, there is not a chance of its escaping destruction. Strapped obliquely across the shoulder of a horseman however, it travels securely and well, and with common care in this mode of transport, its zero runs no risk of change.

The next correction, and the most important of all, is that due to the temperature of the Mercury in the Barometer tube at the time of observation. To obtain this, every Barometer requires to have attached to, or fixed very near it, a Thermometer, called the attached Thermometer, which must be read and registered at each observation of the Barometer. It is preferable in practice to read off this Thermometer *first*, to avoid the error arising from breathing on, or standing long near it, while reading the Barometer itself. The zero of this Thermometer should be ascertained by comparison with a standard at the temperature of about 60° Fahr.

The third correction applicable to barometric observations arises from change of level of the mercurial surface in the cistern, owing to the transfer of a portion of its contents to or from the tube. In Barometers with small cisterns, and where the lower level cannot be adjusted at each observation, its amount may be large, and its effect being always to make the

apparent fluctuation less than the real, *in a fixed proportion*, it ought, if possible, to be ascertained. The data necessary to be known are—first, the internal and external diameters of the tube—secondly, that of the cistern containing the mercury, at the surface, where the tube plunges into it. These particulars, as they must be known to the maker, ought to be inquired of him, and indeed ought to be engraved conspicuously on some part of the instrument.

Although all these corrections are necessary for the strict *reduction* of registered observations, they ought not to be applied to individual observations previous to registry. It is sufficient to know them. Their effect is in most cases easily and safely applicable to mean results, and to the conclusions therefrom deduced, and a world of troublesome and often mistaken calculations may be saved by so applying them.

Of the External Thermometer.

The External Thermometer should have a scale on which whole degrees are read off, and divisions large enough to admit of estimating tenths, or at least quarters of degrees, by the eye. It should be compared with a standard, and the difference stated, at one or more temperatures (the wider asunder the better) within the range of the climate in which it is to be used. In fixing it, choose a perfectly shaded but otherwise free exposure, and one where no *reflected* sunbeams from water, buildings, rocks, or dry soil, can reach it: and easily accessible for reading. There fix it firmly and upright. In reading it, avoid touching, breathing on, or in any way warming it, by near approach of the person. The quicker the reading is done the better.

Although read off at stated times, notice should be taken of all sudden and remarkable changes of temperature, as indicated by the external thermometer, whenever they occur. In the neighbourhood of the Cape, and in many other parts of the continent, hot winds frequently set in with great suddenness, often in the night, and singular alternations of hot and cold temperature occur, disturbing the regular laws of the diurnal fluctuation, and connected, doubtless, with many interesting meteorological phænomena peculiar to the climate of South Africa.

Of the Maximum and Minimum, or Self-registering Thermometer.

This should be placed horizontally in some place out of doors, shaded from direct radiation and rain, and otherwise freely exposed to air, and so fastened as to allow of one end being

detached from the fastening and lifted up, so as to let the indexes within the boxes slide down to the ends of the fluid columns, a more convenient mode, when the steel index is free enough to allow it, than the use of a magnet.

Both the thermometers should be read off as early as possible every morning, and the indexes re-adjusted. But as double maxima frequently, and occasionally double minima occur, in consequence of sudden changes of temperature, it is recommended occasionally to inspect both of them, with a view to ascertain whether the motion of either the mercury or spirit has been reversed in an unusual manner, and such double maxima or minima, when remarkable, should be recorded as "supernumerary," with their dates and leading features.

The Self-registering Thermometer is extremely apt to get out of order, by the indexes becoming entangled in the column of fluid. In travelling they should not for a moment be carried with the mercury bulb downwards—if this should happen, they are *sure* to arrive in a state unfit for use. To correct them is tedious, and always hazards fracture. With great care however it may be done, as follows:—

1st. The Spirit Thermometer. By many jerks force the index down to the junction of the bulb and tube; then by cautiously heating and cooling alternately the bulb, the tube, or the air vessel at the top, as the case may require, the disunited parts of the spirit may be *distilled* from place to place, till the whole is collected in one column in union with the spirit in the bulb.

2d. The Mercurial Thermometer. When the steel index gets immersed in the mercury it cannot be moved by a magnet, and lets the mercury pass by its side. First cool the bulb (by evaporation of ether, if necessary) till the mercury is either fairly drawn down below the index, or a separation takes place in the column, leaving the index with mercury above it. Endeavour then by tapping, warming the tube, or by the magnet, to loosen the index ever so little, then apply heat to the bulb and drive up the index with its superabundant mercury quite into the air vessel. This requires many trials and much patience. When there, hold the instrument bulb downwards, and suspend the index by a magnet at the top, allowing any globule of mercury to drop into the origin of the tube below, then heat the bulb cautiously over a very small clear flame of an oil lamp till the mercury rises to the very top of the tube and fairly unites with the globule there awaiting it. Let the bulb cool and the mercury will sink in one united column; if not, heat it again. When this is accomplished, the index may be set loose, by withdrawing the magnet, and restored to its proper position in the tube.

A Self-registering Thermometer may be advantageously left

(properly secured) for a whole year, or parts of a year, on elevated summits or other remarkable points, to ascertain their maxima and minima of temperature during absence. In such cases, take care to defend them from discovery, or accident from wild animals, birds, snakes, &c. In taking it up for reading off, observe not to derange the indexes, and do not leave it without seeing that the indexes are in contact, and the temperature that of the air at the moment.

Of Thermometers buried in the Earth.

Thermometers buried at different depths, for the purpose of examining the monthly changes of temperature of the soil, should have their balls and lower part of the scale well wrapped up in woollen cloth or pounded charcoal, and should be placed in strong earthen vessels, which may be entirely withdrawn from the ground so as to allow of inspecting and reading off the scale, without exposing the balls to any possibility of changing their temperatures while under examination. The vessels should be fitted with covers, to defend the scale from injuring in burying and digging up.

A pipe of earthenware, (composed of separate pieces) or one of wood, may be sunk 10 or 15 feet below the surface, into dry earth, and a thermometer defended as above, lowered *by a chain*. The pipe being then obstructed at every two feet, by some stuffing readily hooked up, the thermometer may be easily examined, and a register of its indications kept with very little trouble. In like manner the temperature of wells may be registered.

Of the Temperature of the Sea.

The surface temperature of the water at Sea should be registered as a matter of course, with the same regularity and at the same hours as the barometer and thermometer. It is more conveniently (and with quite accuracy enough for the purpose) obtained by taking up a bucket full of the water and stirring round the thermometer in it. Whenever a change to the extent of 2° Fahr. appears to have taken place since the last observation, a fresh bucket full should be taken up and the observation repeated It should also be noticed whether rain has fallen since the last observation. A sudden depression of 3 or 4° indicates the near approach of land. In a voyage from England, lately made by a Member of this Committee, the temperature of the surface water fell at once 9° Fahr. on approaching within a few miles of the entrance of Table Bay.

The temperature of the sea at considerable depths, can hardly be regarded as a subject of ordinary meteorological inquiry and regular registry, though undoubtedly one of much

physical interest, for which reason it is not considered necessary to dwell further on it.

Of the Hygrometer, &c.

In the absence of Daniells' Hygrometer, or of ether to cool it, the degree of dryness of the air may be ascertained by observing the temperatures marked by two thermometers, suspended freely side by side (but not in contact) in the shade, and completely defended from all radiation *to* or *from* the *sky*, the one having its bulb and stem naked, the other with the bulb and lower part of the stem wrapped in linen or cotton, and thoroughly wetted with pure spring or rain water. The temperatures indicated by both, should be noted when the wetted thermometer refuses to sink lower, and the conclusions left for subsequent calculations. The naked thermometer may be the "External Thermometer" itself, in which case a coated thermometer may be kept always suspended near it, completely screened as above mentioned, and wetted some minutes previous to the regular daily readings.

If a hair Hygrometer be used, its points of absolute moisture and dryness should be frequently ascertained, as they are apt to change The former may be found by keeping it some time in a close covered jar lined with wet blotting paper, and having water in it, and noting the point of moisture beyond which it refuses to go. The latter, by keeping it in the same manner in a jar perfectly air-tight, over fresh burnt quick-lime, till it refuses to indicate a higher degree of dryness.

The best measure of the *momentary evaporating power* of the air, seems to be the depression of the wetted thermometer below the dry one. But the *actual evaporation* from a given surface, is quite another thing, and a question may very reasonably be raised, how far any useful approximation to a knowledge of the total evaporation from an extensive and diversified surface, unequally moistened, and variously exposed to the sun, defended by clouds, or refreshed by dews, *can* be obtained by any small or local experiments.

The Rain Guage is an instrument of such extremely easy construction, that any person who lives near a tin-man can procure one. In a climate so arid as that of Africa, however, it must be remembered that it will often need examination and cleansing, owing to long intervals of disuse in which insects and dust may lodge. It will often happen, too, that the slight rain of one day, if left unregistered, will be entirely lost by evaporation in the next--nay, that slight and transient showers may never enter it, being evaporated from it as they fall. The effect of copious dew, too, must be separated from that of rain, so that the mere registry of the contents of the guage is not of

itself a sufficient indication whether rain has fallen in the night or no. However, there are usually good reasons for decision on this point from other indications. Attention to the amount of dew is very necessary, not only because the meteorological questions involved are of a high degree of interest generally, but because in arid climates the dews are of almost as much importance to the maintenance of vegetation as the rain.

In stating the quantity of rain daily received in the guage, the height of the receiver above the soil should be mentioned, experience having shown that the quantities of rain which actually fall on a given area on the ground, and at a very moderate height above it, often differ materially. In some localities and circumstances, the rain-drops receive accession from the air as they descend, in others they undergo partial evaporation. The former is generally the case in cool moist climates—the latter may be expected in this country.

Of the Wind.

The points most important to remark respecting the wind, are,

1st. Its average intensity and general direction during the several portions of the day devoted to observation and registry.

2ndly. The hours of the day or night when it commences to blow from a calm, or subsides into one from a breeze.

3rdly. The hours at which any remarkable changes of its direction take place.

4thly. The course which it takes in veering, and the quarter in which it ultimately settles.

5thly. The usual course of *periodical winds*, or such as remarkably prevail during certain seasons, with the law of their diurnal progress both as to direction and intensity—at what hours and by what degrees they commence, attain their maximum, and subside, and through what points of the compass they run in so doing.

6thly. The existence of Crossing Currents at different heights in the atmosphere, as indicated by the course of the clouds in different strata. In observing these, it is advisable to fix the eye by some immoveable object, as some point of a tree or building, the sun, or the moon, otherwise mistakes are apt to arise.

7thly. The times of setting-in of remarkably hot, or cold winds,—the quarters from which they come, and their courses, as connected with the progressive changes in their temperature.

8thly. The connexion of rainy, cloudy, or fair weather, with the quarter from which the wind blows or has blown, for some time previous.

9thly. The usual character of the winds as to moisture or

dryness, not as deduced from mere opinion or vague estimation, but from actual observation of the hygrometic state of the atmosphere during their prevalence.

Among these particulars it will be seen that some are of a nature susceptible of daily observation and registry, while others call for an exercise of the combining and inductive faculty on the observer's part, and cannot be made out otherwise than by continued attention and habitual notice of phænomena with a view to the investigation of their laws. The general impression left upon the mind as to any of the points of this kind above enumerated, by the occurrences of the past month, will therefore be more properly stated, in the way of summary remarks at the end of the Monthly Registers, than as entries under particular days.

Of the state of the Sky.

In describing the state of the sky as to clouds, &c. the observer will bear in mind that it is only in that region of the sky which is vertically above him that the true forms and outlines of the clouds are exhibited, and the area they cover, as well as the intervals between them distinctly seen. As they approach the horizon in any direction, their extent is foreshortened by perspective, their apparent magnitude diminished by distance, and their intervals covered in and hidden by their mutual interposition. In estimating therefore the quantity of clouds in the sky, regard must be had to this, and our judgment should rather be formed on a view of the region extending from the zenith every way half way down to the horizon, than from the aspect of the heavens below that limit. It would be better to notice both, and state, separately, the proportions in which each are covered, and the quarter of the horizon towards which the chief masses in the lower region lie.

The general aspect of Clouds, as classed under the heads Cumulus, Cirrus, Stratus, &c. should be noticed, and especially the height of their inferior surfaces, or the level of the *vapour plane*, should be estimated. In a mountainous region this is easy, so long as the vapour plane is below or not far above the summits of the hills, and in such regions the formation and dissipation of cloud in the neighbourhood of the mountain summits, under the influence of certain winds, form a subject of study of a highly curious and interesting nature.

The formation of Clouds at night, during calm weather, under the influence of a gradually descending temperature, is another point worthy of attention. It frequently happens, that, without any perceptible wind, the sky will suddenly become hazy in some one point, and the haze condensing and spreading,

in all directions, without a wind, the whole heaven will become overcast in a remarkably short time. The same thing will sometimes occur nearly at the same hour for many nights in succession. Such phænomena should be noted whenever they occur.

Two or even three strata of clouds are very common in this district of South Africa. The lowest frequently resting immediately on the land and sea. The height and thickness of these strata, their connexion with cross or opposite currents of wind in the regions where they subsist, and the laws of their formation and gradual inter-mixture, deserve to be studied with care, and with reference to the hygrometic state of the air at the time and place, and for several hours before and after.

Of Thunder and Lightning, and of the Electrical state of the Air.

Connected with this part of the subject is the observation of shooting Stars and luminous Meteors. Remarkable ones should be noticed, and the moment of their appearance, their direction, duration, length of path, and *course among the Stars*, ascertained and noted, with the phænomena of their increase and decay of light, apparent size, separation into parts, trains left behind, &c. The *general* direction (if any) which they observe on particular nights, is a point also to be attended to. Such are the frequency and brilliancy of these splendid phænomena in the clear sky of this Colony, that there can be no doubt of their affording an available method of ascertaining the differences of longitude of the most distant stations, if duly observed by persons furnished with means of ascertaining the time.

Thunder storms of course will be noticed when they occur under the general head of the weather, but it is of consequence also to notice distant lightning, not accompanied with thunder audible at the place of observation (by reason of its great distance),* especially if it takes place many days in succession, and to note the quarter of the horizon where it appears, and the extent it embraces. In an actual thunder storm, especial notice should be taken of the quantity of rain that falls, and of the fits or intermittances of its fall, as corresponding, or not, to great bursts of lightning, as also of the direction of the wind and the apparent progress of the storm with or against it.

Observations of the Electrical state of the Air in serene weather are unfortunately too much neglected. The apparatus

* Thunder can scarcely ever be heard more than 20 or 30 miles from the flash which produces it. Lightning on the other hand may be seen (or at least its reflexion on the clouds, forming what is called *sheet lightning*) at the distance of 150 or 200 miles.

they require is simple, and by no means costly, and may be constructed indeed by any one for himself with ease.

If the Committee in this their first Report do not dilate on this and other of the less usually practised observations of Meteorology, it is because they wish for the present chiefly to call attention to the accumulation of regular and daily observations of a more definite and numerical character. With this view they have drawn up, and by the liberal aid of Government, have procured to be printed skeleton forms, of which a copy is annexed, for immediate distribution among such Correspondents of the Institution, and others, as may be willing to undertake their filling up. These comprise, it is true, only the registers of the Barometer and its attached Thermometer, with that of the external Thermometer, and a column of Remark for Wind and Weather, as being the most essential and indispensable elements of Meteorology, but it is in the power of any one who pleases so supply additional information, and to those who have leisure, instruments, and inclination for the task, the Committee would particularly recommend the regular observation of the Wet Thermometer, those of the Self-registering Thermometer, and Weekly or Monthly Observations of Thermometers buried at different and progressive depths beneath the surface of the soil.

