

The specimens, which were collected over a wide area, show considerable differences in their gross characters but a general similarity in their mineralogical composition, and it is not possible to draw any conclusions as to the original source of the material. Further, although composite grains form a large proportion of the specimens, they are very varied in character and no particular type can be assigned to any one area. An exception to this is shown by specimens 107 and 108 from south of Marāl-bāshi. In these sands, flakes of a dark brown rock occur, and an examination of the mechanical analysis shows that they could not have been deposited at the same time as the sand grains and that they are probably products of desquamation of the underlying rock. [See above, i. p. 86, as to the significance of this observation.—A. STEIN.]

Mechanical analyses also suggest in several other instances the admixture of material from two sources. For instance, in specimen 136 we find well-rounded grains ranging from .2 mm. to 2 mm. mixed with subangular pebbles varying from 5 mm. to 15 mm. The small grains were no doubt wind-borne and deposited by that agency among the pebbles brought down by torrents from the mountains. Specimen 137 from the same locality, Bēsh-toghrak, also consists of two distinct fractions, viz. well-rounded grains from .7 mm. to 3 mm. and a fine light brown mud. This specimen occurs as a 'stratum in clay', and the grains represent a temporary influx during the continuous deposition of the clay. Another type is represented by specimens 126, 128, 129, and 144, in which well-rounded grains ranging from .5 mm. to 3 mm. are mixed with fine powder less than .2 mm. in diameter containing abundant gypsum and some salt.

A further type in which the two well-defined fractions are somewhat similar in character is represented by specimens 117, 118, 125, and 143. Here, subangular to rounded grains ranging up to .4 mm. are mixed with grains from .7 mm. to 2 mm. in diameter.

A study of the occurrences of the heavy minerals does not yield much information. Green amphibole, the micas, and magnetite are prominent in the heavy crops from all localities, and only on rare occasions do other minerals become abundant, notably garnet in Nos. 113 and 133. Other minerals which are persistent in smaller amounts are apatite, epidote, hypersthene, sphene, tourmaline, zircon, and brown and colourless amphibole. The metamorphic minerals cyanite, staurolite, sillimanite, and chloritoid were noted only in the western half of the area, as also was augite, while andalusite, rutile, spinel, glaucophane, and diallage were rarely observed.

Quartz is of course always predominant, and there is invariably abundant orthoclase, with less microcline and still less plagioclase. Microcline is strikingly abundant in No. 112.

Haloed in biotite were observed in only two specimens (Nos. 112, 113), both from the Vāsh-shahri district.

Many measurements were made on quartz grains in order to determine the lowest limit of rounding by the agency of wind; the smallest grain to show anything like perfect rounding measured .39 mm., and there were many with diameters between .40 and .45 mm.