THE MOLLUSCS OF THE SALT RANGE, PUNJAB.

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(Plate IX).

A considerable collection of molluscs was made in the Salt Range by Theobald as long ago as 1851-52. Some of the species he obtained were described by Benson at different times, while all the Gastropods were recorded by Nevill in his *Hand List of Mollusca in the Indian Museum* (1878 and 1885). Dr. Sunder Lal Hora, whose introduction to the papers in this series may be consulted for particulars as to the physical conditions prevalent in the Salt Range, has brought back an interesting collection, particularly rich in aquatic forms. It should be noted that all his specimens are from that part of the range which lies east of the Indus. Unfortunately we have no particulars as to the precise localities in which Theobald collected his shells.

Considering the two collections together, we find specimens of 20 species of Gastropoda, 9 terrestrial (including a *Succinea* of unknown habits), and 11 aquatic. Of the 19 species of which anything precise is known, six have a wide distribution in the Oriental region, and seven in N. India. Four species are apparently endemic in the Salt Range, while two were known hitherto only from the Baluchistan desert, Southern Persia and Iraq[1]. We may thus say that about 32 per cent of the Gastropods are Oriental in a wide sense and another 37 per cent Indian, while at least 21 per cent are endemic, and that there is some evidence of an element belonging to the Afghan fauna. The Afghan forms are aquatic as well as one of the endemic species, three of the latter being terrestrial.

Conditions of life in the Salt Range are very unfavourable for terrestrial and still more so for aquatic molluscs. The climate is dry and extremely hot for a considerable part of the year and much of the water is saline. Such a climate is not always inimical to the existence of a rich, or at any rate an abundant fauna of land snails, but the fact that the soil is impregnated with mineral salts is a most deterrent condition. For aquatic forms these factors, especially the last, are still more unfavourable. It is not surprising, therefore, that 69 per cent. of the species are widely distributed in India or still further afield, for broad geographical range in a species in itself implies a physiological constitution readily adaptable to diverse conditions of life. That there should be a large endemic element in the Gastropod fauna might also be expected from the isolation of the Salt Range. It is interesting, however, to find that the Afghan fauna is represented. No species of this fauna has been

[1] One of these (*L. persica*) has since been found in the Western Himalayas, at Peshawar and also (exceptionally) in the Deccan.

found hitherto east of the Indus. The occurrence of *Limnaea persica* and *Melanoides flavidus* is doubtless to be accounted for by similarity of conditions to be found in the Afghan-Baluch-Persian desert on the one hand and in the Salt Range on the other. This has enabled the fauna, or at any rate certain of its representatives, to spread into a territory which belongs geographically to the Indo-Gangetic plain.

The Pelecypoda collected by Dr. Hora belong to two widely distributed Indian species and have no particular geographical interest.

LIST OF THE LAND AND FRESH-WATER MOLLUSCS OF THE PUNJAB SALT RANGE.

GASTROPODA.

Terrestrial Species.

Fam. Helicidae.

Eulota pentepotamiensis, sp. nov.	Endemic.

Fam. Testacellidae.

Ennea bicolor (Hutton).	Peregrine.

Fam. Bulimindae.

Buliminus salsicola (Benson).	Endemic.
B. *dextrosinister*, sp. nov.	Do.
Pupoides coenopictus (Hutton).	Drier parts of India.
Pupoides lardeus (Pfeiffer).	Not recorded. Possibly endemic.

Fam. Achatinidae.

Opeas gracile (Hutton).	Peregrine.
Zootecus insularis (Ehrenberg).	Do.

Fam. Succineidae.

Succinea crassinuclea (Pfeiffer).	N. India.

Aquatic Species.

Fam. Hydrobiidae.

Amnicola (*Alocinma*) *pulchella* (Stoliczka).	N. India ; Assam.

Fam. Melaniidae.

Melanoides tuberculatus (Müller).	Africa to New Guinea.
Melanoides flavidus (Nevill).	Iraq ; S. Baluchistan.

Fam. Limnaeidae.

Limnaea acuminata Lamarck.	India ; Burma.
Limnaea luteola Lamarck.	India ; Burma ; Mauritius (?introduced).
Limnaea persica Issel.	S. Persia ; S. Baluchistan ; N. India ; Deccan.

PELECYPODA.

Fam. Cyrenidae.

