

NOTICES, ABSTRACT AND REVIEWS

A NEW LOOK AT THE ATTOCK SLATE SERIES

A few papers on this topic have been published by the author before, which have yielded mere informations on the results of the work carried out from time to time. Now the whole of the Attock — Cherat Range greater part of which exposes slates has been mapped on 1" = 1 mile scale map and various lithologi-

cal units, having separate entity in the series, have been differentiated. This note is intended to provide a preliminary result on the stratigraphy of the Attock Slate series — based on the author's observations. A detailed paper on this work is being prepared — which will be published in the next issue of this Bulletin.

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| | (c) Soft, maroon, very coarse sandstone and sandy shales (material derived from the Murrees). | |
| 12. | (b) Yellowish green soft friable sandy shales (material derived from Paleocene Shales) | (Lower to Middle Pleistocene ?) |
| | (a) Soft, light coloured gritty sandstone (material derived from the crystalline rocks) | |
| 11. | Red maroon sandstones and Shales. | Murree Formation (Miocene) |
| | (b) Limestone, medium to dark grey thin bedded, sandy at the top and has shale partings. | Kohat limestone (Lr. Eoc.) |
| 10. | (a) Claystone, brown, gritty, and contains fragments of chert in sandy matrix. | Mamikhel clay (Lr. Eoc.) |
| 9. | (b) Grey to dark-grey also yellowish brown limestone, fine to medium, compact, nodular; shale parting in the lower and upper portions, thick bedded where there are no shale partings, a marly zone usually at the base. | Lockhart limestone (Paleocene) |
| | (a) Gritstone, brown and white, contains fragment of chert in sandy matrix. | |
| 8. | Light grey to white calcareous shale and marl; hematite lenses with typical brown tinge. | Kawagarh Marl ? (upp. Cretaceous) |
| | (b) Thin bedded, at places nodular also, yellowish brown crystalline limestone with manganese dendrites and stylolites. | Lumshiwal Formation (Middle Cretaceous) |
| 7. | (a) Thin bedded quartzitic sandstone, white and brown with slaty shales intercalations, and containing specks of limonite. | |

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| 6. | Yellowish green friable arenaceous and calcareous shales with limestone partings. | Chichali Formation?
(Lr. Cretaceous) |
| 5. | Yellowish brown crystalline limestone, medium to fine with limonitised patches and manganese dendrites, commonly occurs as pockets in the Attock shales. Rarely fossiliferous. | (Lr. Cretaceous) |
| 4. | Light to dark grey friable splintery slaty shales with siltstone intercalation; discontinuous band of yellowish brown impure limestone over the top, which are fossiliferous and contain shells of pelecypod and gastropod. Ripple marks and cross beddings are common. Specks of limonite and hematitic concretions are well marked. | Attock Shales (Mid. Jurassic to Cretaceous) |
| (b) | Thin bedded calcareous shale and marl; yellow, green, pink, and grey colours common; considerably squeezed with usually obliterated bedding plane. Carbonaceous lenses not uncommon. | (Rubbly limestone)
(Lr. Jurassic?) |
| 3. (a) | Thin grey to black limestone, containing marbalized bands; quartz veining common, surface shows rubbly texture but fresh faces are homogenous. Thin argillaceous streaks along the bedding plane common. Rarely fossiliferous. | } |
| 2. | Thin bedded, white to light green dolomite and dolomitic limestone (dominant) with maroon slaty shales, yellowish brown crystalline limestone and glauconitic siltstone. | Kingriali Formation
(upp. Triassic) |
| 1. | Slate and phyllite (dominant) with yellowish brown and grey crystalline limestone pockets observed in the eastern outcrop, containing intrusions of dolerite and quartz veins. Impure soapstone lenses, carbonaceous pockets and decomposed specks of limonite are well marked. Ripple marks and cross bedding are common. | Manki Slates (Lr. Paleozoic) |

The above listed are some of the broad divisions and some of them may further be subdivided for which remapping of this area is contemplated on 4"=1 mile scale. Structurally the area is very much disturbed and this large scale map will help in determining the minor structural features which previously had created several problems.

Most of the younger formations (Eocene to Pleistocene, except Palaeocene) are concentrated along the western flanks of the Cherat ridge. The shales identified as Chichali Formation (?) are confined in a few interesting sections along the eastern bank of the Indus. Lumshiwai Formations are exposed in the ridge over-looking the Nizampur valley. Most of the prominent ridges are composed of Attock Shales unconformably overlain by Lockhart limestone. These shales, on the basis of fossils, identified by U.S.G.S. expert, range in age from Mid. Jurassic to Cretaceous.

The Rubbly limestone with calcareous shales on the top (3) which usually separates the Manki Slates from the Attock Shales is tentatively placed in the Lower Jurassic. Very recently some fossils have been found in this formation - which have been sent to U.S.G.S., Washington for examination and results are being awaited. In a few sections, along the western flank of Cherat ridge the Rubbly limestone is found in close association with Kingriali Formation and their contact

is gradational. This is suggestive of the fact that the Rubbly limestone may be Lower Jurassic in age.

Kingriali Formation is represented in this area by dolomite and dolomitic limestone overlain by brown argillaceous limestone which has got gradational contact with the former. Maroon slaty shales are another member which rank second in order of abundance and are found interfingering with the dolomite. Greenish grey glauconitic sandstone is also associated with this formation and is not extensive in development. Previously the Kingriali Formation was only reported from the southern marginal outcrops - along both the banks of the Indus - but this survey has, located the Kingriali Formation on the western flank of Cherat ridge - where it is found associated with the Rubbly limestone.

During this investigation an attempt has been made to solve the major problem pertaining to the stratigraphy and the age of the Attock Slate series. Now on the basis of this investigation the old conception about the Attock slate series, that they are undifferentiated and are Precambrian in age has got no ground to stay. The author has also covered some parts of the south western Hazara and Khyber Pass - and in these sections a few formations (the oldest four) are represented - which confirm that they are in homotax with the Attock slate series.

R. A. Khan Tahirkheli