The printed forms provide for the arithmetical convenience of casting up the *means* for each month. In doing so it is requested that care will be taken to verify the results by repetition, and (that usual sources of error may not escape notice) they recommend in every instance, before adding up the columns, to look down each to see that no obvious error of entry (as of an inch in the barometer, a very common error, or what is more difficult of detection, an error in the first decimal place) shall remain to vitiate the mean result. It is perhaps unnecessary to more than mention the precaution of *counting* the days in *each* column on which observations occur, so as to admit of no mistake in the *divisor*, and to use throughout the decimal arithmetic in calculating the mean results. Care and exactness in these points will in most cases add greatly to the value of the communications, as it will be quite impracticable for the Committee, should observations flow in masses, unreduced or erroneously reduced, to undertake the overwhelming task of recomputing them.

Although not, strictly speaking, a branch of meteorology, yet as the collection of observations of the Tides has been made a part of the duties of your Committee, they propose the following stations as points where it would be especially desirable to obtain regular observations of the time and height of high and low water, according to the rules and on the plan proposed by

Mr. Whewell, in his late researches on this subject, and they earnestly invite communications on this head from any residents at those ports who may have leisure and take interest enough in the important questions connected with the subject.

Cape Town,	Port Elizabeth,
Simon's Bay,	Knysna,
Saldanha Bay.	
Ascension,	Tristan d'Acunha,
Mauritius,	Madagascar,
Mozambique.	

In Cape Town and Simon's Bay, they have the pleasure to report, that a series of observations, under the superintendence of Captain Bance and Mr. Levien, have already been undertaken at the instance of the Astronomer Royal, and are now in active progress.

On VACCINATION.

By Dr. MURRAY.

[*Read at the South African Literary Institution.*]

As no Scientific Investigation ought to be foreign to the Members of this Institution, I would beg to call their attention to the subject of Vaccination, which is one of such very great importance to the community, that every plausible suggestion tending to perfect our knowledge and practice of it, should be taken into consideration.

I need scarcely mention what must be well known to you all, that of late it has rather got into discredit, from having been found to fail in affording universal and absolute protection against the contagion of Small-Pox; and that, although some of the causes which operate to prevent its full antivariolous effect on the constitution have been discovered and pointed out, there are others which seem not to be perfectly understood, for many of those persons who have passed through the Vaccine-Pox apparently in a regular manner, and under circumstances that have been considered favourable, have, nevertheless, suffered afterwards, more or less, from Small Pox, when exposed to the influence of its contagion; and hence it is inferred, that some important cause or causes of its failure still remain to be ascertained.

Twenty years ago, Cases of Small-Pox after Vaccination were comparatively rare, and indeed the possibility of the occurrence was scarcely credited or admitted; but since that period it has been fully proved and acknowledged; and,

although it is true, that, in greater number of instances, Small-Pox after Vaccine-Pox has proved an imperfect and mitigated disease, and of a safe nature when compared with regular Small-Pox, yet, in others, it has not appeared to be at all modified by the previous vaccination; and in a few instances it has terminated fatally.

Many of the failures of Vaccination have been traced by Medical Men to such causes as the following,—to the operation having been performed with spurious or deteriorated Virus; or performed when the patient was laboring under some other eruptive or constitutional disorder; to the course of the Vaccine action having been interrupted by the pustules being prematurely broken or punctured; to the whole of the lymph having been abstracted from the pustules for the purpose of communicating the disease to others; to certain conditions of the weather opposing the due action of the virus; and to idiosyncracy or peculiarity existing in particular patients which prevented vaccine assimilation in their constitution, or overcame its protective influence;—but it must be confessed that all these have been considered unsatisfactory in many of the cases; nor can it be admitted that the Virus has become less effectual from passing repeatedly through the human constitution, or that the protective influence diminishes and wears out by time, as some are inclined to assert; for as far as can be observed, the Vaccine Lymph produces the same sensible effects in the present day as it did at the period of its first introduction; and our experience of the permanency of its influence, in the majority of cases, is complete.

I have become impressed with the idea that Vaccination in *very early infancy* is probably a principal cause of its failure, from reflecting upon the known insusceptibility of the infantile constitution to contagion in general; and from having had occasion to observe some very marked instances of its insusceptibility to scarlatina during the prevalence of that disease here in 1830; at which period, although children were chiefly the subjects of its attack, young infants generally enjoyed the privilege of exemption from it, as if their system were insusceptible of the morbific effect of its contagion. Of two families who fell under my particular observation, the youngest of each (babies in arms) entirely escaped, when all the rest of the children were affected; and I heard of many other instances of similar exemption. I myself did not see any child under a year old who took the disease during the whole period of the Epidemic—no such case occurred amongst the Military; and I have not been able to trace more than two or three instances, in civil practice, where infants at the breast became affected, and they were all upwards of eight months old, and had the disease in a very mild form. Hence I was led to infer, that a similar

want of disposition might probably exist in their constitution to the influence of the Vaccine-Pox; and I communicated my opinion to the Director-General of the Army Medical Department at home, with the view of obtaining information, whether in the late Variolous Epidemics in Europe, any difference had been observed in the protection afforded by Vaccination, where it had been performed in very early infancy, and where it had been deferred till after the age of two or three years; and as I thought the information received from the gentleman to whom my paper was referred, was unsatisfactory, I therefore still feel anxious that the subject should be investigated whenever opportunities of observing Epidemic Small-Pox should occur.

The indisposition of very young infants to contagious diseases in general (Hooping-Cough perhaps excepted) has been observed by our most experienced Physicians; and regarding their insusceptibility to Small-Pox, which may be considered to bear the closest affinity to Vaccine-Pox, (if they are not in reality modifications of the same original contagion,) I shall state the opinion of some authors who had the best opportunities of observing this disease in the time of its greatest prevalence and severity before the introduction of Vaccination; and whose testimony is not to be doubted.

Dr. Underwood, who wrote specially on the Diseases of Children, states, that "though the Small-Pox is a complaint so incident to early life, that, comparatively, few children living to the age of 8 or 10 years are found to escape it, yet it is not so readily communicated in the state of early infancy as hath been generally imagined, unless by immediate infection, i. e. by inoculation."--"Every one" he observes "knows how very few infants he has heard of having received the Small-Pox naturally, though fewer of those are inoculated than of children above a year old, and this exemption from the natural Small-Pox does not seem to arise from their not being exposed to the ordinary means of contagion, especially among the lower and middling ranks of people, who form the bulk of mankind:" "The poor furnish frequent instances of the truth of this observation. I have attended where children were born in an air saturated as it were with the miasm of this disease, and even lying continually in a cradle in which another child had died a few days before, and who have nevertheless escaped the disease; and sometimes when they have slept together in the same bed with one loaded with it."

Relative to the tabular account of deaths from Small-Pox, for the years from 1768 to 1774, as collected from the Register of the Collegiate Church, at Manchester, and recorded in the 5th volumn of the Medical Observations and Inquiries, Dr. Percival observes, that "from said document he thinks it may be concluded that Small-Pox rarely occurs to children in the

early part of infancy, experience showing that they are not much predisposed to receive it:"—and this conclusion is confirmed by Mr. Aiken, in his account of the Variolous Epidemic, which raged with great violence in the Town of Warrington, in 1773; as well as by the experience of Dr. Munro, who informs us, in his work on Inoculation, "that of 12 infants whom he inoculated within a fortnight of their birth, not one had the Variolous eruption."

Mr. Kite, of Gravesend, in his paper on Small-Pox, in the transactions of the Medical Society, states, that "he had occasion frequently to observe that very young children had been repeatedly inoculated, and for several weeks constantly exposed to the worst kind of Small-Pox, without any effect; that afterwards the Measles became unusually rife, of a putrid nature, and much more contagious than he ever before or since observed it; that he attended in several families where the young infants (particularly when under two months) were the only part of the family that escaped this disease, although exposed a considerable time to the infectious air, and lying all the night close to children passing through every stage of the complaint, and consequently inhaling into their lungs the very essence of infection; nay, he had been informed of more than one instance, where, in addition, the mother had the disease, and the child, although constantly in her arms, breathing the air reeking with putrid particles, and sucking the milk impregnated with the disease strongly, as we should think, has for months withstood the infection.

This may suffice as authorities upon this point; and in proof of the infantile constitution being often imperfectly affected by vaccination, I would adduce the well-known fact, that many, particularly of those who have been vaccinated at a very early age, have been found susceptible of undergoing different degrees of the disease on re-vaccination, of which I know many instances, and had a very marked one in my own family in 1831–2, when we had an alarm about Small-Pox having appeared amongst the native tribes near the borders of the Colony.

At that time I re-vaccinated my youngest child, when she had attained the age of 20 months, who had been previously vaccinated at the age of 3 months, when she went through the *disease* in a regular manner, at least as far as regards the pustules on the arms, and I considered her vaccination perfect and satisfactory, as dentition had not commenced, and she was not suffering from any cutaneous eruption, and was otherwise quite healthy: however, after re-vaccination the Pocks again came regularly forward, and during the night of the 9th day, I was awoke by her crying and restlessness, and on examination found her in a state of high fever, her skin red and hot, tongue

parched, with great thirst, and her pulse and breathing extremely quick. Forgetting her re-vaccination at the moment, I was alarmed, but on recollecting it, and attributing the fever to this as its most probable cause, I was rather pleased to find such a degree of constitutional disturbance present, considering it as her future safeguard against Small-Pox, to which it must be supposed she would otherwise have been liable.

The efficacy of the Vaccination which has been practised in this Colony has not been much put to the test, in consequence of the absence of Small-Pox, which has never indeed been known to appear as an *Epidemic* (its most infectious form) in this part of Southern Africa. We learn from the Colonial Records that it has existed and spread here to a certain extent, at different periods; but its introduction was distinctly traced, each time, to *imported* contagion. The last time it appeared in the Colony was in 1812, (twenty-two years ago,) when it was introduced from a Slave Ship by some Prize Negroes labouring under it, the Medical Gentlemen appointed to inspect them before landing, having unfortunately mistaken the disease for Chicken-Pox; it then spread to a considerable extent, in a *contagious* or *infectious* manner, but did not become *Epidemic*.

The following Extract of a Letter from Mr. T. K. Deane, the Secretary of the Cape Vaccine Institution, in answer to some inquiries I made respecting Small-Pox and Vaccination in this Colony, is of considerable interest in regard to several points:

"From the time that the Small-Pox last broke out here, viz. on the 15th March 1812, (exactly 11 months after the establishment of the Vaccine Institution,) till the month of July following, when it finally subsided, 240 persons became affected with it, nearly one half of whom died, as the disease was generally of the most virulent kind."

"The good effects of vaccination were perhaps never more conspicuously shown than at the Cape during this period, for out of the whole population, only the number above stated took Small-Pox; and, considering the way in which the Slaves, Malays, and Free-blacks live together, generally from 15 to 20 individuals in one small house, without proper ventilation, or much regard to cleanliness, it is rather to be wondered at that the disease was got under so readily.

"In one small cellar which was visited by the Vaccine Committee, in consequence of Small-Pox having been reported to have made its appearance in it, 27 Malays were found congregated together, and out of these, three were labouring under the disease, which they were endeavouring to conceal for fear of being sent to the Hospital; the remainder were immediately vaccinated, and kept under observation; and of them 11 more became affected with Small-Pox, and 13 took Cow-Pox and

escaped; and I certainly look upon the immediate vaccination which was performed to have been the means of protecting the latter portion of them, as they were all fully exposed to the influence of the Variolous contagion.

"The persons principally attacked with Small-Pox throughout the town, at this epoch, were of this description;—very few cases occurred amongst the better or middling classes, and of these there was not a single attested instance where the party had been previously vaccinated. Amongst the black and colored part of the population, this could not be so well ascertained, but as far as could be traced, none who were attacked had ever undergone Cow-Pox, with one single *doubtful* exception of a Nurse in the Small-Pox Hospital at Paarden Island, who became affected with a mild or modified form of Small-Pox, and who stated that she had been previously vaccinated. She recovered from this attack, but died in six weeks afterwards of a Fever contracted in the same Hospital. As a set off to this case however, and to show that Small-Pox once gone through does not always secure immunity from a second attack, it is stated in the weekly reports made from the Fiscal's Office at that time, of the progress of the disease and result of the cases, of date 10th of July, 'that the two last persons who caught the infection were two elderly men, who had never been vaccinated, but supposed they had had the natural Small Pox at an early period of life;' and in the report of the following week (17th July) it is stated that one of these had died; and that the other, who was conveyed to the Small-Pox Hospital, from having every appearance of Small-Pox, was afterwards found not to be afflicted with Small-Pox, but with a *sort* of Chicken-Pox;"—which was probably *the modified Small-Pox*, or what is called the *Varioloid Disease.*

"To account, in some measure, for the Malays having been the class that more generally suffered, although Vaccination was already general, I must state, that they had a very strong prejudice against the Cow-Pox, and I know it to be a fact, that when government insisted on their being vaccinated, they have been seen to suck each others arms on quitting the Vaccine Institution, to endeavour to do away with the effects of the Virus; but this prejudice has gradually died away, and they now attend the Institution as willingly as any other class of society.

"With regard to persons who have been vaccinated here in *infancy*, and afterwards exposed to Variolous contagion, a number are reported to have taken Small-Pox when they have gone to Europe for education, &c. but to have had it in a very mild or modified degree—of these I personally know eight, and I have heard of several others who became attacked in a similar way on going to India; but of those who were above four

years of age when vaccinated in 1803, when the Cow-Pox Virus was first introduced into this colony, and who have subsequently gone to Europe, &c. not one has ever become affected with Small-Pox as far as I know, and the number that I have ascertained to have been put to this proof is 61; and one of them is a Physician, who had just returned from Europe when the Small-Pox broke out here in 1812, and who was placed in charge of one of the Small-Pox Hospitals then established in Cape Town.

"I would also mention, that when Small-Pox made its appearance in 1812, fifty-four government Slaves were re-vaccinated here as a precautionary measure, although they had all been subjected to the operation the first time the Virus was introduced, in 1803, when they had already attained the age of puberty; and in no instance did the second vaccination take effect, nor did any of them become affected with Small-Pox, although they were on several occasions exposed to its contagion."

The information contained in the above extract, tends in no small degree to confirm my opinion, *that Vaccination will generally be found more certainly efficacious if performed after the period of early infancy;* and, in addition to the other facts and reasoning I have brought forward upon this point, I would advert to the circumstances by which the protective virtue of Cow-Pox was first discovered; and upon which public confidence in it was originally founded and established; which were,—that a certain pustulary or vesicular disease occasionally to be met with on the teats or udders of Cows, was found to be communicable to the hands of the dairy-maids who were employed in milking them, and that the persons who became thus affected with it were for ever afterwards insusceptible of Small-Pox, whether they were inoculated with its Virus, or exposed to its epidemic or contagious influence; and it is not to be overlooked, that these persons must necessarily have been beyond the age of infancy before they could have milked cows.

This notion of the probable constitutional insusceptibility of infants to the Vaccine disease, was referred, amongst others, to the late Mr. Bruce, Surgeon of the Royal Military Assylum; and to Dr. Gregory, of the London Small-Pox Hospital, both men of great experience in Vaccination, and their opinions upon it were transmitted to me.

The purport of Mr. Bruce's observations was, "that young children do not suffer by disturbance in the constitution, from vaccination, so much as older subjects, and that although he had seen the vaccine virus inserted into very young children, by sometimes as many as 10 or 11 punctures in one child, very little commotion of the system has been the result; whereas in adults, the constitution invariably feels more;—he was inclined,

however, to impute failure in early age, more to want of proper attention to the many circumstances upon which perfect and satisfactory vaccination rest, than to the premature age of the subject."