Corbicula striatella Deshayes.	India.

Fam. Unionidae.

Indonaia caeruleus (Lea).	India.

TERRESTRIAL SPECIES.

Eulota pentepotamiensis, sp. nov.

1878. *Nanina* (*Bensonia*) *jacquemonti* Martens (in part), Nevill, *Hand List Moll. Ind. Mus.* I, p. 49.

The shell is depressedly conoidal, almost flat below and with a very broad short spire, moderately thick, translucent white when fresh, often with a narrow brown stripe running round above the suture and the periphery of the body-whorl. The spire is flatter in some shells than in others, but is never acuminate. There are five and a half whorls, which increase gradually and evenly in size. The body-whorl is subcylindrical and without trace of a keel. The suture is linear and impressed. The mouth is lunate and almost horizontal as the last whorl descends very little, but there is some variation in this respect. The umbilicus is deeply perforate but always small. It varies considerably in size and in some shells is nearly closed. The edge of the lip is sharp and not at all reflected, and there are only slight indications, mainly on the upper part, of a thickening inside it. The columella is but slightly reflected over the umbilicus. The upper surface of the shell has an oily lustre, while the lower is highly polished. The sculpture consists of strong vertical striae, somewhat variable in development on the upper surface of the last four whorls, and of very much finer striae running in the same direction on those of the apex. On the lower surface the striae are also well developed except towards the mouth. A very minute spiral striation can be observed with a strong lens, especially on the upper surface.

Measurements of shells (in mm.).

	Type	1	2	3	4	5	6
Major diameter ...	18·2	18·8	19·1	18·5	18·1	18·4	18·0
Minor diameter ...	16·5	16·8	16·8	16·0	15·8	16·0	15·6
Height	8·2	8·4	8·0	7·6	7·2	8·0	8·4
Greatest width of aperture	8·0	8·6	8·9	8·5	8·2	8·4	8·2
Height of aperture ...	6·5	7·1	7·1	6·9	6·6	6·8	6·8

This shell was confused by Nevill with that of *Bensonia jacquemonti*, to which it bears a certain quite superficial resemblance. It may easily be distinguished, however, by its size, texture and colour, and by differences in the shape of the mouth and the size of the umbilicus, which is always much smaller. The true relationships, in spite of geographical difficulties, seem to be with forms like *Eulota planispira*. The shell is, however, distinguished by its much more flattened form and very small umbilicus from that of *Eulota planispira*.

Type-specimen.—No. M $\frac{12126}{2}$ *Zoological Survey of India* (*Ind. Mus.*).

We have examined a large series of shells, including those collected in the Salt Range by Theobald and assigned by Nevill to *Bensonia jacquemonti*. Dr. Sunder Lal Hora obtained numerous empty shells on the hillsides at Katas and two (smaller than the others) on the banks of the Katas Nallah, in July, 1922.

Ennea bicolor (Hutton).

1908. *Ennea bicolor*, Blanford & Godwin-Austen, *Faun. Brit. Ind. Moll.* I, p. 19, fig. 12.
1921. *Ennea bicolor*, Annandale & Prashad, *Rec. Ind. Mus.* XIX, p. 189.

A single specimen was obtained by Theobald in the Salt Range.

Buliminus (Petraeomastus) salsicola (Benson).

1914. *Ena* (*Subzebrinus*) *salsicola*, Gude, *Faun. Brit. Ind., Moll.* II, p. 248.

The series collected by Theobald in the Salt Range and described by Benson is still intact in the Indian Museum.[1] We have selected two shells (M $\frac{12128}{2}$) as lectotypes and figure them here. As there is some individual variation, it is impossible to regard any one shell as typical. Dr. Hora did not rediscover the species.

Buliminus (Subzebrinus) dextrosinister, sp. nov.

1878. *Buliminus* (*Petraeus*) *eremita* (?) Hutton, Nevill, *Hand List Moll. Ind. Mus.* I, p. 134.

Specimens thus recorded by Nevill and collected by Theobald in the Salt Range agree precisely with some of those of a large series recently obtained by Dr. Sunder Lal Hora in the same range, but the latter show much greater individual variability and include many sinistral shells. Dextral specimens resemble those of the true *B. eremita* from Afghanistan and adjacent districts in many particulars but are quite distinct from those of *B. salsicola* and are as worthy of specific distinction as those of such forms as *B. sindicus*. The new species can best be described in comparison with *B. eremita*.

