Slope movement landforms in and around Mount Shirouma-dake and Mount Asahi-dake, northern Hida mountains, Japan.

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Numerous slope movements (landslides) occur along the main ridge around Mount Shirouma-dake (36.46 N, 137.46 E, 2932 m asl) in the northern Hida Mountains, central Honshu Island, Japan, where ice fields and valley glaciers had evolved during the last glacial age. Although these slope movements have been described, their historical development and the principal cause of movement have not been discussed fully. Slope movements might be formed as an expression of rapid paraglacial adjustment in the stage of deglaciation. Similarly, in view of recent pursuits that present-day or fossil permafrost occurs in the Japanese alpine slopes, it is considered that some of slope movements distributed in this area would be induced by permafrost (or an active layer) sliding related to climatic changes. To clarify the late Quaternary development of slope movement landforms, more data are required. In this meeting, we present preliminary but important information from our investigations.

The most prominent case was found from Nagaike, a small pond 2 km north of Shirouma-dake. On the basis of detailed airphoto interpretations and field investigations, a large slide (0.89 sq km) encompassing Nagaike seems to have been initiated by downslope separation of the main ridge (2750 m asl) 1.4 km east of the pond. Present-day altitude of landslide toe is at 2150 m asl. The landslide mass is mainly composed of poorly sorted sand and angular gravels with fines having faulting and folding. Upon the landslide mass as well as surrounding mountain slopes, there are linear or crescent-shaped depressions, suggesting complex stress fields inside and outside the landslide area. Chronological data are insufficient but a date of buried humic soil (7585-7433 cal BP), sampled close to Nagaike, strongly deformed by landslides, indicates that the slope movement took place after the middle Holocene epoch. Another information about tephrostratigraphic relations and radiocarbon dates of alpine humic soils in this area suggest that most slope movements occurred in the early Holocene or before, but the last glacial is doubtful. In addition to this example, many gentle slopes with various magnitudes are developed. The previous authors considered that most of these forms were related to glacial advances in the last to late glacial period. Nevertheless, they seem to be formed by landslides initially, or deformed secondary. Concerning this, a reappraisal is needed.

A research on slope movement landforms is important, as it is one of subject matters of not only geomorphology but also erosion control planning. The Shirouma-dake area is far from dense population cities so that future slope movements will not cause severe damage promptly. However, break of a landslide-induced natural dam might produce fatal destruction of power plants and dams in the lower catchments. Spatio-temporal prediction and risk evaluation of slope movement are also necessary.