Dr. Gregory said, that "the notion of the insecurity of Cow-Pox depending upon the operation being performed at too early a period of life, is not" (as I supposed) "a novel one, as he had read of it frequently, though he could not put his finger on the author who had mentioned the doctrine—he had probably met with it in Reviews, or Magazines, but the notion had never become popular, because it is neither supported by facts, nor by analogy: allowing the analogy of scarlatina to be in its favor," (which he thought not proved) "he considered that of Small-Pox to be directly against it, as natural Small-Pox occurs just as often to infants as to adults, the susceptibility to that disease being *complete* as soon as the child is born; and it is from a perfect conviction of this fact in pathology, that parents desire and physicians recommend vaccination within the first three months. Had any difference in the protective power of Cow-Pox been observed in those vaccinated at the age of a few months and those in whom the operation had been deferred till three or four years of age," (as queried by me) "it must *necessarily*," he said, "have attracted the notice of parents; and the circumstance of its not being noticed, was, to his mind, *proof satisfactory* that it does not exist. That *time* diminishes the protecting virtue, he held to be a clearly ascertained fact; and, therefore, with regard to the propriety and probable effects of re-vaccination, he was in perfect accordance with me, though he came to the same point by a different route—his belief however is, that the system is as thoroughly *saturable* in infancy as in childhood; and, besides, even supposing infants only a month old to be comparatively insusceptible of receiving Small-Pox or Cow-Pox by inoculation, it does not thence follow that the disease if produced, and if it runs its normal course, should confer less security—in other words, that difficult susceptibility and impaired protective power are not at all necessarily associated."

In regard to Mr. Bruce's observations, I have to say, that although he may probably be very right that failures in early life are more frequently owing to want of proper attention to the other many circumstances upon which perfect and satisfactory vaccination rests, than to the premature age of the subject; yet, as it is according to general experience, that infants suffer *comparatively* very little constitutional disturbance under vaccination, I am inclined to consider this an indication that their constitutions do not thoroughly sympathise, and that they are less perfectly susceptible of the assimilating action of the vaccine disease than those of older subjects, although it is laid

down by Dr. Philip Wilson, in his work on Eruptive Fevers, "that fever is not essential to Cow-Pox, nor even to its preventive effect with respect to Small-Pox;" which is certainly an erroneous doctrine; for as it seems to be proved that the eruptive fever in the exanthemata, is the *cause* of the assimilating process in the system, and not the *effect* of it; so, in Vaccine-Pox, the presence of a febrile state of the body must be considered necessary to produce the process of constitutional assimilation; which process, as being the source of its protective virtue against Small-Pox, ought to be considered the most important feature of the disease, and to ascertain its presence, an object at least equally necessary for determining its validity, as to ascertain that the course of the pocks on the arm has been regular.

I consider this point of so much consequence, that I must trespass on your patience by quoting the opinion of the learned Dr. Curry in regard to it. "On Scarlatina," says he, "the disease may be extinguished by the cold affusion without the specific efflorescence of the skin, or the affection of the throat, by which it seems demonstrated that this efflorescence matter is the product of the eruptive fever, and that the fever itself being destroyed in the first instance, the efflorescent matter is never produced;—so in Small-Pox, the cold affusion if used during the eruptive fever, however severe, instantly abated symptoms and caused the disease to assume a benignant form, thus freeing us from the apprehensions a false theory might suggest, of extinguishing a process by which nature was extricating herself from an acrimony which the system had imbibed, and thus supporting the conclusion, that the eruptive fever of Small-Pox is the cause, and not, as some have supposed, the consequence of the assimilation; and that the diminution of this fever by cool air, and still more by the affusion of cold water, actually diminishes the quantity of matter assimilated.

"Thus, in certain cases, the assimilation might be wholly prevented, but the prevention of the assimilation of Small-Pox in the constitution, by wholly extinguishing the eruptive fever, if it was in our power, would not be advisable, since it must leave the patient exposed to the future influence of contagion."

The following case, related in Johnson's Medical Journal, for 1818, of the progress of the vaccine disease being thus completely arrested, both locally and constitutionally at the sixth day, by immersion in cold water, is interesting.—"A healthy lad was inoculated with the fluid from a fine regularly formed Cow-Pox pustule,—the usual signs of its having taken effect were visible on the third day,—the disease went on favorably till the sixth, and on that day the lad was accidentally thrown from his horse into a pond of water, but sustained no injury except a complete ducking, and the terror necessarily caused

by such an occurrence. On the following day the attendant Surgeon examined the arm, and found, to his surprise, that every trace of the incipient pustule had disappeared. The lad was some time after again vaccinated, and went regularly through the disease."

It thus seems absolutely necessary that a degree of febrile commotion should be excited by vaccination, in order to produce the assimilation of the disease in the constitution, since it would appear that if no fever be excited by it, there will be no constitutional infection, and hence no protection imparted against Small-Pox. It is notorious however, that in the common practice of vaccination, this constitutional fever is rarely, if ever, watched. At public institutions in particular, the patients are not seen more than twice after the operation, i. e. on the fourth day, to ascertain if it has taken effect, and again on the eighth day, the time for abstracting the virus, at which period it can neither be known whether the system will become affected, nor whether a proper areola will be formed; and yet the perfection of the disease is then pronounced upon, if the progress of the pustules has been regular up to that period.

I will not go so far as to say, that some persons have not effectually, and permanently resisted the infection of Small-Pox, in whom no obvious constitutional commotion could be observed after vaccination, for such is affirmed to be the fact; I will say, however, that without this indication, it cannot be considered satisfactory; that full reliance cannot be placed in its prophylactive virtue; and that the constitutions of those who have resisted Small-Pox after vaccination, in whom no assimilative fever occured, were probably insusceptible both of Cow-Pox and Small-Pox infection, (of which there are numerous examples,) although vaccination obtained the credit of protecting them from Small-Pox.

In regard to Dr. Gregory's remarks, I must say, that from his study and experience in Small-Pox and Vaccine-Pox, the profession is disposed to place much confidence in any thing coming from him on the subject; and it is therefore with diffidence that I venture to make any comment upon his opinions, as they must be considered the result of much observation and reflection; but his reasoning and arguments have not convinced me that my notion is altogether so groundless as he would make it appear.

I cannot give in to his opinion that natural Small-Pox attacks infants as readily as older subjects, and "that susceptibility to that disease is *complete* as soon as the child is born," seeing that it is so contrary to the experience and testimony of the unquestionable authorities I have brought forward upon this point; neither can I consider it *proof satisfactory*, that because no difference has hitherto been noticed in the protective

power of Vaccine-Pox, in those vaccinated at a very early age, and where the operation has been deferred till later in life, that no difference does exist, for this is no proof at all.

From the references I have submitted, I think it can scarcely be doubted that the constitutions of very young infants are comparatively indisposed both to natural and inoculated Small-Pox; and the analogy between Small-Pox and Vaccine-Pox is so strong, that there is every reason to suppose, that if the former, which is a more virulent contagion, cannot easily be communicated in that stage of life, the latter will in all probability be even more difficultly communicated; and there is much reason to suspect, that if the constitutional susceptibility be defective, although local disease may be produced by inoculation with the virus, the general system will not become influenced by it, in which case no protective power will be imparted, however regular the local affection may be in its course and appearance.

Dr. Adams, in his work on Morbid Poisons, speaks very decidedly upon this point: —"That some constitutions, or even some parts are insusceptible to a poison at one time, the influence of which they feel at another, and also, that at certain times the part to which a poison is applied is susceptible thereof while the constitution will resist it; and that it is therefore of the greatest consequence to attend to these states of the constitution, as for want of such attention, many, no doubt, have been lulled into a false security regarding their protection against the variolous poison after vaccination."

It is thus that superficial observation may be deceived where local susceptibility alone exists; and I have no doubt, from my own child having taken the vaccine infection twice in the way she did, that her constitution was insusceptible of its influence the first time, although the course of the local disease was normal.

It appears to me that the Vaccine Virus is of so delicate a nature that there are many unsuspected minor causes, which, although they may not entirely prevent its assimilative process, yet interfere so far as to modify its elaboration in the system, and thus *lessen* its protective effect; and my reason for thinking so is, that we find such different degrees of protective power manifested in different persons when brought to the test of re-vaccination, or of exposure to variolous contagion.

I myself have never seen Small-Pox after Vaccine-Pox, but on making the experiment of re-vaccination, which I have done in a number of cases at different periods, from one month to 24 years after the primary operation, I have found the individuals endowed with very different degrees of protective power: in the greater number there was insusceptibility of any local or constitutional vaccine action: in two instances, both vaccinated

in early infancy, (one of which I before mentioned) it was succeeded by regular pocks and constitutional fever; and in a good many it produced irregular festering vesicles, which were sometimes attended with more or less constitutional irritation.

From these experiments I was led to think that the result of exposure to variolous contagion in the persons I re-vaccinated, would have been analogous to that which succeeded re-vaccination; in other words, that in proportion as their constitutions retained their susceptibility to Vaccine-Pox, they would have been susceptible of variolous infection;*—I had every reason however to believe, that the state of perfection of the protective power was not at all altered by the length of interval from the first vaccination, but that it depended entirely upon the degree of saturation imparted by the first operation, for of those who had been vaccinated for upwards of 20 years, I did not find a larger proportion susceptible of Vaccine action, nor that they were more readily, or more severely affected by it, than those who had been only vaccinated for one year.

The present favorite system in England, to improve the security of the constitution against Small-Pox, is *re-vaccination*, founded on the notion of the duration of the vaccine influence in the constitution being *limited*, and of its *wearing out* in the course of a certain number of years; and I am greatly surprised to find Dr. Gregory still abetting this perturbing notion, seeing that it is clearly proved to be unfounded by much direct evidence both before and since the Jennerian era of vaccination.

I am an advocate for re-vaccination, but upon the principle of its perfecting the assimilation of the disease in the system, as I believe the effect of the primary inoculation to be often imperfect and ineffectual, owing to the interference of various causes as above stated; and on this account I would advise it to be practised in cases where it has been deemed expedient to institute vaccination before the age of three or four months; or during dentition; or during the existence of any febrile or cutaneous disorder; or where the course of the disease has been irregular and imperfect. I would also advise it generally, in event of the occurrence of a variolous epidemic, in any place; and in persons who are likely to be much exposed to variolous contagion.

* Mr. Oswald, of the Isle of Man, mentions, that when a varioloid epidemic appeared there, and was found to attack persons who had been previously vaccinated, he prevailed upon some respectable families to submit their children, who had been vaccinated, to variolous inoculation; and the results were similar to those I have stated after re-vaccination. In two individuals, variolous disease with scanty eruptions was produced; in one, the inoculated part became affected, but without any constitutional derangement; and in the others, the virus effected nothing at all.

So many circumstances interfere with the perfect action of vaccina in the constitution, and so important and essential is its perfection for the safety of individuals and the community, that every precaution should be taken to have it observed in the most satisfactory manner; and Mr. Boyce's ingenious and invaluable test of a double inoculation on the fifth day, ought not to be neglected, as it affords a true and positive criterion, whether or not the virus has infected the constitution when the fever is inconsiderable.

The great point, however, which every one wishes to know, is—whether the most perfect impregnation of the system with the vaccine disease affords a complete security against variolous infection? and this I can only answer as a Military practitioner, and as such I can say, that from the universal adoption of vaccination in the army, and from the careful manner we are obliged to observe, note, and report annually upon its effects in every case, Small-Pox has become a very rare disease in our sick returns, whilst the exposure of soldiers to variolous contagion is so frequent and unavoidable, that I think the fabric of vaccination must have been shaken by our experience, if its foundation had not been secure. Dr. Hennen, one of our best Military writers, observes,—"The Small-Pox has raged around our Camps and Barracks, and carried off its victims from under our very walls, and even from the houses where our detached Troops have been quartered, while it has left them unmolested."

It is, however, in the nature of all morbid phenomena, to be liable to objection, and it ought to be borne in mind, that as the most constant and characteristic law of Small-Pox itself, viz. that of its only affecting a person once in life, is frequently violated, so it is therefore quite conformable to analogy, and may be expected, that the most perfect Vaccine-Pox will not in all cases prove a complete security against Small-Pox, nor against re-infection with its own virus; for there are some constitutions in which susceptibility seems to persist, and to overcome the ordinary protecting influence of both vaccine and variolous inoculation. In such constitutions, regular Small-Pox and varioloid eruptions, accompanied with fever, have been known to occur for a second and even for a third time after both regular Small-Pox and Vaccine-Pox.

It is, no doubt, however, from the careless way in which vaccination has often been conducted, and from the opinion first entertained, that its anti-variolous power was absolute in whichever way it was performed, so it was performed at all, that its efficacy is now undervalued by some persons far below its real deserts, and that a check has been given to the practice of vaccination in some parts; but, admitting that it is *not invariably* a secure defence against the inroads of Small-Pox; and that differences of opinion exist upon some particular points

respecting it, the general state of medical and public belief in all countries is, that of those who have been skilfully vaccinated and who have undergone the disease in perfection, only a very small proportion indeed will be found susceptible of any serious infection from variolous contagion.

I am far from meaning, by the foregoing remarks, to excite any distrust in the efficacy of *well conducted vaccination;* on the contrary, I have every confidence in it when followed by its full assimilative action in the system; at the same time I certainly wish to recommend, that the most minute attention should be paid to all the points which have been found necessary for its perfection, as it is most injudicious to maintain the doctrine of its infallibility when irregularly performed and imperfectly observed, since the proofs are undeniable and numerous, that when it is irregular and imperfect in its course, it is certainly not an antidote to variolous infection.

JOHN MURRAY, M.D.

Deputy Inspector-General of Hospitals.

P.S. Since writing the foregoing Paper, I have received the London Medical Gazette, for August last, containing a Report of the results of *Re-vaccination* in the Armies of Prussia and Wirtemberg, which seems to afford very positive proof of the efficacy of this measure in *perfecting* the protective influence of the Vaccine-Pox in the system, and by the remarks of Dr. Gregory on this Report, I perceive that it has obliged him to shift his ground in regard to the doctrine of the vaccine influence suffering a gradual decay in the constitution, and that he now takes up the position, that a decay takes place only at the particular period of life between the ages of 15 and 21; but as these experiments prove the *permanency* and *perfection* of the protective power in a great proportion of those re-vaccinated, to a period of life far beyond that indicated by him, they rather tend, in my opinion, to establish its permanency through life to be the general law, and to show that the effect of the primary vaccination, in a very great proportion of those soldiers, had been originally more or less imperfect.

It cannot be learned from the above report, at what age the primary vaccination of the different soldiers took place, but if this point were attended to when re-vaccination is instituted at any time, or when a variolous epedemic occurs in any place, the validity of the idea thrown out in the foregoing paper would soon be ascertained.

According to my present opinion upon the subject, I would recommend vaccination to be deferred in infants till the fifth or sixth month, i. e. till just before dentition commences, when they are generally freest from cutaneous affections;—and there is another very important reason for deferring it as long as it is

reasonable and convenient to do so, besides that of the infantile constitution being probably insusceptible of receiving the full vaccine influence, which is—that in persons who have not undergone the Vaccine-Pox, inoculation with its virus has been found effectually to arrest Hooping-Cough when it comes to its acme, which is always a most formidable and often a fatal disease to young infants. J. M.

Communications made by a Native respecting a Lake in the Interior of South Africa.

