CHAPTER 20

SUMMARY AND CONCLUSIONS

The data on which the interpretations and conclusions of this study rest are derived from three sources: pertinent records from the literature, unpublished field notes of others and my own field observations.

The origin of the family Bathyergidae is obscure. This is partially explained by the absence of paleontological information. The possible taxonomic position of the Mongolian fossils Tsaganomys altaicus and Cyclomylus lohensis (accepted as bathyergids by some authors) is discussed. In addition, the known bathyergid fossils from African deposits (Heterocephalus quenstedti, Heterocephaloides darti, Bathyergoides neotertiarius, Gypsorhychus darti, G. minor, G.makapani, Cryptomys robertsi, Bathyergus cf. suillus and Georychus cf. capensis) are briefly reviewed. It appears that the genus Bathyergus shows little relationship with the fossils listed above, while there seems to be a closer relationship between the extinct genus Gypsorhychus and the extant genera Cryptomys and Georychus. Further collecting of fossil forms will no doubt uncover additional information concerning the origin and phylogenetic diversity of the Bathyergidae.

Past attempts at taxonomically grouping the genera and species of bathyergids are presented and discussed. They were either treated as an isolated group, or placed among the myomorphs and hystricomorphs

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and in one isolated instance among the sciuromorphs. For the purposes of the present work, the mole-rats are interpreted as specialized hystricomorphs.

A detailed discussion of the cranial morphology of Bathyergus is presented, supplemented by notes indicating those points of difference where Cryptomys and Georychus differ from Bathyergus. During the preparation of the present work it has become evident that there is a great degree of individual variation encountered in the different cranial elements (in extent, size and structure). This implies that cranial elements (e.g. the nasals), used as diagnostic characters, should be treated with a certain degree of reservation, especially as far as specific and subspecific levels are concerned.

Aspects relating to the so-called taxonomic 'isolation' of the bathyergids are also presented. It is tentatively concluded that this 'isolation' has been over-emphasized in the past. Data pertaining to the skull, post-cranial skeleton, myology and reproductive system all point to the hystricomorph affinity of the bathyergids.

Data concerning the biology of the bathyergids are discussed at length. It is clear that there is a broad, overall resemblance as far as biological aspects are concerned between Bathyergus, Cryptomys and Georychus. The existing differences are relative rather than absolute. It must be stressed that very little is known concerning the biology of Georychus. In fact, as far as all three genera are concerned, many biological facets await future investigation and research. The possibility of the application of modern techniques (e.g. radio-active tagging) to

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unravel biological questions concerning the mole-rats is stressed. Nothing is known about home range, daily activity rhythmn, food preferences and reproduction. It is therefore not clear what role these animals play in the ecosystem of nature.

In the present work, a new key for the identification of the various Southern African bathyergids is proposed, based on all the accumulated evidence. Unfortunately some species are poorly represented as study skins and skulls in Southern Africa, and the application of this key may lead to certain difficulties in identification in the case of Cryptomys bocagei, C. beirae and C. nimrodi.

All the bathyergid species encountered in Southern Africa are interpreted as monotypic in this work. The present arrangement recognizes 12 species i.e. Bathyergus suillus, B. janetta, Georychus capensis, Cryptomys hottentotus, C.damarensis, C.holosericeus, C.darlingi, C.nimrodi, C.beirae, C.bocagei, C.natalensis and C. komatiensis. This interpretation therefore differs greatly from that offered by Roberts (1951) who regarded Bathyergus suillus, B. janetta, Georychus capensis, Cryptomys hottentotus, C.holosericeus, C. natalensis and C. komatiensis as polytypic species. Similarly, the taxonomic position of the bathyergids as I see it at present, also differs radically from the interpretation adhered to by Ellerman et.al. (1953). These authors regard B.suillus and B.janetta as conspecific, while in the present work they are interpreted as two separate species. As far as Cryptomys is concerned, Ellerman et.al. only accept C.hottentotus and C.holosericeus to occur as species in Southern Africa, while all the

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other described species are treated as races or are placed in synonymy under either hottentotus or holosericeus. I am not inclined to accept this interpretation for it is felt that the taxonomy of the bathyergids in Southern Africa is thereby simplified to too great an extent. I fail to see why well-marked species such as C.damarensis and C.natalensis do not deserve specific recognition. To this must be added that there exists an element of doubt concerning the validity of C.holosericeus as a separate species.

As here understood, Bathyergus suillus is a monotypic species, while B.s.intermedius is treated as a synonym. Ellerman et.al. (1953) have regarded B.suillus and B.janetta as conspecific, but this possibility is rejected in the present work. With the aid of ratios it is shown that suillus and janetta are different species and that these differences are statistically valid. B.suillus is the largest bathyergid found in South Africa, limited to coastal regions between Lambert's Bay and the vicinity of Knysna. Colour geographically variable.

Similarly, Bathyergus janetta is accepted as a monotypic species in the present work. The proposed synonyms include B.j.inselbergensis and B.j.plowesi. It is found that too little material is available for proper definition of the supposed subspecies. The geographical distribution of this species is rather localized i.e. occurring mainly in the vicinity of Port Nolloth and adjacent areas. B.janetta is far smaller than B.suillus, showing little geographical variation in colour.

In contrast to Roberts (1951), Georychus capensis is also accepted as a monotypic species as has

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been done by Ellerman et.al. (1953). G.c.canescens and G.c.yatesi are treated as synonyms. This procedure has been adhered to in the present work in view of the fact that diagnostic characters listed for canescens and yatesi can also be demonstrated to be present in capensis. The pattern of distribution of this species is interesting: ranging along the coast from Cape Town to Knysna and also occurring at Nottingham Road, Natal and at Belfast in the Transvaal. Geographical variation in colour is found. Phylogenetically, the genus Georychus shows a greater degree of relationship to Cryptomys than to Bathyergus.