Apart from the fact that the shell in some localities is indifferently either dextral or sinistral and that at certain spots sinistral shells are more abundant than dextral, the most noteworthy differences are the following :—

(1) In *B. dextrosinister* the base of the body-whorl is much less compressed than in *B. eremita* and consequently the umbilicus is less conspicuous and the mouth less expanded in appearance.
(2) The shell is more elongate and has a more tapering spire than that of *B. eremita*.
(3) The body-whorl tapers slightly towards the base, giving the shell a somewhat spindle-shaped form.
(4) Both lips of the mouth are vertical and almost straight, running parallel to one another in such a way that the aperture forms an ellipse truncated obliquely at the posterior inner margin.
(5) The body-whorl is less inflated than in *B. eremita* and the outer lip projects less beyond its outer outline.

In fresh shells the colour is opaque white conspicuously streaked or spotted with transparent brown.

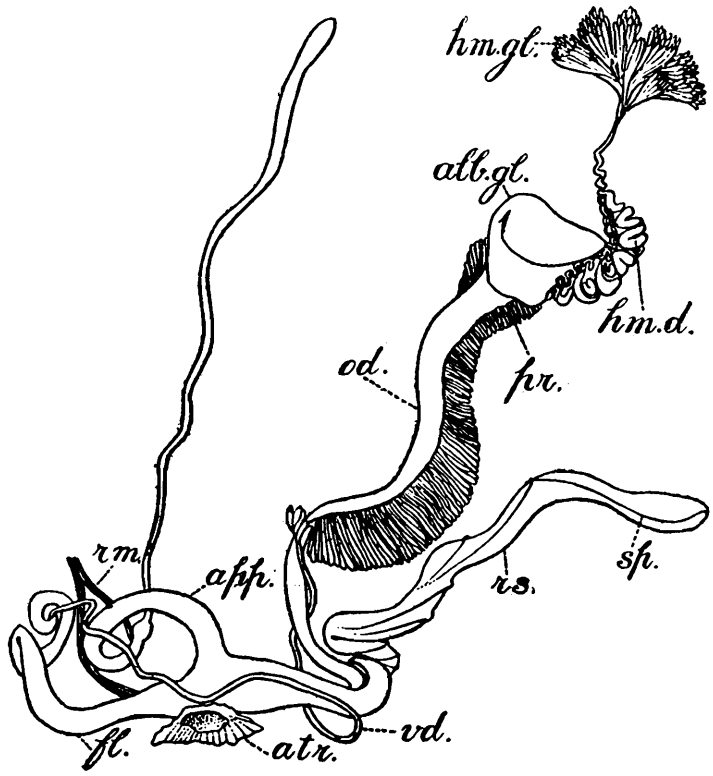
In sinistral shells the body-whorl has a somewhat distorted appearance and the outer lip projects further and is more curved than in dextral shells. Such shells are also a little larger than dextral specimens.

[1] The author of vol. II on the molluscs in the official "*Fauna of British India*," appears to be unaware of the fact that many of Benson's types are in the Indian Museum.

Shells in our large series exhibit considerable variation in outline, but the characters given above seem to be constant.

External characters of the animal.—The foot is narrow and pointed and a pair of tentacles are present in addition to the eye-stalks. The specimens that we examined were too much contracted to provide detailed information as to external features in other respects.

The genitalia agree in general structure with those of the Chinese species described by Wiegmann[1] except in one important feature, namely, the complete absence of a diverticulum on the copulatory pouch. The male and female ducts open into a common atrium situated, in a dextral shell, on the right side of the body a little behind the eye-stalks. The hermaphrodite gland, as in certain species figured by Wiegmann, Jacobi[2] and Beck,[3] is racemose or rather finely lobulate. Its duct is much convoluted, especially towards the lower extremity. The albumen gland is large and elongate, sometimes folded on itself but straight in some individuals. The oviduct is broad and simple in structure. The copulatory pouch, which arises not very far from its base, is comparatively short and blunt at its extremity. There is no trace of the diverticulum.