The lad named Moopi, from whom the following notices were procured, visited Cape Town in 1834, in the service of the Rev.— Wright, Missionary at Griqua Town. His age appeared to be about 20. He could converse only in the Sichuana language, and communication was carried on with him by means of a Bichuana youth, who could speak Dutch. Conversations were held with Moopi on two occasions, both the Secretaries of the S. A. L. & S. Institution being present at the first of them, but only one of them at the other. Mr. Wright was present on both occasions, to interpret from the Dutch language into English. It would scarcely be deemed proper to present to the public, information gained through a channel so circuituous, and wherein there are so many chances of mistake, if it were not that the whole communication wears decidedly the aspect of probability, as agreeing with what we know of the adjoining countries, and with what has been gleaned from other sources respecting that to which it refers, and such as it is, the notice may serve to keep alive the interest of the public in a district which seems abundantly deserving of its notice. Several writers have given scanty reports of the existence of a Lake conceived to be to the northward of the Southern Tropic, and near the meridian of Cape L'Agullas. The following communication refers especially to that Lake. In the second examination of Moopi nothing was discovered which varied from his former accounts in regard to the subjects common to them both, except as to the name of a town situate near to the Lake, and of the Chief then ruling it. It must be understood, in general, that the information can be received as precise or of value only in proportion as it refers more or less to those objects to which the attention of men in a state of barbarism is powerfully directed. In regard to the sounds of the names, it is to be observed, that the letter *g* when preceding *h* or following *n* has an aspirated gutteral sound not found in English.

Moopi's communications were to this effect:—He belongs to the Baqueen tribe, and his Chief's name was Sibigho. He first lived at Soohary, from this place he was driven by the Mantatees about eight years ago. That people came from the westward. He and the people fled to Lohahing, a smaller town, about one day's journey north of Soohary. Another attack, under a Chief named Siboutiani, drove them from this place, and they fled to Lihootoon, which is west of Lohahing, where he remained three years. They were driven from Lihootoon by a party of Barolongs, and his people then travelled for twelve months, from place to place, not in a direct line, but traversing from side to side as grass and water were to be found, until they settled in a country near a great water. In this journey they met with no rivers, but found water only in ponds, and the rains were in autumn,—the country is very flat.

They went to a town named Umpooroo. The Chiefs name was Towan. The great water is about two days journey westward of the town. There are towns and cattle posts upon its banks. Close to the town and eastward of it, are mountains which seemed as high as the Table mountain of the Cape. He

saw no snow upon them during the twelve months he was there, but water froze at the town, which did not happen beside the great water. Beside the town, and near the mountains, are many trees; they are not like oaks but more like the pines in the streets of Cape Town. There is a fruit in the country of the size of a peach but it was never eaten. The tribe of Umpooroo have many cattle. They build in the same manner as the Bechuana, dress like them, and speak the same tongue.

Upon the banks of the Lake are found another people, named the Bacoua. They are darker in colour than the former, and speak a different language, and build small ugly huts like the Bushmen. They dress like the Bechuana. The Macowa use boats and navigate the lake: they possess some cattle, but live much on fish. They cut the wood for the boats with iron axes and adzes, and pierce holes with iron tools of their own manufacture. The boats are not hollowed out of trees, but are made of planks fastened together with wooden pins. Moopi had crossed the lake in these boats, and often saw them when drawn upon the beach. They are about eighteen feet long, and 4 or 5 wide, and will carry twelve people. The boats are impelled by means of one long pole, about 10 feet long. Moopi had seen it used, and also in the boats on the shore; only one pole was used. It is round and no where flat, (Moopi showed how they worked with it, and exhibited an action like that of rowing or sculling), it is used near the foreward end of the boat. It was not pushed against the bottom, it came up clean without any mud; and the water is very deep. It is dark coloured, and the bottom cannot be seen. They used no sails. The boat went through the water fast, and when they gained the opposite bank the boat was hauled up on shore. The water of the lake is fresh and good. The fish in it are caught with a hook, he saw no net—when the fish was large and heavy, the Bacowa speared them.

The water rises higher when it rains, but does not rise and fall at other times. When there is wind the waves break on the shore as they do by the sea-beach at Cape Town. It took the boats from 6 to 8 hours to cross it. They could not see across it from either shore, but in the middle they could see land on both sides. Moopi had never gone round the water, either way, but had seen people who came round with cattle by the eastward, and does not know if they can go round the other way. He had heard of another great water to the westward. There are no mountains close by the lake, the shore is low, with reeds and bushes, but no trees. Many rivers fall into it, two of which are wide and deep, and are crossed by means of boats near the lake, where their water runs slow. They are not so wide as the Gariep.

When Moopi was at the cattle post by the water, the sun rose out of the water, and the mountains and the town lay to the right-hand. The sun was across the water at mid-day in the cold season, and when looking at the sun then, the town was on the right: in the hot season the sun came right above overhead,—when he looked north to the water the sun was then behind, it set over a low flat country. Heavy rains came at the end of the warm season. There are no very stormy winds.

The Macowa had copper and iron in their country; he saw no other metal there. They cultivate millet, pumpkins, and Bechuana beans; they also eat wild bulbs. There is only one harvest in the year. He had heard of years of great sickness, when many died.

The Macowa have beads with which they buy and sell,—they are larger than those in this Colony. They do not make them. There are elephants in the country, and a people come to purchase the teeth with beads. They give ten large bunches for a good elephant's tooth. They do not bring knives or any thing but beads. They bring pack-oxen with them, on which they carry their goods. They come from the westward, are two months on their journey before they reach the Macowa,—their oxen are fat when they arrive,—there is grass and water on the road. They do not take away any men for slaves. They are armed with assagais, and go quite naked. They are black, and have curled hair, and are tattooed on the nose and up the forehead like steps. They do not kill their beasts like the Macowa, but cut their throats.

There is no fighting among the people by the lake, but the Dammaras sometimes attack them all. Moopi and his people were driven from this country after resting a year there, by an attack of Mantatees. They fled to the eastward, where they found no water, and many died before they again reached the Bechuana country.

SOUTH AFRICAN
QUARTERLY JOURNAL.
SECOND SERIES.

No. 4. SEPTEMBER, 1835. Part 3.

Remarks on the Logic of Elementary Geometry.—By the Rev. J. ADAMSON, D.D.

[Read at the Institution, June 3, 1835.]

GEOMETRY being that science which investigates the relations of extension, and parts of extension, in all modes according to which extension can be conceived, we have to consider,—

1. What kind of subjects ought to be included in a system of Geometry.

In regard to this it is clear that the subjects ought to be as strictly geometrical as the subjects of a system of Chemistry are chemical, and the absurdity of incumbering the system with any thing extraneous is as great in the one case as in the other. There are numerical relations of magnitudes, or relations of magnitudes expressible by functions of numbers, the investigation of which would evidently be out of place in a system of chemistry, though it be necessary to consider and apply the results of these investigations. If for instance it were necessary to state, in regard to substances which are the objects of chemical analysis, that half the sum of two quantities added to half their difference would afford the larger of the two, the demonstration of this relation would not be thought necessary in the construction of a system of chemical knowledge. It might be done as being required by the state of general knowledge among those for whom the system was prepared, but the argument would be felt and announced to be extraneous, and its occurrence to be an interruption of the logical course of that proceeding in which it is proposed to demonstrate only the effects and relations of chemical affinities. The same ought to be the case in regard to the relations of extension. The demonstration of any truth which is extraneous to the relations of extension, or does not arise from these relations alone, ought in strict logic to be excluded from our procedure. No theorem therefore, of which the hypothesis and conclusion present a relation which is true of magnitude

or quantity in the general or algebraic sense, ought to be considered as claiming a place among our demonstrations. Such relations of quantity, in the general sense, ought to be considered as known and determined, as being portions of another science, prior to their application to the relations of extension, just as they may logically be considered as determined and as requiring no demonstration, prior to their application to the relations of chemical agents. We ought to be concerned with the application alone of such truths, if they enter at all into our consideration; and this application will afford simply a syllogistic statement, that any relation true of magnitude or quantity generally, or in its algebraic sense, is true of extension and its modes or parts.

The principle stated above ought to exclude such treaties as the 5th book of Euclid and various lemmas which are sometimes interspersed among the theorems and sometimes included in the demonstrations. In regard to proportions we should have the application of principles alone and not the proof of them. We require nothing more than a simple test of the existence of equality of ratio among four geometrical quantities. It may also be considered as excluding the first 10 theorems of the 2nd book of Euclid, or these are or ought to become instances of applications of the relations of magnitude generally to geometrical magnitudes; in which we have to exhibit to the eye the occurrence of these relations as existing between portions of superficies. The 5th book, in the form in which it was originally given by Euclid, was probably intended to be of a similar character.

2. Such being the nature of the materials in a system, we have to inquire what ought to be its extent when intended to be Elementary. In regard to this it is clear, that if it were to occupy the same place in science as a system of chemistry or geology, it ought to include all that is known in regard to extension and its modes and relations. But as the science is subdivided into compartments, all of them having certain common principles, an Elementary work which is to be introductory to all of these compartments should contain only the principles common to all. If, however, it is to be introductory to one or more of these compartments in a special degree, it will extend to the principles common to these.

The extent or term therefore of an Elementary treatise on Geometry is to be determined, not as has been stated, by the *order* of those equations which express the relations it includes and demonstrates, but by the nature of those subjects to which it is to lead. If intended to be introductory to all the different branches of Geometry, it ought to contain the truths applicable to all, or those alone from which the different lemmas which

are required as introductory to the separate compartments of the science may be derived. It may then leave these lemmas to form separate introductions to the subjects with which they are related; or, on the other hand, it may contain some of these and not others, or may contain all of them.

The extent, therefore, is nothing more than a matter of general convenience, and appears to be settled by a certain common understanding that the particular branch of the science for which an elementary work should make the most special provision, is the mensuration of figures and solids, of which the elements are planes and circles; while other branches of the science, as Trigonometry, Conic Sections, &c., have generally special lemmas introductory to their subjects.

Such appearing to be the general understanding on the subject, there is no great use in disturbing it. Perhaps the best proceeding is to fix a term or limit for the system, and to construct it of those theorems which lead to that term most naturally. We may, therefore, define an elementary treatise on Geometry, to be a series of theorems leading to the mensuration of figures, bounded by straight lines or circular arcs: of which the terminating theorem should be this—"That a circular circumference includes the greatest surface under a perimeter of given length;" or, if the system extend to the mensuration of solids, the term will be this—"That the spherical surface includes the greatest capacity within a superficies of given extent.

All theorems not subservient to these mensurations, ought logically to be excluded, but the system may be rendered more useful by attaching as appendices to the different books or sections into which the system is divided, ample collections of all those theorems which are of interest or are of importance as introductory to other branches of Geometrical Science, as Trigonometry, Conic Sections, &c. &c.

3. The next inquiry which occurs, is as to the arrangement of the Theorems.

Logical precision and accuracy in argument are indispensable; and, therefore, nothing of a merely geometrical character can be assumed as true which has not been the subject of definition or demonstration. But it is by no means so indispensible, that nothing should be supposed to be done, the method of doing which has not been shown. Euclid has followed this rule only thus far, that no construction should be used, the method of performing which has not been shown. The rule in its more general form cannot be carried into effect. Euclid deviates from it in the very first of his Theorems, where he makes it part of the hypothesis, that two angles are equal. Legendre's postulate is no more illogical than this, in his

analytic method of proving that the angles in a triangle are equal to two right angles, when he rests it on the possibility that two triangles may exist, of which two angles are equal each to each. Problems are the practice resulting from theory, and should be considered separately, when the theory is fully established.

The only thing which the strictest logic requires in regard to construction is this:—that every thing done should be indicated as possible; this will generally be best effected by a corollary from the theorem on which the performance depends.

In other respects the arrangement ought to be of the most natural order possible, using the word in the sense indicated in *Natural* systems of Botany as distinguished from *artificial* system. This is an exceeding advantage, both in regard to the right apprehension of the subjects presented, and in regard to facility of retaining and recalling the information acquired. The arrangement may become to the mind a sort of formula, by means of which the whole truths relating to any object are at once presented and brought under review, and it seems even better, if it were necessary, to deviate from logical perfection in reasoning, so far as to prefer an inferior or more clumsy method of demonstration, rather than to deviate from the strictness of a natural arrangement. It cannot be doubted that every one who uses geometrical truths as the means of further investigation, does form some such natural arrangement to himself, which really is his guide in his progress. But the advantages of having this originally done well and logically, are evidently great; there may be some difficulty in managing it, but the difficulty must give way before endeavours directed by this conviction,—that the positions stated are true, and that the reasons of their truth may always be discovered without interference with objects of a different character.

In conformity with these principles, the theorems ought to be arranged according to the natural relations of their subjects, and not according to the methods employed in the investigations. Thus the application of the doctrine of proportion, as it is called, ought not to be the ground of sub-division, as in Euclid and many other systems.

4. Our fourth inquiry will be, respecting the nature and demonstration of Theorems.

As the investigation of relations belonging to another science ought to have no place in a system of Geometry, and as subjects in the system ought to be arranged naturally, so ought the theorems relating to one subject be kept uninterrupted by any argument relating to subjects of a different character. Thus the arrangement in Legendre is defective, when in Book VI. Theor. 21, while investigating the relations of solids,

our attention is withdrawn to the investigation of a property of Plane Triangles; this ought to have been settled in its natural place, (*i.e.*) with the other truths relating to plane figures. Euclid's investigations are on the whole free from this defect; but the reverse is the case, as might be expected, with regard to those who have added Supplements to his Books, because Euclid's Elements do not always afford sufficient lemmas for their arguments.

Truths are presented to us either in axioms or definitions or theorems or corollaries, and it may be well to distinguish what ought to be our idea of these things.

Axioms are said to be self evident truths; which perhaps means, those of which the certainty is intimated in the logical definition of the terms employed. I should rather say, that axioms are truths relating to quantity generally, or are the relations of magnitude common to all its modes and kinds, and are therefore either theorems or definitions. Belonging to the latter class, are such as "The whole is equal to all its parts, or is greater than any of its parts," &c. &c. and among the axiomic theorems ought to be included, all the relations expressible by numbers or functions of numbers which it is intended to make use of, such as the one before mentioned, that half the sum added to half their difference makes the greater of two quantities, which is, it is obvious, as much an axiom with regard to geometrical relations as "that things equal to the same are equal to each other." The same is the fact in regard to such truths as this—that "proportional quantities taken alternately are proportional," and all of the same kind—every thing Algebraic is axiomic in regard to Geometry, and nothing strictly geometrical can be an axiom.

A definition is an announcement of a single property of an object which distinguishes it from all other objects. A definition cannot include two independent properties, for this would present two definitions, since it requires demonstration that both characterise or belong to the same thing. Since the aim of our demonstrations is to establish the properties of objects or combinations of objects as distinguished from others, they must all be deduced from those which characterise or distinguish the individuals. Hence the definition is the single original or elementary hypothesis in all demonstration. This rule is violated in the common method of deducing the properties of parallel lines; part of them are derived from the definition that,—"Parallel lines never meet," and part from another definition, viz: That parallel lines are such that only one line so related to another can pass through any point. This latter is called an axiom, in the form given by Playfair, viz: "That two straight lines which meet cannot be parallel to the same." But giving it this name does not make it an axiom, or make it cease to be a sufficient

definition of parallels, and no one has shown that these two definitions describe the same thing. In all methods which I have seen, the object is either imperfectly accomplished or else this error is committed, that there are two definitions assumed, or the definition includes two properties.