The small to medium-sized Cryptomys hottentotus is interpreted as a monotypic species in the present work. The synonyms include C.caecutiens, C.vandami, C.jorisseni, C.albus, C.hottentotus cradockensis and C.h.transvaalensis. The species is geographically variable as far as size and colouration is concerned. It exhibits an extensive distribution pattern in South Africa, ranging along the coast from Klaver to the Eastern Province, northwards over large stretches of the Karoo into the southern Orange Free State. It is also encountered in the north-western and north-eastern Transvaal. It therefore occurs in diverse ecological habitats.

The monotypic Damara mole-rat Cryptomys damarensis has C.lugardi, C.micklemi and C.ovamboensis as synonyms. It has a very wide geographical distribution, confined to the drier, western half of Southern Africa. This is the only species where polymorphism in colouration is encountered i.e. specimens occur in three colour phases. Furthermore, it is the largest Cryptomys species found in Southern Africa. It is

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likely that it has certain phylogenetic affinities with C. bocagei from Angola and C. darlingi from Rhodesia when phenotypic appearance and aspects of cranial morphology are considered.

The validity of Cryptomys holosericeus is open to question. A number of aspects seem to suggest the possibility of synonymizing holosericeus with hottentotus, but this step has not been taken in the present work. As here understood, C.holosericeus is a monotypic species occurring in the north-western Cape Province and north-western Orange Free State. The following described forms are treated as synonyms: C.holosericeus orangiae, C.h.vetensis, C.h.valschensis, C.h.vryburgensis and C.hottentotus bigalkei. The colouration shows geographical variation. The possibility of Graaff-Reinet (hitherto accepted as the type locality of C.holosericeus) being the type locality for this species is questioned.

The fact that C.holosericeus may eventually by synonymized with C.hottentotus is based on the following aspects:

(i) Variation in size encountered in C.hottentotus and C.holosericeus. Adult individuals of the former species may attain the large size of the latter species, while adult specimens of the latter species may fall well within the range of variation of the former species.

(ii) There is a pronounced resemblance between hottentotus and holosericeus as far as phenotypic and morphological aspects are concerned.

(iii) The limits of geographical distribution of hottentotus and holosericeus are not clear. If holosericeus is interpreted as a synonym of hottentotus,

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the break in geographical distribution which presently exists in the case of hottentotus will be eliminated.

Ellerman et.al. (1953) have placed Cryptomys darlingi as a race of C.hottentotus while Roberts (1951) has retained it as a separate species. The latter interpretation is followed in the present work. This species occurs predominantly on the Mashonaland plateau in Rhodesia and no synonyms are known. Future research could well result in the fact that C. bocagei, C.nimrodi and C.beirae will be interpreted as synonyms of C.darlingi. A certain amount of geographical variation in colour is evident in this species. Phylogenetically it seems to be related more closely to C.damarensis than to C.hottentotus.

As far as Cryptomys nimrodi is concerned no specimens available for study can convincingly be referred to this species. Therefore, all the information given in the present work has been extracted from the existing literature pertaining to this species. It is known only from the type locality viz. Essex Vale in Matabeleland, Southern Rhodesia. Geographically, it falls within the range of distribution of C.darlingi and its possible relationship to C.darlingi is suggested as far as colour and craniological aspects are concerned. The validity of C.nimrodi as a separate species is open to question.

Cryptomys bocagei from Angola also occurs in the northernmost parts of South West Africa and is therefore included and discussed in greater detail in the present work. The taxonomic position of this species is not clear. As is the case in C. beirae,

study specimens are few in number. It is felt that this is probably not a good species and its possible relationship to C.darlingi (resembling it phenotypically and morphologically rather closely) is obscure.

The validity of the species rank of Cryptomys beirae from Beira and vicinity is also open to question but it has tentatively been retained as a separate species. This species may eventually be synonymized with C.darlingi. As here understood, C.beirae is a monotypic species with C.zimbitiensis as a synonym.

Cryptomys natalensis is like-wise interpreted in the present work as a monotypic species. Its synonyms include: Cryptomys natalensis langi, C.n.aberrans, C.n.junodi, C.n.jamesoni, C.n.arenarius, C.n.mahali, C.anomalus, C.montanus and C.komatiensis zuluensis. This species has also been grossly oversplit in the past. Colour is geographically variable and it exhibits an extensive range of distribution occurring in the Transvaal, Natal and southern portion of Mocambique. It is a large species and phylogenetically it has certain affinities with C.komatiensis.

Finally Cryptomys komatiensis remains to be considered. This species is confined mainly to the eastern Transvaal. It is a small species, and the following described forms are interpreted as synonyms: C.komatiensis stellatus, C.k.melanoticus, C.rufulus and C.natalensis streeteri. The colour is geographically variable. As is the case in C.natalensis, the inguinal mammae are constantly absent in C.komatiensis possibly indicating some phylogenetic

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relationship.

It is to be emphasized that the ideas and proposals embodied in this work are not to be interpreted as the last word on the subject. The taxonomic position of the mole-rats in Southern Africa is still very fluid (especially as far as the genus Cryptomys is concerned), subject to future research and interpretation. It is felt, however, that the major overall result which has emerged from the present work is the considerable simplification of taxonomical data concerning the Bathyergidae in Southern Africa.

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