TEXT FIG. 1.—Genitalia of *Buliminus dextrosinister*, sp. nov. (dextral shell) *alb. gl* albumen gland ; *atr.* genital atrium ; *app.* appendage ; *hm. gl.* hermaphrodite gland ; *hm. d.* hermaphrodite duct ; *fl.* flagellum ; *od.* oviduct ; *pr.* prostate ; *rm.* retractor muscle of flagellum ; *rs.* receptaculum seminis ; *sp.* spermatophore pressed against the walls of the receptaculum seminis ; *vd.* vas deferens.

In one of the specimens examined the pouch contained two spermatophores. These were vermiform bodies sharply pointed at both ends

[1] Wiegmann, *Ann. Mus. Acad. Imp. Sci. St. Petersburg* VI, pp. 220-290, pl. x-xi (1901).

[2] Jacobi, *Journ. Coll. Sci. Tokyo* XII, pp. 76-82, pl. vi, figs. 113-115 (1898-1900).

[3] Beck, *Jena. Zeitschr.* Jena XLVIII, pp. 187-225, p. viii-x (1912).

with a hooked process on one side near the middle and bearing a closely-wound chitinous spiral keel on one half. One extremity, that without keel, was bent in a regular wide arc for almost half of the length of the whole structure, while the other was twisted in an open spiral of three whorls.

TEXT FIG. 2.—Spermotophore of *Buliminus dextrosinister*, sp. nov.

The male part of the genitalia differs less than the female from that of previously described species of *Buliminus*. The penis-sheath is elongate and almost filiform but slightly dilated at the tip. The flagellum and the vas deferens are normal. The prostate is an elongate, band-shaped gland lying in close contact with the oviduct.

Alimentary System.—The jaw resembles that of *Buliminus* (*Subzebrinus*) *beresowskii* but is not so stout or deep.

The radula has the approximate formula 14. 10. 1. 10. 14. The teeth differ from those of *Buliminus reinianus* in that the main cusp is relatively larger, especially on the marginals, but are of the same type.

The alimentary canal is long and coiled. The oesophagus has thickened walls and its lumen is raised into folds. The stomach and intestine are wide and thin-walled.

In sinistral shells the soft parts are reversed in direction and position.

Type-series :—Dextral No. M $\frac{12125}{2}$, Sinistral No. M $\frac{12124}{2}$.

Measurements of shells (in mm.).

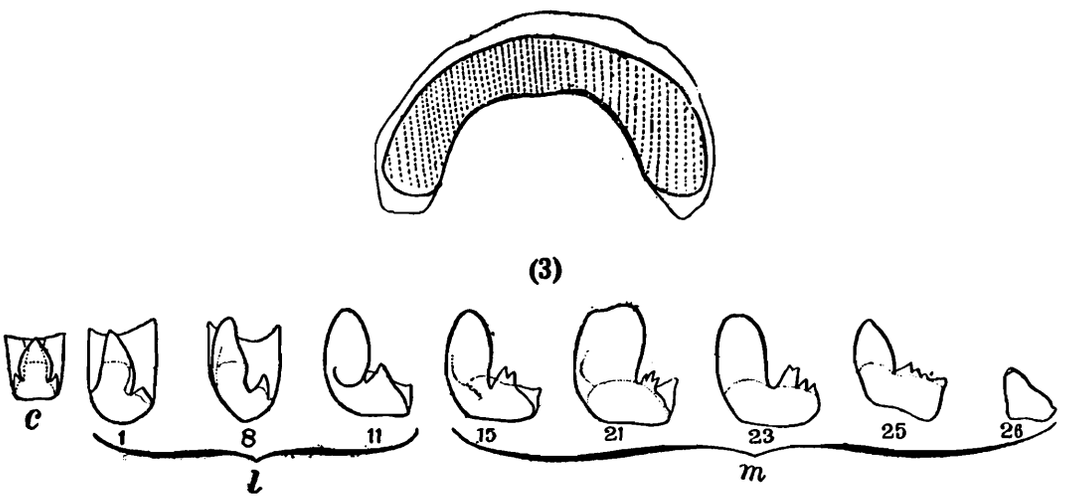
	Sinistral.			Dextral.		
	1	2	3	1	2	3
Height	21·3	21·0	20·5	18·8	17·0	17·8
Greatest breadth	6·5	7·0	7·0	6·0	6·2	6·5
Height of aperture ...	6·8	7·5	7·1	6·1	6·1	6·0
Breadth of aperture ...	4·8	5·3	5·2	4·9	4·3	4·1
Number of whorls	8½	9	8¾	8¼	8¼	8¼

Theobald's specimens are labelled " Salt Range." Those collected by Dr. Hora are from Kallar Kahar, Sardhi, Katas and Chalisa, all places in the same range and in the Jhelum district of the Punjab. Many of the specimens from Kallar Kahar were taken alive. They were attached in large numbers to tree-trunks in an apparently comatose condition, but we can see no trace of an epiphragm.

