



SURFACE TEXTURE OF QUARTZ GRAINS FROM DIFFERENT
SEDIMENTATION ENVIRONMENTS IN THE NORTH-WESTERN ARGENTINE

Karsten Garleff (a)
Alojzy Kowalkowski (b)
Helmut Stingl (c)

In the soil samples taken from five sites in the north-western Argentina, between 28° and 35° of southern latitude, petrographic composition was determined both of the light fraction of a grain-size range from 0.5 to 0.8 mm as well as of the heavy fraction of a grain diameter of 0.06-0.20 mm. Analysis of rounding was performed under the scanning microscope of the quartz grains of a diameter of 0.5-1.0 mm along with the morphoscopic analysis of the quartz grain surfaces of the 0.6-0.8 mm fraction.

On the Sierra de Córdoba granite plateau, at the Pampa de Achala site /32°S/, acid soil material consists of grains and detritus of granitoids and of effusive rocks. Quartz grains show no signs of mechanical processing what testifies to the short-distance transport of the detritic material and to the proximity of the parent rocks. On the surface of these grains there prevail the features of recent and ancient thermal-block and grain-like desintegration. The cold-environment splittings and breakages are scarce. Cavities of different sizes as well as scattered or linear etchings both fresh and coated with silica crusts were produced under conditions of changing hydratation status in the wastes and soils.

At the Sierra de Manzan /28°S/ site, the alkalic sediments of the intermontane basin of the Rio Salado river consist both of slightly rounded grains and breakages of schists and granitoids of local origin as well as of the medium-rounded allochthonic ones. Also, there dominate here the grains showing features of thermal-block and plate desintegration and of hydrothermal and mechanical chipping and breakage. Exfoliation-, aeolian processing- or water transport surfaces are only sporadically encountered, the features of processing on the lake shore being equally rare. Numerous are the caverns of different sizes produced by chemical weathering, these caverns being fresh or crust coated. On the grain surfaces, porous and weathered crusts are also visible.

Sediments at the Medanitos site /27°S/ are also alkalic, they are built of granitoid grains and breakages, schists and volcanic rocks. Quartz grains with sharp edges are, as rule, of local origin. However, a part of these grains -medium- and well rounded originate from the long range transport. The dominating thermal grain-like disintegration as well as polygonal splittings of the silica coatings constitute here the characteristic feature



of the grain surface parallelly to thermal exfoliation of extensive surfaces. The rounded grains show traits of aeolian processing. Caverns with porous silica coating as well as thick crusts on the grain surface were produced by intense chemical processes in the humid and arid environments.

Soil material from glacier moraines, in the samples from Vallecitos /35°S/ westward from Mendoza and from the Arroyo Oscuro /35°S/ in the Rio Atuel Valley, consists mainly of grains and detritus of granitoid-, effusive- and metamorphic rocks of local and allochthonic origin with or without features of mechanical processing. On the surfaces of quartz grains, the features are encountered of the glacier-, cryomechanical- and aeolian processing as well as of the thermal exfoliation. Numerous are also pitted areas and -caverns as well as ribbings and crusts produced by the ancient intense chemical weathering. Thin, cracked silica coatings of recent origin are visible on the fresh grain surfaces

- (a) Dept. of Physical Geography, Univ. of Bamberg
Postfach 1549, D. 8600 Bamberg, W. Germany.
- (b) Forest Research Institute, Dept. of Soil Sciences and
Fertilization. Sekocin, 05-550 Reszyn, Poland.
- (c) Institut für Geowissenschaften Universität Bayreuth
Postfach 3008
8550 Bayreuth Germany Rep. Federal de Alemania