Since a definition is to consist of a single property of any object, if there be several properties susceptible of independent enunciation, it is a matter of indifference as to the precision of our reasoning which of them is assumed as the definition. Thus assuming as the definition of a triangle, that it is a figure with three sides, we may deduce from that fact, another, viz. that its angles are equal to two right angles: but it would be equally logical to reverse the process, taking the latter fact as the definition, and making it a matter of demonstration that the figure must have three sides. It is not enough, then, to object to a definition that it may be demonstrated, or that it requires demonstration: every property may be demonstrated and requires demonstration, when some other is assumed as the hypothesis or made the definition. The only circumstance, then, which ought to guide us in our choice, is the ease or difficulty of enunciating the property, and of making it the ground of reasoning The first of these circumstances is of comparatively little importance, except that a useful definition ought to be short and plain; but the second circumstance is deserving of every attention. There are, for instance, two properties of straight lines, either of which it is perfectly logical to choose as distinguishing it, they are— 1. Universal coincidence when two points coincide. 2. Being shorter than any other line connecting two points. Assuming either as our definition, it can be demonstrated that the other is the property of the object so defined: but as a matter of convenience, we ought to adopt the latter one as the definition, on this account that the other is instantly deduced from it; if we reverse the process, we do not get at our conclusion with respect to its minimum length till we consider lines as boundaries of figures, and till we have demonstrated several properties of figures. The only question then which requires consideration in our selection of a definition is simply this: What property affords the most convenient hypothesis? If such a course do not dispel all difficulty from our proceeding in any instance, it does at least clearly set forth wherein the difficulties lies. We will see, for instance, that the difficulty in respect to parallel lines may be obviated by a rightly chosen definition of them, to constitute an original hypothesis; which is its use. The difficulty is perfectly independent of any definition of the *term* by which the relation is indicated, it consists really in the nature of the hypothesis on which we have to reason. It is easily demonstrated that two straight lines equally inclined to another towards its

same extremity will never meet, but the converse of this has proved universally a stumbling block, viz.—if there be two straight lines which never meet they are equally inclined to a third line meeting them. The hypothesis in this case is singularly unfit for being the foundation of an inference, inasmuch as the position "that they never meet" cannot be presented in a distinct form to the mind, nor is it in any way the object of representation: it can neither be thought nor figured. The conclusion cannot be deduced but by reasoning of this nature: the only reason of the inequality of the angles is, that the lines meet at a finite distance,—but they do not meet at a finite distance, therefore any reason that would show the one to be the greater would also show the other to be the greater.

The property of parallels, however, which is here assumed as the definition, is, in comparison with all others, of the least practical value, and we do not see how it should have been intruded as the test of parallelism, except for a reason purely theoretic, that is to say, to conceal without overcoming, a difficulty occurring in the process of reasoning. After all, it is very remarkable, that there should be so much difficulty in giving a reason for a position so simple as this, viz. that straight lines equally inclined to one straight line are also equally inclined to any other. There seems something wanting in regard to the position of lines which needs previous elucidation. That elucidation ought to be presented in definitions—but they, in regard to this matter, are very deficient. The thing understood by the term *angle* is not defined at all, by any words representing it as a species of magnitude or mode of extension. We have no commonly recognised general term, to which we can refer it, as we have in the case of the word *line*, which is referable to the general term *length*; nor does it seem to me that *angle* can be defined at all, so as to admit of reasoning on the definition of it, without introducing the idea of revolution, which thus becomes a general term to *angle* as *length* does to *line*. It is absurd to object to this, as introducing an idea not logically connected with the subject, insomuch as revolution implies *motion*. We must reason on our rational conceptions, and it will be found that the conception of motion has a necessary connection with ideas of difference of magnitude in extension; and therefore, though avoided in words, cannot be excluded from among the elementary hypotheses of geometrical reasoning. Even Euclid talks of the *production* of a line, and others speak of the *opening* between two lines. The idea of motion, however, should be only introduced in reference to a changed state or position, and not in reference to a changing one.

Perhaps the difficulty above-mentioned may be obviated in the following method:

Definition. The position of one straight line in regard to another is determined by the angle of inclination, or by that angle which is formed when the lines are produced till they meet.

Definition. When the adjacent angles so formed are equal the position is perpendicular.

Hence, all perpendiculars to a line have the same position in respect of it.

Hence, all portions of any straight line have the same position in respect of any other straight line, or have the same inclination to it.

Definition. The complement of inclination is the angle formed by any straight line, having a given position in respect to another, with the perpendicular to that other.

Hence, since the position of every part of a straight line in respect to another is the same, the complement of the inclination is every where the same.

Hence, all straight lines perpendicular to one straight line are equally inclined to every other which intersects them.

However, in regard to parallels, we are not logically restricted to one definition, but are bound to choose that which is most convenient as the foundation for argument. Of the two which I have mentioned as being commonly and illogically employed, it is far more convenient to choose the latter, or rather the converse of it, and to announce it in this form as our original hypothesis, viz. Parallel straight lines are such that all straight lines passing through a point in the one will meet the other. From this the whole system of properties may be logically evolved. It can by a short demonstration be extended to this form, viz. Lines are parallel when every straight line which meets the one also meets the other: and the test of parallelism in this form has two advantages; it is a property constantly occurring in geometrical reasoning, while the other occurs comparatively seldom; and it enables us to establish the properties of parallels in which angles alone are concerned, without interfering with figures.

Theorems may be of two sorts, according as the hypothesis is single or compound. In all of those which are derived directly from the definitions, the hypothesis must be single, and in all cases when the general relations of quantity are applied to geometrical magnitudes the hypothesis is single. These ought perhaps to be considered as corollaries or axioms rather than theorems; and a theorem ought to be a conclusion derived from at least a two-fold hypothesis (i. e.) it will present some property of a compound object of which the elements are two objects having separate definitions: thus—if parallel straight lines intersect a circumference, the definition of parallelism is combined with that of a circle, to establish a property belonging to a compound object. A strictly geometrical theorem ought

CHAPTER I. Extension in Lines.	Book I	Angles	1	Angles at one point
			2	Angles at two points, viz. parallel lines.
			3	Angles at more than two points, viz. angles of figures.
	Book II	Straight lines.	1	Sides of triangles, (a, excess and equality as to general forms (b, particular do. as Isosceles, &c. (c) other relations (i.e.) proportions [Scholium Plane Trigonometry
			2	Sides of quadrilaterals.
			4	Sides of polygons.
	Book III	Arcs or Circumferences	1	Angles in relation to arcs.
			2	Straight lines, intersecting or forming figures, (a) Chords, tangts (b) Figures formed of such.
			3	Arcs compared with straight lines as to length and proportion.
	Term of this Chapter "Arcs s			in the ratio compounded of the se of their radii and angles.
CHAPTER II. Extension in surface.	Book IV.	Rectilineal surfaces.	1	Rectangular surfaces or areas, (a) Equality (b) other proportions
			2	Non-rectangular surfaces or areas, (a) Equality, (b) other ditto.
	Book V.	Circular surfaces.	1	Circular surfaces or areas compared with the like
			2	Circular surfaces or areas compared with rectilineal
	Term of this Chapter or of Plane			Geometry "The Circle contains t greatest area in a given perimeter."
CHAPTER III. Extension in capacity.	Book VI.	Planes not inclosing spaces	1	Lines intersecting planes
			2	Planes intersecting planes, (a) Two planes intersecting, (b) more than two = solid angles, scholium spherical trigonometry.
	Book VII.	Surfaces inclosing spaces, or boundaries of solids.	1	Plane surfaces.
			2	Curved surfaces (i.e.) Cylindric, cone, spheric, surfaces.
	Book VIII.	Solids as to capacity, contained by planes.	1	Rectangular parallelopipeds.
			2	Non-rectangular parallelopipeds.
			3	Pyramids.
			4	Polygonal solids
	Book IX.	Solids under curved boundaries.	1	Cylindric, as functions of (a external surface, (b base and altitude, (c generating figure
			2	Cone do do.
			3	Spheric do. do
	Term of the whole "A Sphere			contains the greatest capacity within a given surface."

thus to present to us a deduction from at least two strictly geometrical hypotheses. The others may in contradistinction be called axiomic theorems. In regard to them the following is the circumstance of chief interest: If there be a set of truths relating to quantity generally, and such that any one may serve as a hypothesis from which the others may be derived, it is a matter of importance to ascertain the best method of applying them to geometrical magnitudes. It is sufficient, if we show that one of the series is true of a set of geometrical magnitudes: such a theorem might be geometric, but the others relative to the same set of truths would be axiomic. It is of no importance logically with which one of the series we commence. We can be influenced in our choice only by convenience and propriety of arrangement. The theorems relating to proportion or the equality of two quotients from a series of this character. It matters nothing whether we call this selected one, by means of which the others are rendered applicable, a *definition* of proportion or a *theorem*, our business with it is to show that it forms a connecting link between quantity in the general or algebraic sense and geometrical quantities, and we have to choose that one which most readily connects them.

Thus, having established the relation between algebraic products and the rectangles contained by straight lines, we might infer that the containing sides have all the relations and properties of proportional quantities, when two rectangles are equal; and thus we have a test of the ratios of geometric magnitudes. This is a method, however, which would not answer our purpose in a natural arrangement, because it would interpose relations of superficies, among those relations of lines only, which ought to precede them. In the comparison of geometrical quantities prior to the introduction of ratios generally, our attention is directed only to the relations of equality and difference,—and the adoption of this course is indispensable,—since the relations of ratios of quantities or the relations of quotients, could not in any case be established, without establishing relations of equality as a first step. It hence follows, that that property of proportion in which we are called to the contemplation of equality or excess, is naturally the most easily available. It seems to me, among the most remarkable and most interesting facts in the history of geometry, that the discovery of a property of this character appears to have been among the earliest objects and earliest results of geometrical investigation.

It does by no means seem a very obvious course of proceeding that we should investigate the equality of quotients by considering the equality or difference of quantities. This,

however, is the course proposed by Euclid in his 5th def. book 5, and its peculiar excellence is this, that to investigate the equality of quotients, the relations of number are dismissed from the mind in that comparison of two geometrical magnitudes which it is called upon to make. The employment of number is only a preparatory step, and in drawing the conclusion our attention is entirely confined to the inquiry whether there be an excess of one quantity above another. Perhaps this method of investigation led Euclid to his definition of ratio in terms not strictly applicable to it, when he called it a relation of *quantity* or magnitude, whereas it is undoubtedly a relation of *quotity* or number, taking these terms in their most general sense, as including the ratio of any functions of numbers whether commensurable or incommensurable, as $n\sqrt{2} : m\sqrt{3}$ &c. One of the earliest efforts of geometry undoubtedly would be to demonstrate the relations of the parts of a field, a house, or a city, by means of a figure drawn on a board or in the sand, and nothing else could occupy the mind but the relations of determinate numbers. The properties and relations of quantities must have been long and deeply studied, before the existence of incommensurables could be suggested. In fact, we do not see how it could have been suggested at all, except in the investigation of the properties of figures, by the discovery that there were relations among parts of them, which the ratios of rational numbers could not express, this I think necessarily implies the previous investigation of those which they can express.

Rendering the discovery of such relations as are indicated by equal ratios dependent on the occurrence of excess or difference, is therefore a recondite process, and would probably be reached only by many endeavours, and Euclid's definition may therefore be considered as a generalization from many previous rules, or a reduction to unity and simplicity of the consequences of many previous inquiries. Perhaps the peculiar method of arithmetical notation employed by the ancient geometers aided in the discovery of the rule. To reduce the investigations of relations implying quotity to those of relations implying excess only, is, however, the very process which is most convenient for demonstrating that such relations exist between geometric quantities; and so far Euclid's process is perfect. But I do not think that either Euclid or his Commentators have succeeded in the logical announcement of the rule. It has been considered an excellence in its character, that the rule in its common form is applicable both to commensurable and incommensurable quantities, but the truth is, that it is a somewhat illogical combination of two rules, one of which is applicable only to commensurable quantities, and the other is

applicable to quantities whether commensurable or incommensurable. The former part ought therefore to be rejected. The rule thus purified of extraneous matter will be—if, when equimultiples are taken of the alternate terms of four quantities, it be found that those numbers which make the multiple of the first greater than that of the second, do also make the multiple of the third greater than that of the fourth, then these quantities are proportionals; or, if m A $\supset$ n B when m C $\supset$ n D $\therefore$ A : B = C : D or $\frac{A}{B} = \frac{C}{D}$ To proceed logically, we must of course produce a demonstration of this, which is not difficult, the converse however is much easier, and is all that seems to be attempted in the elucidation of this subject, in the notes to Playfair's Elements.

It is well known that every theorem has its converse, in which the conclusion of the theorem is converted into the hypothesis, and the former hypothesis becomes the conclusion. By this it is shown, that if a property belong to an object and distinguish and characterize it as an individual among other objects, that property cannot belong to these others. This then necessarily follows, that no theorem logically stated, can be true without the converse also being true. The converse is in this point of view, reduced to the character of an identical proposition with the theorem, and, except the peculiar importance of the truth, and its frequent application, induce us to act otherwise, ought always to be stated as a corollary to the theorem. The proof will be indirect, and will consist of a very short statement, showing that the theorem cannot be true when the converse is denied. Apparent anomalies in regard to the rule now stated, arise from illogical statements of the theorems which seem to present them. In the hypothesis of a theorem, no condition ought to be superfluous or unnecessary as a foundation of the conclusion, and the conclusion ought to be the whole truth which the demonstration makes to rest upon the hypothesis. When any other particulars in either case are rejected or admitted, the theorem is illogically stated, and then the converse will, for that reason, be untrue. Of the accuracy of this position we will easily be convinced by an analysis of any theorem in which the converse seems to be untrue—1st. As to those in which only one geometrical fact is used as the hypothesis, we have this example, "similar polygons have their perimeters in the ratio of their homologous sides," the converse of which as thus stated is not true; but there is a superfluous condition in the hypothesis, viz: that which relates to the angles. Excluding this condition, the theorem may be stated thus:—When polygons have proportional sides, their perimeters are as their homologous sides. Now, it is not accurate to say—"Conversely: if perimeters of polygons have

the ratio of two homologous sides, their sides are proportional;" this assertion, however, is not the converse of the theorem, but the converse really is:—If the perimeter be as any two, or rather as every two corresponding sides, the sides then are proportional: which is true. The proposition, however, can scarcely be said to be a geometric theorem, at least, it is axiomic only, or is a corollary from the theorem whatever it may be, which establishes the occurrence of the relations of proportion among geometric quantities.—2nd. If the hypothesis of a theorem has its proper character of comprizing two or more geometric truths, then the converse is at least two fold. There are in fact three or more truths mutually dependant, of which any two may constitute a hypothesis, to afford the other as a conclusion, and the truth of them all is certain, if one be demonstrated. Thus in an isosceles triangle, a line may be drawn so as to fulfil these conditions, viz: being perpendicular to the base, besecting the base, and besecting the vertical angle. There are here four conditions mutually related, and if any two be made a hypothesis, the other two arise from it as conclusion; so that we have as many theorems as are afforded by combining four things, two and two, or six theorems, each converse to the others, and all are true; but none would be true, if only a single one of these four conditions be assumed as hypothesis; and it is at once seen that no such assertion in this case forms the proper converse in regard to any of the theorems. In all cases, therefore, we must have respect to the number of conditions contained in the hypothesis, and established in the conclusion, before we are entitled to say—we have announced the converse of the proposition. Thus when we assert the fact, that two triangles having respectively equal sides, have also equal angles, we cannot assume as the converse of this:—that those having respectively equal angles have also equal sides, because the fact stated as the original conclusion in this case is only partially the conclusion, it is rather a deduction or a corollary from the real conclusion than the conclusion itself, which is, that the triangles will coincide, or are in every respect equal: it is, therefore, as much the conclusion, that the areas are equal, or that perpendiculars from the angles respectively in each are equal, as it is, that the angles are equal; take, therefore, the whole conclusion and make it the hypothesis, and we have the real converse of the theorem, and it is true.