We have already suggested that local differences occur in the proportionate number of dextral and sinistral shells. The following are the facts on which we rely :—

In Theobald's series, the precise find-spot of which is unknown, the 22 specimens are all dextral. Combining this series with those obtained by Dr. Hora we have examined 154 shells. Of these 97 are sinistral and 57 dextral. In the total number, therefore, about 63 per cent are sinistral. If, however, we take the members of the series from different localities separately we find very different results. Of 48 shells from Sardhi 46 are sinistral and only 2 dextral, giving a percentage of nearly 94 per cent sinistral, while of 12 shells from Katas only 2 are sinistral, giving a percentage of only a little over 16 per cent. In a series of 70 shells from Kallar Kaḥar 49 are sinistral and 21 dextral, giving a percentage of about 70 per cent sinistral. Two shells from Chalisa station in the plains at the base of the range are both dextral. These shells are " dead " and may have been brought down from the hills in a flood.

We have to thank Professor P. C. Mahalanobis of the Calcutta Presidency College for the note on the mathematical significance of these figures printed immediately after this paper. His investigation seems to prove that the difference in the proportionate numbers of dextral and sinistral shells in different localities is not merely apparent.



TEXT FIG. 3.—Jaw of *Buliminus dextrosinister*, sp. nov.
TEXT FIG. 4.—Radular teeth of *Buliminus dextrosinister*, sp. nov.
c. Central ; *l.* laterals ; *m.* marginals.

Pupoides coenopictus (Hutton).

1914. *Pupoides coenopictus*, Gude, *op. cit.* p. 259.

Two " dead " shells were obtained by Dr. Hora at Chalisa station. Others from Theobald's Salt Range collection are in the Museum.

Pupoides lardeus (Pfeiffer).

1855. *Bulimus lardeus*, Pfeiffer, *Mart. Chem. Conch. Cab., Achatina* I, p. 151, pl. xxxix, figs. 14-16.
1876. *Bulimus coenopictus*, Hanley and Theobald *nec* Hutton, *Conch. Ind.*, pl. xxiii, fig. 9.
1914. *Pupoides lardeus*, Gude, *op. cit.*, p. 261.

There has been confusion about this species. Gude (*op. cit.*) cites Hanley and Theobald's figure in the synonomy of *P. coenopictus*, but

these authors state that they consider the types of *P. lardeus* to belong to *P. coenopictus* and their figure agrees with Pfeiffer's figure of the former species rather than with specimens of the true *coenopictus* from Quetta, from Hutton's collection and probably identified by him. We take it, therefore, that Hanley and Theobald did not figure the true *coenopictus*.

A single fresh specimen was obtained by Dr. Hora on the banks of the Katas nallah. The specimens from the Salt Range recorded by Nevill in his " Hand List " as *Pupa* (*Leuchochila*) sp. probably belonged to this species, but we have been unable to find them.

No precise locality seems to have been assigned to *P. lardeus* hitherto. It may be endemic in the Salt Range.

Opeas gracile (Hutton).

1914. *Opeas gracile*, Gude, *op. cit.*, p. 355.

A single empty shell was obtained by Dr. Hora at Chalisa station in the plains at the base of the Salt Range.

Zootecus insularis (Ehrenberg).

1906. *Zootecus insularis*, Pilsbry in Tryon's *Man. Conch.* (2) XVIII, p. 106. pl. xxvi, fig. 21.
1914. *Zootecus insularis*, Gude, *op. cit.*, p. 367.

Shells from the Salt Range are all white and opaque, but none seem to be quite fresh. They exhibit an extraordinary individual variability apparently not correlated in any way with locality. This is clearly shown by the series of measurements given below and in our figures. They were taken on fully formed specimens from two localities, namely, Sardhi on the hills, and Chalisa station in the plains at their base, both in the Salt Range, Punjab.

Dr. Hora also obtained specimens at Katas nallah.

