Fungi of Mount Shasta.

(1936—1951).

By Wm. Bridge Cooke.
(Mycologist, Microbiology Section, Robert A. Taft Sanitary Engineering Center, U.S. Public Health Service, Cincinnati 26, Ohio.)

Introduction.

In a recent paper (9) certain brief notes were published concerning the ecology of the fungi of Mt. Shasta. These notes were limited to a discussion of the fungi in relation to the Merriam Life Zones, along with a few other brief items. In order to present a more detailed picture of the mycobiota of the mountain the following paper will present a few notes on the vegetation zones of the mountain followed by a host index to the fungi and a systematic list of the fungi including a discussion of the place of each species in the mycobiota in so far as known from the writer's collections and observations between 1936 and 1942 and in 1946 and 1947. Additional collections found in various herbaria, references in the literature, and a few collections made by the writer since 1947 are included to present as complete a picture as possible.

It is thought that Mt. Shasta forms a good basis for such a report since it is an isolated peak and the fungi and flowering plants (2, 6, 10) which grow upon it have been collected co-extensively during eight summers during which the writer lived at Horse Camp as custodian of the Shasta Alpine Lodge for the Sierra Club of California.

The Area Covered.

Location.

Mt. Shasta, a dormant volcano of the Cascade Range, is located in south central Siskiyou Co., in northern California. The limits within which collections have been made most intensively include the area above 4000 feet. In general, this is bounded on the west, south and east by a series of connecting roads through the chaparral between Mount Shasta, McCloud, Widow Springs and the Military Pass. From Andesite to Black Butte Station the area is bounded by the Southern Pacific Railroad, and between Black Butte Station and Mount Shasta by lanes through the brush fields east of Black Butte. This area roughly includes about 100 sections of land. It falls within the Mt. Shasta Recreation Area of the Shasta National Forest. The elevation
differential in the area is 4000 to 14,161 feet although few fungi have been collected above 10,000 feet.

Less than five per cent of the surface of the mountain is covered by vegetation directly affected by irrigation from springs and creeks which form meadows.

**Vegetation Zonation.**

To understand further the several habitat types found on the mountain the following summary of vegetation zonation is presented. This summary follows, as closely as possible, Daubenmire's system (17).

**Alpine Zone**

In the sense of Daubenmire (17) an "alpine tundra" occurs on the mountain but this is limited to sparse and scattered growth of numerous herbs and low woody perennials. If this zone is understood as including only that growth above the White Bark Pine zone then no shrub formation occurs in it. If it includes that growth above economic timberline, then, in association with white bark pines which occur as low shrubs, several of the shrubs associated with the white bark pines occur in it. The zone reaches from a ragged line of from 8000—10,000 feet to the summit of the mountain at 14,161 feet although flowering plants have not been found above 13,000 feet and the upper parts of the mountain appear to be inhabited solely by such plant life as thermal algae, red snow, and some lichens. Two principal types of habitat occur for plants: open sandy or gravelly lava flats which may be level or inclined, and cracks between boulders and beside rocks where moisture is held longer than in exposed places, While Draba breweri has been reported from as high as 13,000 feet, the highest record for a flowering plant on the mountain, no species is confined to this zone since all species found in it have also been found in the White Bark Pine zone and some species even as low as the Shasta Fir-Mountain Hemlock zone. In this zone springs and streams support no vascular vegetation.

Above the limits of woody plant growth, including white bark pines of a foot or less in height, few or no areas exist which contain the proper conditions for meadow or tundra formation. Water melting from the snow percolates so rapidly that no sod-forming plants have been able to become established. In some sandy openings in boulder fields, especially on gentle slopes where fragments of pumice bombs color the ground yellow, Carex breweri forms meadowlike patches; this plant forms clumps which enlarge year after year but the clumps are scattered in areas occupied by this species. Possibly this is the initial stage in a succession leading to a meadow. In the Shasta Fir-Mountain Hemlock and White Bark Pine zones Juncus parryi...
inhabits more sheltered areas which remain covered with snow banks longer than less sheltered areas.