The only thing we have now to settle in regard to the nature of theorems, is the distinction between them and the corollaries. A corollary is generally understood to be that which follows from a theorem, without need of farther demonstration. Now these terms are somewhat indefinite, as it may not be easy to say

what needs demonstration; and the rule as depending on this character is by no means generally observed. Perhaps the following is better, viz: that a corollary is a truth which is derived from a theorem by a syllogistic statement only; which implies that no new truth is introduced into the hypothesis, to be combined with those existing in it; but that the conditions constituting the hypothesis or conclusion, vary in their relations among themselves. Thus having demonstrated that the three interior angles of a triangle are equal to two right angles, it is a corollary according to this definition, that when these angles are equal each to each, one of them is two-thirds of a right angle; but it is not a corollary, to found upon this theorem the inference that the exterior angles of a figure are equal to four right angles; for in this case, both the data and conclusion vary absolutely; and the position ought to be a theorem. Under the same term "corollary" will also be included, the case where the conclusion is presented to us, in its nature identical with the assertion of the theorem but differing in expression. So also in accordance with this definition, a corollary may be the statement of a practical result, the performance of which depends on the truth developed in the theorem.

5. Our last inquiry will be respecting the methods of demonstration

There seems to be some misconception in regard to this subject also, which it is of importance to correct. We may make the demonstration of most theorems to be direct or indirect just as we choose—there is involved in this distinction nothing more than a difference of language; and, therefore, there is logically no reason of preference for the one beyond the other. We may either make the truth we are demonstrating, to be an undeniable inference from things demonstrated before, or we may shew the denial of our position to be contradictory to truths demonstrated before. That one of the two methods which is shortest and most distinct in any given case is to be prefered, and there ought to be no other ground of preference. In one series of cases the indirect method is distinctly preferable, and that is,—whenever the converse of a theorem is to be deduced from it. In demonstrating those also, which are derived directly from definitions, the object being to show that denying the theorem is contradictory to the definition, recourse must in general be had to the indirect method.

Our whole decisions in regard to the ratio of quantities depend, as I have said, on the establishment of ratios of equality in certain cases, and, therefore, our method of proceeding in all cases will ultimately depend on the nature of those conceptions by which equality is suggested or ascertained. Now, in regard to geometrical magnitudes, this conception involves in it

the coincidence of limits or boundaries. We cannot conceive the equality of straight lines, &c. independent of the conception of coincident limits, or without entertaining the position that the objects may be conceived to coincide; and there is, therefore, nothing illogical in the idea of supraposition. In fact, the method of ascertaining such truths by conceiving the application of one object to another, instead of being objectionable, in many cases is the most natural and advantageous.

In regard, for instance, to the four theorems in which we demonstrate the equality of certain parts of triangles, it seems preferable in all of these to employ the method of supraposition rather than to restrict it to one case, and then derive the other three from that one; the necessity of having recourse to this method is established as clearly by adopting it in one case as by doing so in all. It must be made the source of our knowledge on the subject; this cannot be avoided, and it does not seem of any use to avoid if it were possible. There is an advantage in adopting uniformity of proceeding in all the cases, insomuch as we show more distinctly the necessary variation in the nature of the result from the variation of the conditions on which it rests, and this seems to me to prepare the pupil for discovering in his subsequent proceedings, whether one or an other of these rules is most conveniently applicable.

In conformity with positions which I have endeavoured to illustrate, I would propose to arrange a course of Elementary Geometry as follows:

On the probable importance of Tide Observations at the Cape of Good Hope. By the Rev. W. Whewell, Fellow of Trinity College, Cambridge.

[Communicated by Sir John Herschell, Bart., President of the South African Literary and Scientific Institution, and read on 6th May, 1835.]

1. It appears to be quite certain, from the general course of the times of high water on the shores of the Atlantic, that the tide comes to Europe from the Southern Ocean. For the tide hour on any day is later and later as we proceed from the Cape of Good Hope along the shores of Africa, Spain, France, and England. Therefore, considering the matter merely in this general manner, it would be very desirable to know the exact time of high water at the Cape, that we know how long the *tide wave* (for the tide may be imagined travelling like a vast wave) takes to travel from the south point of Africa to any part of Europe.

2. The tide wave employs about 24 hours in moving from Cape Town to London. But it may be asked, where does it come from, to Cape Town? What is its birth-place? To answer this question, as far as it admits of an answer, is one of the objects for which good tide observations at the Cape are very desirable. But this requires some explanation.

If the tide employs 24 hours in going from the Cape to London, it must at London be 24 hours *older* than it was at the Cape. But what indication have we how old the tide is? We have two such indications: I will explain them in order.

3. The highest spring tide *corresponds* to the full and new moon; but it does not happen *on* the day of full or new moon; it happens a day or two or three days later. Why is this? Apparently it is, because the tide has employed a day, or two, or three days, in getting from the place when it was born to the place when it is observed. The greatest tide is born on Monday, the day of the full moon, in the Southern Ocean; but this greatest tide does not reach London till Wednesday or Thursday, two or three days after the full moon. And thus the highest spring tide is always some days after the new or full moon, which occasions it.

This account seems plausible: but if it be true, the greatest spring tide must arrive at the Cape a day sooner then it arrives at London. If the highest tide happen at London on Wednesday, it must happen at the Cape on Tuesday. If at London it be always two days after new or full moon, at the Cape it must be always one day only after that occurrence.

This, therefore, is one main point to which the attention of the tide observers at the Cape should be directed. On what day of the moon's age is the highest high water? But this inquiry requires some additional cautions to make the answer of much value. One or two spring tides merely compared with the preceding and setting tides, and with the moon's age, would not give us the accuracy which we want; and which, with a little additional attention, we can get.

4. In the first place it is a very rough way of reckoning, to talk of so many *days* after new or full moon; for the full moon may happen at any hour on the day in which it falls; and thus two full moons on two Mondays may differ by almost 24 hours in their interval to the moon of Tuesday. This, however, is easily mended. Instead of talking of the moon's age, we can speak of the hour and minute when she *passes the meridian*; this is given in most Almanacks. On the day of full moon she passes, it may be, near 12 at night; the next day she will pass near 50 minutes later; and so on. The hour and minute when she passes (*solar* time, observe *not* clock time*) are an exact indication of her age; and must be used instead of the moon's age, in all calculations about tides.

5. Also we must have, not only two or three spring tides observed, but several, in order to attain an exact result; for any spring in particular, may be affected by casual irregularities, (arising from wind and the like) which may show the greatest tide on the wrong day, and this may be one, or two, three days from the regular day of the greatest tide, so that the observation would be worthless.

But taking *many* such springs, a whole year for instance, these casualties would not always occur, and would occur so as to correct themselves. If one irregular tide was too high, another would be too low; if one made the maximum too late, another would make it too early. We should have a compensation by properly taking the general effect of all spring tides.

6. Suppose, then, we have observations of the *height* of high water for several days at and near the spring tide: suppose these observations have been long carried on and accumulated in considerable number. The question will then occur, how are we to take properly the general effect or *mean result?* I will mention two ways, the first simpler, but giving only a rough average; the second more complex, but more exact.

. First method of finding how long after full or new moon the highest tide happens.

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* If the Almanack gives the moon's zenith in mean or clock time, we apply the *equation of time*.

Let the observed height of the tides about new or full, be arranged in these parcels:

Those which happen on the half-day of new or full moon.
Those which happen on the next half-day after new or full.
Those which happen on the second half-day after new or full.
Those which happen on the third half-day after new or full.

Let the height in each parcel be added together, and you will see which sum is greatest. This will show on which half-day the greatest tide happens.

7. But this only gives the result to half a day. We want it more nearly.

Secure method of finding how long after new or full moon the greatest tide happens.

The tides must be referred to the hour and minute of the preceding transit of the moon: and the moon's transit must be obtained both for the east and west sides of the meridian of London, by *interpolating* between the transits in the Almanack.

For each spring tide, the time of the moon's preceding transit, and the heights at each tide, must be laid down by lines proportional to them, the times being measured along one edge of the paper, and the heights perpendicular to these, from the point at the edge. This may be done easily and rapidly by means of paper ruled into small squares.

The points at the ends of the perpendiculars being marked with dots, it will generally be found that the line joining these dots will be an irregular or broken line. But we must "draw, by the mere judgment of the eye, and with a free but careful hand, not *through* but *among* them, a curve presenting as few and as slight departures from them as possible,"* consistently with the character of large shallow convexity from the edge of the paper.

In this curve the *greatest* perpendicular is to be drawn: and the point of the edge of the paper which we thus find will give the time of the moon's transit, corresponding to the greatest tide as given by the spring tide thus taken.

The time of the moon's transit, corresponding to the greatest tide, is to be taken in the same way for other spring tides.

The *mean* of all the times of transit thus found is to be taken.

The time of the moon's transit, corresponding to the time of highest high water at London is about 1h. 40m.; at the Cape it will, perhaps, be about 1 hour.

8. It may perhaps be found, in laying down the heights of high water by means of perpendiculars, or *ordinates*, as directed above, that there is a zigzag form given to the curve, because

* Sir J. Herschell's Paper on the Orbits of double Stars.

there is a regular difference of morning and evening tide. I have found this to occur all along the south coast of England. It would be very interesting to examine this matter at the Cape in the same way. The neap tides may be examined in the same way as the spring tides, and it may thus be found how long after the first or third quarter of the moon the lowest tide is; or with what hour (greater than 6th) of her transit the lowest tide happens.

9. I now proceed to point out another method of determining the *age of the tide* at the Cape.

The time of high water must be observed (every tide) carefully for a long period, and the *interval* at which it follows the moon's transit must be written down opposite to the time of the moon's transit for each tide.

A complete number of semilunations being taken, the *mean* of all the *intervals* must be found. This is the mean interval or *corrected establishment* of the Cape.

It then requires to be determined how old the moon is, or rather what the time of moon's transit is, when the *actual interval* of the tide after moon's transit is equal to the corrected establishment. If the tide were produced by the moon and sun *instantly*, the actual interval at new and full moon would be equal to the mean interval. But as the tide takes time in being produced and propagated, the age of the moon when this equality occurs is the age of the tide.

When many observations of the time of high water about the springs have been collected, we may find the mean of them as directed for the heights: that is, by laying down the time of moon's transit along the edge of the paper, setting off the interval of tide after transit as an ordinate, drawing a free curve through the points, taking the point of the curve when the ordinate is equal to that which represents the connected establishment, and noting the time of moon's transit, which corresponds to this, as given on the edge of the paper. This gives the time of moon's transit for one spring, and taking this time for many springs, and taking the mean, we have the time of moon's transit corresponding to the age of the tide; which ought to agree with that found before, from the heights of spring tides.

10. There may be some difficulty in observing the times of high water at the Cape, arising from the smallness of the tide and the Atlantic swell; but these are difficulties which may be got over; and without a good series of times, no great progress can be made in general views.

I will mention one or two suggestions which may perhaps be of use in diminishing these difficulties.

11. The effect of the swell, except its impulses be at very

long intervals, may be destroyed by setting up a spout with a float in it, the spout communicating with the sea by small holes only.

12. If it be found easy to observe the greatest height, and difficult to observe the time constantly, try the following method.

Observe the height carefully at some time within an hour and a half of the high water, (before or after) and compare this height with the greatest height, and also with the rise and fall of the water between high and low water.

Allow for the interval of time between the observed height and high water.

This may be done by observing two or three tides every five or ten minutes, (for a few hours near high water,) and thus making a table of the depth of the water from high water, for every five or ten minutes.

Till such a table is made, the following may be an approximate one:—

$\frac{1}{200}$	the time to high water is			32	minutes.
$\frac{2}{200}$	-	-	-	46	do.
$\frac{3}{200}$	-	-	-	56	do.
$\frac{4}{200}$	-	-	-	65	do.
$\frac{5}{200}$	-	-	-	73	do.
$\frac{6}{200}$	-	-	-	80	do.
$\frac{7}{200}$	-	-	-	86	do.

If the defect of height be of the whole rise of the water.

In this method of observing, the times at which the height is taken, ought to be either all before or all after the time of high water. Also the top of the wave ought to be observed, in order to compare with the greatest registered height, (which will, I suppose, be the top of the highest wave.)

13. By the methods above described, we might make out the age of the tide at the Cape of Good Hope: that is, by finding how old the moon is when the tide is highest; and also by finding how old the moon is when the interval of the tide and moon's transit is equal to the mean of such intervals.

But supposing we were to find in this way, that at the Cape the tide is a day, or a day and a half old, the question occurs still—where does it come from? What is it doing during this day and a half?

To this the answer is, that the tide is not produced at a single point and at a single moment, and then transferred to other points; but that it is produced by the action of the sun and moon on all parts of the ocean, and that it takes time for this action to perceive its full effect, which makes the tidal state of the ocean correspond, not to the actual position of the

luminaries, but to the position at some time before. The time which the ocean thus takes in accommodating itself to the action of the tidal forces, appears in the form of what I have called—*the age of the tide.*

But still a part of this age is owing to a real transfer of the tidal wave. In some cases, the whole difference of the age of the tide at different places, is owing to this transfer; thus on the shores of England, the age of the tide goes on increasing from the Scilly Isles to London. This increase is not owing to the action of the moon on the water in the channel, but to the time employed by the motion of a tide wave produced by the moon in the Atlantic or Antarctic ocean.

The Cape of Good Hope and Southern ocean generally, are likely to have the least portion of the apparent age of tide, owing to the time employed in transfer; and, therefore, the age of the tide there will be the *original lagging* of the tide after the corresponding positions of the moon and sun. On this account, the age of the tide at the Cape of Good Hope is an interesting subject of inquiry.

14. The age of the tide at any place, is the *sum* of the *original lagging* and of the *time of travelling*. But there appears to be indisputable evidence (in my tide observations shortly to be published, and in others already published) that the time of travelling of the tide is different at different periods of the moon's age. Hence, in order to know the time of travelling of the tide from the Cape of Good Hope to any other place, we ought to know it for the complete semilunation; which will make it necessary to observe the time of high water at *all* the tides, and not merely at springs.

For these reasons, observations of the tides, and especially of the times of high water, carefully and constantly made, will be of great value and interest; even if they are made only at one station. But if corresponding observations can be made at several stations, distant from each other by a considerable length of coast or sea, the utility and importance of the observations will be greatly increased.

W. W.

Trinity College, Cambridge, January 1, 1835.

ANNUAL REPORT

OF THE SOUTH AFRICAN LITERARY AND SCIENTIFIC INSTITUTION.

Read 11th July 1835.

In detailing to its Members how far, during the past year, the South African Literary and Scientific Institution has been able to fulfil its purposes, the Council begs leave to submit to this Meeting the following statements:

1. As to the condition and resources of the Institution: the number of Members at present composing it, amounts to sixty-nine in the colony, and five absent.

The Subscribers not Members amount to eight.

The Income received amounts to £175 : 0 : 7½, and the Expenditure to £141 : 14 : 6, leaving a cash balance of £33 : 6 : 1½, and an outstanding claim for sums due to the Institution of £36 : 0 : 0.

The Council has endeavoured conformably to the recommendation of last year, to avoid all outlay beyond what was indispensable for the creditable support of the Institution; and therefore no additions have been made by purchase to the articles in the Museum. Many valuable donations have, however, been received, as will be noticed in the Appendix; and an arrangement has been made with Mr. VERREAUX, by which he is entitled to receive the proceeds of exhibiting the Museum, and remunerates the Institution liberally for this privilege, by a continuous addition to its specimens amounting in value to Rds. 300 per annum.