SARDHI.			CHALISA.		
Height of shell in mm.	Greatest diameter of shell in mm.	Number of whorls.	Height of shell in mm.	Greatest diameter of shell in mm.	Number of whorls.
14·5	4·8	9⅓	15·0	5·0	9⅓
14·0	5·0	9	14·1	5·1	9
14·0	4·9	8½	13·5	5·0	8¾
12·6	4·3	8⅓	13·0	4·8	9
12·0	4·0	9	12·3	4·3	8⅓
11·1	4·2	8⅓	11·4	5·0	7¾
11·0	4·5	8½	11·2	4·9	8
10·0	4·3	8	10·7	4·4	8½
10·0	4·2	8¼	10·5	4·6	7⅓
9·8	4·0	8	10·3	4·8	7½
9·7	4·3	8	10·2	4·5	8¼
9·5	4·4	8	9·4	4·9	7
8·9	4·0	7½	9·4	4·0	8
8·8	4·2	7½	8·5	3·8	7½
8·8	4·0	7½	8·1	4·0	8

In one specimen the epiphragm remained complete. It had the form of a thin calcareous plate occupying the extreme outer part of the

mouth and somewhat convex externally. Towards the upper extremity there was an elongate transverse hole. Further into the shell there were at least two similar plates separated by short intervals, both with similar holes. The soft parts had completely disappeared but we extracted an embryonic shell. Possibly the hole had been made by some enemy which had devoured the snail.

Succinea crassinuclea, Pfeiffer.

1878. *Succinea crassinuscula*, Nevill, *op. cit.*, p. 212.
1914. *Succinea crassinuclea*, Gude, *op. cit.*, p. 453.

The specimens recorded by Nevill from the Salt Range under the name *Succinea crassiuscula* are still in the collection.

The species occurs at Simla as well as in the localities recorded in the works cited above.

AQUATIC SPECIES.

GASTROPODA.

Amnicola (Alocinma) pulchella (Stoliczka).

1836. *Paludina pulchella*, Benson, *Journ. Asiat. Soc. Bengal* V, p. 746.
1876. *Bythinia pulchella*, Hanley & Theobald, *op. cit.*, p. 18, pl. xxxviii, figs. 5, 6.
1922. *?Digoniostoma pulchella*, Baini Prashad, *Rec. Ind. Mus.* XXIV, p. 17.

This species is a true *Alocinma*, but the structure of the operculum is very liable to be obscured by erosion or the deposit of extraneous matter. The specimens from Manipur recorded under this specific name by Annandale[1] belong to the genus *Digoniostoma* as stated, but not to Stoliczka's species.

Theobald obtained shells in the Salt Range and Dr. Hora collected a large series of living specimens in a small stream at Watli as well as empty shells from Katas Nallah and Chalisa. The shells are large and well formed.

Melanoides flavidus (Nevill), Annandale and Prashad.

1919. *Melanoides pyramis* var. *flavida*, Annandale & Prashad, *Rec. Ind. Mus.* XVIII, pp. 29, 30, 34, figs. 3b, 4d, pl. iii, fig. 6, pl. iv, fig. 6.

The shape of the mouth of the shell in this form is so distinct that we prefer to regard it as a separate species. The columella is considerably longer and less arched than in the forms we leave in *M. pyramis* and its callus is thicker and more porcellaneous. The base of the body-whorl recedes much more abruptly on the ventral surface and the outer lip projects far beyond the level of the columella. The form *luteomarginatus* has the same characters and must be regarded as a variety of *flavidus*.

Many of the shells collected by Dr. Hora in the Salt Range are quite typical. Others are larger than any hitherto measured and of an almost uniform dull olivaceous colour. Unicolorous specimens of smaller size also occur together with typical shells. The largest in the collection is 38 mm. long by 13 mm. in maximum transverse diameter. Its apex is slightly eroded.

[1] *Rec. Ind. Mus.*, XXII, p. 541, (1921).

Dr. Hora obtained living specimens in the Katas Nallah, in a small stream at Shivganga and at Choa Saidan Shah.

The species has been known hitherto only from the desert region of southern Baluchistan, from S. Seistan and from Iraq.

Limnaea acuminata Lamarck.

1921. *Limnaea acuminata*, Annandale & Prashad, *Rec. Ind. Mus.* XXII, pp. 568, 569, fig. 12.

