altitude whether the change is natural or simulated was also confirmed. The difference might be attributable to the fact that each oxygen molecule occupies a larger space in the lower pressure (higher altitude) situation. The corollary of this seems consistent, i.e., the lower rates of uptake observed at low temperatures and low altitudes might be attributable to the denser packing of oxygen molecules which presumably occurs under those conditions.

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Effect of Visitors on Alpine Ecosystems in the High Tetons

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The work done in the summer of 1958 had been of an exploratory nature with emphasis on the flora of the region and on general observations of the vegetation and visitor impact. As a result of these observations, Lake Solitude was found to be, as had been suggested by the Grand Teton National Park staff, a region of critical importance in terms of modification through use. Two sites in upper Leigh Canyon were found to be comparable and relatively inaccessible. These three regions were chosen as the sites for further intensive research. Reconnaissance observations were made in other canyons of the Teton Range and, for comparative purposes, in the Bridger Primitive Area of the Shoshone National Forest.

Continued exploratory work was done in the summer of 1959 including observations, some by airplane, of additional canyons in the Tetons and also in comparable areas in the Front Range of Colorado and the Beartooth Range in Wyoming and Montana. The last two have been, or are now being, intensively studied from the ecological viewpoint and should provide comparative data of considerable interest. With special regard to the Lake Solitude and Leigh Canyon sites, the work involved (1) the study of patterns of snow melt, (2) more extensive reconnaissance observation with special emphasis on phenological phenomena, (3) the selection of sites for microclimatological, soil and vegetational studies and the partial installation of the planned instrumentation program, (4) collection of air temperature data and soil profile samples on these sites, (5) the establishment and inventory of list-count quadrats on these sites and (6) the selection of sites for exclosure studies.

General observation trips to comparable sites were made in the Medicine Bow Mountains on June 21 and 22, in the Colorado Front Range on June 24 and 25, in the Big Horn Mountains on June 28 and 29 and in the Beartooth Range on July 15. Plant collections were made on all these trips.

Collections and general observations in the Teton Range itself were made on July 16-19 in Alaska Basin, South Cascade Canyon and Death Canyon. On August 31, observations were made in upper Teton Canyon. Aerial observations from a plane were made over the Teton Range in general on August 31.

Snow ablation was studied by means of black-and-white and color photographs. Full or nearly full series were taken on May 31 and June 1, July 2, July 6, July 11, and July 21 and partial series at intervals thereafter. With the aid of the base map prepared last year and corrected this year, the pattern of snow ablation with time will be described. Ground observations of snow were also made to determine the nature of persistent snow, particularly in relation to avalanche snow.

Beginning August 5, 14 stations were set in various locations which contained maximum-minimum recording thermometers. These were read at weekly intervals. Soil samples were taken at some sites for moisture content, and at others as samples for chemical and physical study. Vegetation was recorded by general observation or in list-count quadrats in groups of four.

Appropriate sites for exclosure studies to be made next summer were located. These include (1) a meadow type in which no effects of use are apparent, (2) a badly deteriorated meadow site, (3) a ridge site with apparent change, (4) a ridge site crossed by a trail which can be closed without interferring with transportation, (5) two campfire scars of comparable age, (6) a heavily trampled grove of trees and (7) one not used heavily.

Additional plant specimens, particularly the fall blooming species which were poorly known, were collected, preserved and added to the reference collection. These are now being prepared for identification by consultants.

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