Mr. VERREAUX has, in conformity with this agreement, and the arrangement noticed in the report of last year, been chiefly employed on behalf of the Institution, in preparing those skins of birds which already belonged to it. Of these, there have been distributed in the cases to the amount of 103 individuals, consisting generally of important and splendid species. The augmentation made in the whole during the year, to the Museum, in regard to the animals exhibited in it, may be estimated at £150, and Mr. VERREAUX is still under obligation to make considerable additions to this result.

In consequence of the Secretary, Rev. Dr. ADAMSON, being employed in giving gratuituos lectures on Science in the South African College, the Council has granted to him the privilege of using such articles belonging to the Institution as he may require for that purpose.

There have been published, during the last year, two parts of the Journal, edited at the Institution, of which one more is required to complete a volume. The difficulties formerly noticed, in regard to the means of publication, have not been removed.

II. As to Correspondence: the Institution continues its Correspondence with the Natural History Society of the Mauritius, and with the Zoological Society of London, and has ordered that copies of the outlines of the Zoology of South Africa, as far as it has been completed by Dr. SMITH, should be transmitted to these Associations. From the former of these Associations the Institution has received copies of the 4th and 5th Reports presented at its Annual Meetings, on the 24th August 1833, and 4th November 1834. These reports particularize the continued progress and success of that Society in the various branches of Natural Science which it has undertaken to investigate. The following are among the notices which these reports afford.

The results of Meteorological Observations during 1832 and 1833: the maximum of the hair Hygrometer was 100° on the 4th March in the former year, and 101° .5 in the latter, on the 4th November; the minima were in 1832—74° .6 on the 9th July, and in 1833—77° .7 on the 22d December. The greatest heat in 1832, occurred on the 21st January, at noon. The centigrade Thermometer marking 32° .2. The maximum of 1833 was, on the 25th January, at 1 o'clock, the same Thermometer marking 32° .8. The minimum was 15° in 1832, on the 23d August, and in 1833—14° .8 on the 3d August. The greatest and smallest atmospheric pressure respectively, in French inches, were, in 1832, 28 in. 6 lin. on the 1st August, in the evening, and 27 in. 8 . 3 lin. on the 4th March, in the morning. In 1833—28 in. 5 lin. on the 17th September, in the morning, and 27 in. on the 22d February. In 1832, there fell 47 inches of rain, and in 1833, there fell 41 inches.

In regard to Botany, the report notices that Mr. L. BOUTON had been successful in identifying many interesting plants of the Mauritius with those of distant countries, and that Mr. BOJER, in describing some new plants, had been under the necessity of instituting a new genus, to receive an individual of the family Cassieae of Decandolle, bearing a close analogy to the Poinciana Regia of Bojer. The genus he names Colvillea, after the Patron of the Society. Mr. NEWMAM had succeeded in introducing a new species of Anona, or Custard Apple, from Peru, the A-Cherimolia, which he had propagated by grafting on the *A-Reticulata*; finding that *budding* was the most successful. He had also introduced some new species of Pine Apples. The last report affords a hope that Messrs. BOJER and BOUTON are about to employ themselves in forming a detailed catalogue of the plants of the Mauritius.

The fourth report mentions, that an interesting Zoological fact had been ascertained by Mr. JULIEN DES JARDINS, viz. that the hybernation of animals is not confined to the colder latitudes. Mr. DES JARDINS discovered its existence in the Tanrec or (Erinaceus Setosus) occurring when the temperature falls to 26° to 20° cent.

Descriptions of many species of fishes were presented to the Society during those years, by M M. LIENARD, Sen. and Jun. and Mr. JULIEN DES JARDINS: and Mr. LIENARD, had presented a catalogue of an interesting collection from the west coast of Madagascar. Mr. GONDOT had communicated from that Island, a memoir on a hemipterous insect of the new subgenus Aphrophora. During the hottest period of the day, this insect exudes so great a quantity of froth and water, that Mr. GUNDOT was able, in a few hours, to fill several bottles, by catching the moisture as it dropped from the branches and leaves of one of the Mulberry trees which these insects frequent. It is further noticed as the result of researches by the same correspondent, that the northern parts of that island are very healthy, and that the risk of being there attacked by the fevers of the more southern districts, is comparatively slight.

The Statistical Society of London has communicated with the Institution, in regard to its purposes, and the Council would earnestly press on the attention of its Members the exceeding advantage which may arise from our being in possession of extended and accurate data, in regard to the condition and progress of civil society, and it would remind them that the collection of these data may be a matter of every-day occurrence, and that many individuals possess permanently or occasionally the most valuable opportunities for making the requisite observations, which derive their value chiefly from their number and the continuance and regularity with which they are made, in any district. The Council has had the gratification of receiving notice from the Attorney-General of the Colony, that his attention has been directed to this subject, and that in consequence of inquiries made by direction of the Colonial Government, he is now in possession of a great amount of valuable details, which are in course of being arranged and condensed, for the purpose of being made public. Our researches here are not confined to the domain of civilized life. The contrast of condition and character, produced by the extremes of the variations of human society, are constantly brought before us; and we must remember, that these present a transitory picture to our consideration; and that no great number of generations may pass before the peculiarities of savage life, with its characteristic purposes, conduct, and affections, will be only matter of record.

At no period of the world, perhaps, is the nature of man

likely to be presented in so many varied and interesting aspects as in the present age, when the discoveries of all past generations are at once applied to the elevation of men from barbarian life, and the effects of them all are to be experienced and disclosed in a single lifetime.

Missionaries are now establishing the discoveriesof Europe far in the interior of our continent. The methods of raising water by European instruments are now exercising the understanding of the Griqua on the deep and precipitous channel of the Gariep, and Meteorology is finding a place among their inquiries. Stations occupied by zealous and enterprising men are everywhere rising, from whence there not only flows onward the moral and intellectual influence of Christianity, but there also the Missionary is himself prepared to collect and present those numerical results, which alone afford confident data to that Philosophy which analyses and determines the laws of our temporal prosperity.

Science also may gain in many of its departments, not only from their own observations, but also because the Missionaries are every where from the respected and commanding attitude they sustain, prepared to give efficient and sustaining assistance to all who prosecute useful inquiries. It surely deserves commendation and not censure, that they display as much as their contracted endeavours will admit, the advantages of civilised life, and give an examplary proof of the comfort and well-being which science and art can confer.

It is known that means have been afforded to a certain extent of determining the structure and affinities of the languages of South Africa, by the preparation of vocabularies and by translations of portions of the Scriptures into their tongues. One effort of this kind is now proceeding in the colony, by the preparation of the New Testament in the Amakosina dialect. In respect to these endeavours, it should be kept in view, that some advantage will be derived from the adoption of some uniform and known system of representing sounds in applying the written characters of Europe to unwritten languages. The Malay tongue, for instance, if transferred from the Arabic character into the Roman at Batavia, will bear a very different aspect to that which it would acquire by the same process in London, and difficulties may be unnecessarily accumulated in tracing the affinities of languages, which a little attention might prevent.

Anything which tends to elucidate the character of the prevailing tongues in this extremity of our continent, will be of great value in the interesting questions respecting the origin and migrations of different races. The positions to be thereby analised are of this kind : have all their tongues sprung from

a common source? Will the Malagass be found the connecting link between them and the Malay, and the cognate and widespread dialects of Polynesia and America? The establishment of a connection between them and the Malagash, in those points which are common to it and to the Malay, would afford a decisive instance in settling the controversy whether these tongues have an original affinity, or have only attained a modern resemblance by the common introduction of Arabic.

III. As to Geography: the Council has learnt with great satisfaction, that the expedition into the interior has hitherto prospered. Gratifying notices of it have appeared in several European journals. The subscribers may be congratulated on the general impression, that the preparation and arrangements were suitable to the objects in view, and the circumstances in which their objects were to be attained. Similar efforts are becoming common. The results of such investigations in other continents are everywhere appearing. The acquisitions made by JACQUEMONT's Travels in the Peninsula of India, will probably soon be described, and a detailed report on the Zoological researches of M. D'ORBIGNY, in South America, has already appeared. If our Expedition succeed, therefore, it will fill up at its proper time, a vast chasm in the physical history of the world. We have every reason to conclude, that the collections already made are of great value, and that the information gained respecting the native tribes, is of great political and commercial importance. It is gratifying to add, that the apprehensions of difficulty or danger from the jealously or hostility of the natives have hitherto been found groundless, particularly that the chief of the Northern Zoolahs, through whose territories the most advantageous route for the Expedition passes, seems to be friendly to its objects. Some interesting notices of the Lake *Mampoor*, obtained from a native, have appeared in No. 4, Part II, of the Quarterly Journal.

Respecting MARTIN, to whose fate the attention of the Expedition was turned by its instructions, it has been ascertained that he did not perish in the Gariep, but proceeded among the tribes enclosed by the fork of its two chief branches, and has been traced on to the country of the Eastern Zoolahs, where it is reported he was put to death.

During the past year, several works have arrived, which required a short notice. One of them repeats an idle story current in Europe in 1810, that Robben Island had been swallowed up by the Earthquake of the preceding year. The whole details of this phenomenon are found in No. 1, of the Quarterly Journal.

There are two misstatements in the Journal of the voyage of the *Chanticleer*, published under the direction of the Admiralty,

which, from the authority thus communicated to them, the Council think it advisable to correct. The first occurs in the description of the Summer South-Easter at Cape Town, to which there is ascribed a degree of regularity, as to its rise, continuance, and character, which, though occurring occasionally, is by no means constant.

The second is, in stating the quantity of Wine introduced into Cape Town for consumption and exportation, at ninety thousand pipes, if this be not a misprint for 19 thousand, it is excessively beyond the truth.

IV. General Physics, Hydrography, and Hydraulics. The attention of the Institution was early in the last year directed to the subject of deposits, in pipes and conduits conveying water, and the President favored the Institution with a detail, respecting observations made on that subject, at Grenoble, in A. D. 1810, offering results which bear great analogy to those effects on the water pipes in Cape Town, which have excited so much attention. Specimens of incrustations almost filling half the bore of the pipes, were exhibited by Mr. CHISHOLM, the Superintendent of the Water Works, who also stated his experience in respect to these deposits. From his details he concluded:

1. That in regard to the fountain water distributed over Cape Town, it exerts no action, or only to a very small amount, in those cases where the stream does not fill the pipe, so that a considerable body of air travels with it.

2. That in close or full pipes the quantity of action or deposit, depends on the quantity of the water which traverses the pipe, the obstructions accumulating most where the stream runs quickest.

It may be remarked in addition to these circumstances, that the water leaves comparitively little sediment in the boilers of the steam engines now at work here.

The attention of the Members was at one Meeting directed to the subject of artesian wells. It is well known, that by boring through the strata of the earth, where the materials are disposed horizontally, or slightly inclined to the horizon, water has been found to spring above the surface. The softer and looser beds, which are often inclosed between others that are more compact, seeming in this case to serve the purpose of reservoirs and conduits, to transmit the fluid from loftier regions.

In this colony, the prevailing want of water may be supplied by this means where similar circumstances occur; but in respect to the country in this neighbourhood, such instances cannot be numerous. The leading formation being clay slate highly inclined, on which there are raised, masses of very compact quartz sandstone, forming caps or coverings, of which the

horizontal edges are exposed on all sides, the general arrangements are therefore, incompatible with existence of artesian wells, properly so called. But where great masses of diluvial matters are heaped upon the flanks of mountains as on the eastern slope of The Table Mountain, borings through these materials will generally produce water. It has been found in that country at depths varying from 20 to 100 feet; in the latter case the fundamental slate rock appears to have been reached, and the water is represented as fine and copious. Round the base of the mountain there issue forth five or six very plentiful springs, of which the greatest at Newlands emits, at present, when all issues are contracted by the effect of the past summer, a supply of 850,000 gallons per day. It is now proposed to convey part of this spring to town. The distance is 27,000 feet.

Tide Guages, for ascertaining the periods and rate of progress of the tides, have been erected, under the superintendence of the Astronomer Royal, at Simon's Bay and the Cape Town Jetty; and some notices of the observations have been communicated to the Sub-Committee for Meteorology, and will find a place in their Report.

The President communicated a paper on this subject, by Professor Whewell, in which the advantages to be derived from such observations, at this place, are clearly indicated.

The object in general is, to trace the connexion between the vast tide waves of the two oceans which our peninsula separates, so as to elucidate how that of the Atlantic is modified or reinforced by the undulation transmitted round the Cape of Good Hope, from the eastward.

Perhaps the machines, whose office it is to afford the requisite information, may be made to register the changes they indicate, according to methods which have been adopted elsewhere, and which have been illustrated in the proceedings of the Institution, as applicable to the thermometer and barometer. A similar method will be found described in a paper in the New Edinburgh Philosophical Journal, No. 36, by Mr. Aitheston, in which the indications are received on a revolving face or dial. It may however be more convenient to receive these indications on sheets resting on the convexity of a revolving cylinder, as these will afford more convenient comparisons, and may be so combined as to form a minute, regular, and continued map of all the occurring incidents as to meteorology. The Council has this day been enabled to present a second Report from the Meteorological Committee, to which it refers for information of the Proceedings of the Institution, in regard to this branch of its inquiries.

The Council has still to recommend that means be taken to

procure, if possible, extracts of the log-books of all ships which round the Cape of Good Hope, indicating the character of the winds and weather which they experience. The Sub-committee has been favored with some valuable communications of this nature. But generally speaking, masters of vessels have declined taking the trouble of making the requisite extracts. From the results of such investigations, in regard to the Northern Atlantic, the knowledge acquired from these observations may be of very great practical use. As tempests of great severity are generally local, occupying a comparatively small district at any given time, but appear to change their locality, at rates and in directions which experience and observation may determine, it is clear, therefore, that the sailor may learn to avoid encountering them, or may be able so to shape his course as in a great degree to avoid their violence, and he should therefore be expected to lend his aid to elucidate the laws which influence their origin and character. We may perhaps anticipate the time, when along the peopled coast of the world, intelligence of the great and dangerous commotions of the atmosphere may precede their arrival, or the tempest may be telegraphed, and its violence prepared for. During the destructive gales which sometimes occur here in November or December, indications of so unusual an event, as a winter tempest piercing through the South-easter, must have been observed at points of the coast North or South of this before they arrive to wreck the shipping in our bay. The Council would recommend that the particulars of all such gales as have been recorded should be collected and compared.

As to Miscellaneous Objects—Dr. Murray communicated a paper on Vaccination, in which, are detailed observations, tending to show, that the system of children in early infancy is generally less susceptible of the vaccine influence than afterwards.

Dr. Adamson read a paper on the Logic of Elementary Geometry, detailing the steps necessary for rendering treatises on that science strictly natural and logical in their arrangement.

Mr. von Ludwig has communicated the following notice, by Mr. Bowie, of the state of the Ludwigsburgh Garden: In the month of September 1834, the genera of plants growing there amounted to 497, containing 1353 species, exclusive of the varieties and sub-varieties of fruit and other trees.

Since the abovementioned period, 214 additional species have been raised from seeds, 124 trees, shrubs, &c. have been introduced from England, Brazil, Australia, and Mauritius, and 10 species of trees, shrubs, and herbaceous plants, from Hamburg. On the whole there are now in the Garden 1698 species.

Among the many interesting plants thus introduced, are the

clove, cinnamon, nutmeg, cocoa, black tea, oil-bearing camelia; the mandioc or casava, the long-leaved pine tree, from India, the auracarea excelsa or Norfolk Island pine, which latter are in numbers sufficient to admit a generous distribution in favorable localities. The sago palm also is flourishing.

331 packets of seeds have within the last three months been received from England, and 300 from Australia, which are now in process of culture.

A small pine apple pit has been erected, and contains 7 or 8 varieties, and a small aquarium has been prepared.