Shells from the Salt Range are mostly typical, showing considerable variation in shape, but not quite to the same extent as the series from the United Provinces figured in the paper cited. None are of very large size and some are distinctly dwarfed, but none exhibit any marked abnormality in form or structure.

Specimens taken among algae and weeds growing on a rocky bottom in the Katas Nallah have moderately thin shells of a pale luteous colour and not exceeding 26 mm. in length and 15 mm. in maximum transverse diameter. Those from Shivganga are similar. Shells from the banks of a stream at Choa Saidan Shah are slightly thicker and broader in proportion, while those from another stream at Dheri Jaba are very small, thin and rather narrow, not longer than 15 mm. or broader than 6·5 mm. Dr. Hora noted that a mineral deposit of the nature of tufa was being formed on the bottom of this stream.

Limnaea luteola Lamarck.

1921. *Limnaea luteola*, Annandale and Prashad, *op. cit.*, p. 566.

Distinct as are extreme forms of this species from those of *L. acuminata*, many shells appear to be intermediate, and we have not been able to find any constant difference in the radula or the soft parts. Indeed these structures seem to be almost as liable to variation as the shell.

Dr. Hora obtained a good series of specimens from a stream near Kallar Kahar.

Limnaea persica Issel.

1919. *Limnaea persica*, Annandale and Prashad, *Rec. Ind. Mus.* XVIII, p. 41, pl. v, figs. 3-6.

Hitherto recorded only from Southern Persia and the Baluch desert, this species appears to have a wide range in the Himalayas and beyond. We find numerous specimens in the collection from Peshawar, from Bhim Tal and Naini Tal (4,500-7,000 feet) in Kumaon and also from Secunderabad in the Deccan. Specimens from Kumaon and from Secunderabad have been confused with *L. acuminata*, with shells of which they were mixed.

Dr. Hora obtained two living shells from a stream near Dheri Jaba and a few dead shells on the banks of the Katas Nallah.

Indoplanorbis exustus (Deshayes).

1921. *Planorbis exustus*, Germain, *Rec. Ind. Mus.* XXI, pp. 26, etc., figs. 1-16.
1923. *Indoplanorbis exustus*, Rao, *Rec. Ind. Mus.* XXV, pp. 199—219, many text-figs.

Specimens from the Salt Range are of moderate size and rather pale colour, but not otherwise remarkable.

Dr. Hora found the species living in a pond near Watli and in a stream near Kallar Kahar. He also obtained empty shells at many localities in the range.

Gyraulus convexiusculus (Hutton).

Gyraulus euphraticus Mousson.

1919. *Gyraulus convexiusculus and Gyraulus euphraticus*, Annandale & Prashad, *op. cit.*, pp. 52, 40, 53, 55, figs. 5c, 5f, (*not* 5d), 7, 8a, 8b.

These two species occur together in the Salt Range as in so many other localities. Several " dead " shells of each were found on the banks of the Katas Nallah.

Gyraulus saltensis Germain.

1922. *Gyraulus saltensis*, Germain, *op. cit.*, p. 127.

We assign to this species with some doubt several empty shells found with those of the preceding two species on the banks of the Katas Nallah. The type has not yet been returned to Calcutta and no figure has been published.

Gyraulus labiatus (Benson).

1915. *Planorbis* (*Gyraulus*) *labiatus*, Preston, *Faun. Brit. Ind., Fresh W. Moll.* p. 119, fig. 5.

Dr. Hora collected a large series of living specimens in the Katas Nallah. They exhibit considerable variation in the degree to which the last whorl is deflected, but otherwise agree with Preston's figures of the type-specimen.

To judge from specimens recently examined by us, *G. labiatus* is widely distributed in northern and central India.

PELECYPODA.

We are obliged to Dr. Baini Prashad for the following note on the bivalves collected by Dr. Hora in the Salt Range :—

" 1. The Unionidae from Choa Saidan Shah, Salt Range and Katas Nallah (Sta. 4) are all dead shells of the very widely distributed *Indonaia caeruleus* (Lea). There is no complete shell but only stray valves of different specimens.

2. The Cyrenidae from Katas Nallah (Sta. 4) and Jhelum district, are all either young or highly worn shells of the common species *Corbicula striatella* Desh., which is also a very widely distributed species.