Some interesting plants, from Port Natal and other parts of the neighbouring countries, are not yet named, but are included in the aggregate above given, which is, if incorrect, rather under than above the amount. A correct catalogue is forming, in which it is intended to insert also every variety and sub-variety of the fruits and culinary vegetables, which perhaps amount to 250 or 300.

The Council has to notice the presentation of the following subjects for the Museum:

A Diploma of benediction in regard to two ladies who took the veil in 1669.—Presented by Mr. Ludwig.

A Calculus from the stomach of a goat.—Presented by Mr. Höhne.

The Skin of an Eagle.—Presented by Mr. Groenewaldt.

Various Silver Coins.—Presented by Lieut. Atkinson.

The History of Marine Architecture, in 3 vols. 4to.—Presented by Mr. Hodgskins.

Two ancient oriental Coins supposed to be Bactrian.—Presented by Col. Thomson.

A work on the Anatomy of the Pelvis, with plates.—Presented by the author, Dr. Vrolik.

Specimens of the scarlet and sacred Ibis.—Presented by Major Cloete.

Two specimens of Lizards, from New South Wales.—Presented by Mr. Chase.

Two Polish and one Indian Coins.—Presented by Mr. Remasavdt.

A Map of Africa, of old date.—Presented by Dr. Adamson.

A Memoir on the Cycadeae, by Professor Lehman.—From the author.

Various Coins and Tokens.—By Mr. von Ludwig.

Specimens of Minerals from Madagascar.—Presented by Mr. Tredgold and Mr. Kenham.

A specimen of the common Starling, killed here.—Presented by Mr. Hoffmeyer.

Specimens of 14 genera of Birds, not in the Museum.—Presented by Mr. Verreaux.

Second Report *of the* Meteorological Committee *of the* South African Literary and Scientific Institution. Read 11th July 1835.

The Meteorological Committee having proceeded to draw up and circulate a compendious body of instructions for making and registering Meteorological Observations,—the same which forms a part of their first Report to this Institution,—and having, moreover, distributed in various quarters, copies of the printed forms alluded to in p. 16 of that Report,—have received in consequence communications from various parts of this colony, in most instances expressing great willingness to co-operate in the observations recommended, but in almost every case complaining of the want of Meteorological Instruments, and in some, requesting a supply. Your Committee are not without hopes of being enabled in some instances to supply the deficiency. Meanwhile they have to acknowledge the receipt of a regular return, according to their printed form, from Capt. Wolfe, Commandant of Robben Island, of the state of the Barometer, interior and exterior Thermometer, Wind, and Weather, at the hours agreed upon, during the whole of January, February, March, and April, of the present year, with the promise of their future regular continuance. In this communication the observations appear to have been made with such regularity, and the instructions of the Committee, generally so well attended to, as leads them to regret that the Barometer employed should (as appears by the numbers set down) be one capable of being read only to the nearest tenth of an inch, and to render them very desirous to supply a better. A spare Barometer belonging to the Royal Observatory has been accordingly placed at their disposal by the Astronomer Royal, and so soon as it shall be furnished with a new tube and otherwise repaired, will be forwarded to Capt. Wolfe, with a request that his series of observations may be continued with this instrument instead of that at present used; Robben Island being in many respects a highly advantageous station for acquiring an insight into the Meteorology of this point of the coast, much more so than Cape Town itself.

From Worcester your Committee have received a register of the Thermometer only (having no Barometer), from P. J. Truter, Esq. Civil Commissioner for the district, for the month of January of the present year. Having only one Thermometer, which is used both for ascertaining the interior temperature and that of the outer air, the Committee would recommend that he should be supplied with at least one other,

and be requested, until a Barometer can be procured, to fill up the column of the in-door Thermometer, with observations of the Hygrometric state of the air, as ascertained by the depression of temperature produced by wrapping the bulb in wet linen or cotton, and suspending it freely in the manner recommended in p. 12 of their Instructions.

The Committee have also received from the Astronomer Royal, and from Sir J. Herschel, hourly Observations at the Solstices of December 1834, and June 1835, and the Equinox of March 1835, made according to the plan proposed in their printed Instructions. The comparison of these observations has shown that in this locality at least, even at stations so near together as Feldhausen and the Royal Observatory, the fluctuations of atmospheric pressure are very far from nicely corresponding, and that, so long as any wind subsists in a mountainous district, the atmospheric strata can by no means be regarded as horizontal. The calm, however, having been complete and uninterrupted for 10 successive hours on the night of the 22d ult., afforded an excellent opportunity for determining the difference of level of the two stations, which appears to be 129 feet 8 inches, subject to a trifling correction for the zero points of the Barometer, which remains to be more exactly ascertained.

Communications have been received by the Committee *from* Sir E. Ryan, Chief Justice of Calcutta, containing a Register of the Barometer and Thermometer kept by himself during his passage from Table Bay to Calcutta, in the months of December, January, and February 1834-5; *from* — McHardy, Esq. Surgeon on board the *Mount Stewart Elphinstone*, containing a similar register made in the voyage of that ship from Table Bay to London, during parts of the months of September and October 1834; *from* Capt. Wauchope, of H. M. S. *Thalia*, containing extracts from a Journal of the Barometer and Thermometer, &c. observed on board of H.M.S. *Eurydice*, off Saldanha Bay, during a heavy gale in 1819, as also in Table Bay during a violent North-wester in 1817; and lastly, *from* H. W. Innes, Esq. Surgeon on board the *Sherburne*, containing a similar register kept during the approach to and after the arrival of that ship in Table Bay in January 1835.

Of the two former of these communications (those of Sir E. Ryan and of Mr. McHardy), it must be observed that they both, but especially the first, afford strong corroborative, and indeed, quite decisive evidence of that important meteorological fact of a considerable depression of the Barometer in approaching to the equator from extratropical latitudes. Sir E Ryan's Barometer, previous to his sailing was compared, through the medium of a portable Barometer in possession of Sir J.

Herschel, with the Mural Circle Barometer of the Cape Observatory, the difference of which from the Standard of the Royal Society had been previously ascertained by two distinct comparisons agreeing perfectly *inter se* made by the intervention of the above-mentioned portable Barometer, which had been brought to the Cape by Mr. Henderson, and again transported by him to London. By these comparisons it was found that Sir E. Ryan's Barometer required a correction of —0 . 116 in. to reduce it to the Royal Society's Standard. This correction being applied, and the reading so corrected being reduced to the freezing temperature, and classed into groupes in zones of 10° in breadth, proceeding Northwards and Southwards from the Equatorial Zone (between the Latitudes 5° N. and 5° S.) according to the observed latitudes of the ship at noon of each day, give as follows :—

Limits of the Zone of Latitude.	*Number of Days' Observations.*	*Mean pressure observed in inches*	*Mean corresponding observed Latitude.*
Equatorial Zone			
Lat. 5° N. to 5° S.	7	29 . 821	0° 41′
Lat. 5 to 15	10	29 . 849	9 50
Lat. 15 to 25	8	30 . 030	19 12
Lat. 25 to 35	10	30 . 125	31 0
Lat. 35 to 40	24	29 . 934	38 25

The observations of Mr. MacHardy, though extending only to Latitudes South of the Equator, and though evidently made with far less care and with an instrument in which the fluctuations arising from the motion of the ship are very imperfectly destroyed, yet, when reduced and grouped in a similar manner, afford a result agreeing in their general tenor very satisfactorily with those of Sir E. Ryan. To render them comparable, as the zero of Mr. MacHardy's Barometer is unknown, a correction of —0 . 188 has been applied to all his reduced observations, by which the Equatorial indications of the two Barometers are made to agree, and the following Table exhibits their results when so reduced, grouped, and corrected:

Limits of the Zone of Latitude.	*Number of Days of Observations.*	*Mean pressure in inches.*	*Mean corresponding Latitude.*
Lat. 0° N. to 5° S.	8	29 . 821	1° 42′
Lat. 5 to 15	5	29 . 802	9 20
Lat. 15 to 25	6	29 . 960	19 41
Lat. 25 to 35	16	30 . 085	31 20

The total depression concluded from the latter series of observations agrees very nearly in amount with that stated by Sir J. Herschel, as the result of his own observations during his voyage from England. The general fact may now therefore

be looked upon as unequivocally established, and it is hoped that it will henceforth attract the attention of all voyagers, and that observations will be diligently accumulated for the purpose of ascertaining the law of variation of atmospheric pressure in all latitudes both within and beyond the tropics, and in either hemisphere, since it is very possible that the same exact law may not be found to apply to both, and that the Atlantic, Indian, and Pacific Oceans may offer differences depending on their different extent and relation to the continents adjacent to them.

If in a report like this, it be allowed to speculate on the causes of meteorological phenomena, it appears extremely probable that the equatorial depression in question arises from the same cause which produces the trade winds, viz. the rarefaction and consequent ascent of the equatorial air, which although constantly supplied from the extratropical latitudes, is yet not supplied *instanter*, nor without a due dynamical motive force, which, in a free elastic fluid *can* be no other than an excess of pressure on the side from which the supply is drawn, or (which comes to the same thing) a diminution of it, in the nature of a "suction" on that side towards which the superficial currents rush; which excess and diminution obviously arise from the overflow of the unsustained portion of atmosphere above the equatorial zone into the regions beyond. The inquiry, therefore, connecting itself as it does, with all the greater phenomena of meteorology, assumes a high degree of interest, and will no doubt be studied with the perseverance and exactness it merits.

A series of observations of the heights and times of high and low water, at Simon's Bay, extending from January 26 to June 30, has been obligingly submitted to the consideration of the Meteorological Committee, by J. Deas Thomson, Esq. and the Astronomer Royal. It has not yet been possible to compare them with any theory, and indeed it would be premature to attempt it here, as they will require to be combined with the mass of knowledge now accumulating on this subject in Europe, to render them in any degree available. One remarkable result, however, may be mentioned here, which offers itself on a very cursory inspection of the heights, as compared with the declinations of the Sun and Moon, viz. that while the monthly fluctuation of the mean Sea-level, arising from the *Moon's* alternate occupation of the northern and southern hemisphere, is scarcely perceptible, amounting hardly to 2 inches, its annual variation, due to the similar approach of the Sun to the northern and southern solstice, is much more considerable, and forms indeed a prominent feature in the Tides of this coast, amounting to no less than 8 inches, or nearly a fifth of the average difference between high and low water—as the following brief table will show—in which the interval embraced by the observations is

divided, not as usual into lunations from full to full or from new to new Moon, but into periods marked by the Moon's passing from south to north of the equinoctial. By this division the effect (if any) of the Moon's change of declination compensates itself, and leaves the solar effect in evidence. The cause of the prominence thus given to this part of the Sun's agency, appears to lie in the length of its period compared with the Moon's, which gives time for the waters of the whole ocean to accommodate their general level to the actual force, by bodily transfer from one part of the globe to another, and by assuming, at each instant, (what the Tides of short period have never time to do,) very nearly the figure of equilibrium due to this particular modification of the disturbing forces.

Observed mean positions of the mid-water mark on the float of the Tide-gage at Simon's Bay, during successive intervals of the Moon's Transit from North to South of the Equinoctial.

Limits of intervals.	*No. of Tides observed*	*Heights of mid-water on the Gage.*	*Remarks.*
Jan. 26 to Feb. 16	22	4 feet 4 . 38 in.	period incomplete.
Feb. 17 to March 15	27	4 2 . 35	
March 16 to April 11	27	3 10 . 83	
April 12 to May 9	28	4 0 . 22	
May 10 to June 5	27	3 9 . 52	
June 6 to June 30	25	3 8 . 37	period incomplete.

At the Meetings of the Institution of Wednesday, September 3, and October 1, Sir J. Herschel stated that he had examined the Meteorological Journal kept at the Port Office by Mr. M'Cleod, under the direction and superintendance of Capt. Bance, during 58 months, commencing with October 15, 1828, in which are registered the heights of the Barometer with the temperature of the instrument, for the hour of 9 A.M., noon, and 3 P.M., with the usual notices of wind and weather, and that having reduced and interpolated them by graphical projection, he had been led to the following conclusions:—

1st. That the atmospheric pressure at Cape Town is subject to a considerable and very regular annual fluctuation amounting (when reduced to a temperature of 32° Fahr.) to 0 . 287 in. —the highest level being attained about the 16th of July, and the lowest about the 16th of January, on an average of 5 years.

2d. That the Barometric pressure is also subject to a regular diurnal fluctuation, whose average amount on a mean of the whole year may be stated at 0 . 027 in.; the highest pressure taking place at or about 9 A.M., and the lowest (so far as can be gathered from observations made only at the hours above-named) at 3 P.M.

3rd. That this daily oscillation is itself subject to an annual alternate increase and diminution,—the limits being 0 . 0198 in. and 0 . 0322, the former or lesser diurnal variation corresponding to the middle of January, and the latter or greater to the beginning of July.

4th. That these fluctuations are maintained with such regularity that there is not a single month in the 58 examined, in the mean of which the daily oscillation does not appear,—and that in the annual oscillation (with exception of one remarkable anomaly, produced by the tremendous storm of July 1831) not only does every year exhibit the fluctuations in question, but its progress is marked by similar stages, or phases of increase and diminution; the most remarkable of which is a temporary suspension of the regular, rapid rise of the mercury towards its maximum, usually taking place about the latter end of May or beginning of June.

5th. That, contrary to usually received notions—the rainy season at the Cape corresponds to a *generally* elevated state of the Barometer—although it is true that particular storms of wind and rain are often marked by a temporary depression.

Sir J. Herschel further observed, that the amount of the Annual Barometric variation at the Cape corresponds pretty nearly with the amount of a depression of the mercury which he stated to have been observed by himself in his voyage hither, at and near the Equator, below its habitual state in the extratropical regions,—a depression then noticed as he at that time supposed for the first time, but which it appears had also been (very recently) noticed and made the subject of inquiry and numerical computation by Professor Schow of Copenhagen, in a paper published in the Annales de Chimie for June 1833.

Sir J. H. also further stated that the mean Annual Barometric fluctuation at Calcutta, on the average, of between two and three years observations made by Mr. Prinsep, examined by him, appears to be much greater than that at the Cape, and what is very remarkable, in a contrary direction, the Maximum of Calcutta corresponding to the Minimum at the Cape. And he attributes this to an actual bodily transfer of a portion of air from hemisphere to hemisphere, by the alternate heating and cooling of the two hemispheres as the Sun crosses from side to side of the Equator. The effect of this cause which he considers to be general over the whole Earth, will be to modify the regular and constant effects of the trades by a set of periodical winds differing materially in their character from local monsoons, and to this cause he is disposed to attribute the observed annual oscillation of the extreme North and South limits of the Trade winds.

The Northern Hemisphere he further observed, being by reason of its greater quantity of land, more superficially heated than the Southern, it should be expected that the mean pressure beyond the Southern tropic should exceed that beyond the Northern, and he suggested this as a subject worthy of examination by Meteorologists properly situated in both hemispheres.

Lastly, he observed, that severe gales occurring whether in summer or winter, appear to depend on causes entirely extraneous to the regular periodical fluctuations of pressure, and are probably dependent on causes of a local and transient nature—but that *a correspondence of extraordinary seasons* in distant parts of the Globe, may be expected to accompany great occasional deviations from the usual law of these fluctuations in any given place, and that it is far from impossible that an assiduous attention to this point may ultimately enable us to predict their occurrence.

The series of observations at the Port Office being still in progress—the foregoing results are not considered as final, but whatever modifications future years' observations may necessitate, will be from time to time inquired into and reported.

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OR THE

SECOND SERIES OF THE SOUTH AFRICAN QUARTERLY JOURNAL.

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FIRST SERIES.

Local Intelligence.

Printed at the "Gazette Office," Cape Town.

MUSEUM NATURAL HISTORY