*Phyllodoce empetriformis* forms loose mats on level places or steep hillsides and gullies which receive a small amount of moisture from seepage after the snow has melted. However, in the colonies observed, except in the meadows to be described below, little soil, and no meadow had formed. The same conditions in a more restricted manner accompany colonies of the shrubby *Pentstemon menziesii* var. *davidsonii*, *Lutkea pectinata* and *Saxifraga tolmiei*.

At the moist side of rocks and boulders where a soil has formed through protection from wind erosion and evaporation of soil moisture numerous plants grow throughout the rock slopes from 8000 to 13,000 feet, although more and more sparsely above 10,000 feet. Other plants grow in more open places where the mountainside has formed a talus slope. Such conditions are common below 9000 feet and especially in the following zone.

**White Bark Pine Zone.**

This zone includes that area on the mountain in which trees occur at the highest altitude reached by woody plants even though at that altitude white bark pines may be no taller than six inches. Quantitative studies have not been made but by observation more than ninety per cent of the „forest“ of this zone is composed of *Pinus albicaulis*. This zone follows ridges up to 10,000 feet and in some valleys remains as low as 8000 feet. In between these widely varying types of habitat the areas unfavorable for white bark pine growth are occupied by sparse vegetation of the Alpine zone. Particularly on the west and north slopes of Shastina this zone is best developed. Here on more or less gentle slopes uninterrupted by stream beds the forest forms a densely matted thicket ten feet high and gradually reduced to less than a foot high above. In these thickets, as elsewhere in this zone, dead branches of the trees throughout the snowless season are hard, dry and brittle.

On ridges and in valleys a few stunted Shasta firs occur with the white bark pines while one tree of *Abies concolor* has been observed on a ridge south of Horse Camp in this zone. Where hemlocks (*Tsuga mertensiana*) grow on the mountain they penetrate into this zone especially above Panther Creek, above Squaw Valley Creek, and north of Diller Canyon on Shastina. A number of shrubs also occurs in this zone. They may be found on exposed slopes as in the case of *Juniperus communis* var. *montanus*, they may form colonies isolated from the conifers by local conditions as in the case of certain large mats of *Holodiscus discolor* var. *glabrescens*, or they may occur in colonies intermingled with the white bark pines such as the mats of *Arctostaphylos nevadensis* and *Castanopsis sempervirens* in the
area between Cascade Gulch and Squaw Valley Creek. Occasional plants of *Haplopappus bloomeri* var. *angustatus* also occur in this zone. On the north bank of Diller Canyon a long tongue of chaparral pushes to the upper limits of this zone. This tongue includes representatives of most of the chaparral species to be found on the mountain. *Cercocarpus ledifolius* occurs in this zone on the north side of Shastina as does the only colony of *Populus tremuloides* on the mountain.

Below timberline, and in the timberline area, occasional springs occur around the mountain. Of these the highest occur above Horse Camp and above Panther Creek Meadows. Eight springs have been found in the area between Cascade Gulch and Squaw Valley Creek. One spring occurs in Diller Canyon and a number of springs along the bank of Mud Creek Canyon irrigate hanging gardens. The flow from these several springs is small and percolates within a few feet to a hundred feet or more from the source.

Squaw Valley Creek meadows originate in springs near the central part of this zone. Additional springs increase the flow of the stream as it descends through the meadows.

**Shasta Fir-Mountain Hemlock Zone.**

**Shasta Fir Association.**

**Shasta Fir-Mountain Hemlock Association.**

This is the most extensive zone on the principal slopes of the mountain. It is the Mt. Shasta version of Daubenmire's Fir-Mountain Hemlock zone of the Cascades. It comprises a forest belt extending at times for nearly 3000 feet in altitude. On the southwest side of the mountain the Shasta fir forms a pure stand penetrated only by an occasional specimen of *Pinus monticola* (only one has been observed in the southwest quadrant of the mountain) and by occasional species from zones above and below. From above, occasional white bark pines reach down into favorable habitats among the Shasta firs where they attain a greater size than in their own zone. Those species from below will be discussed later. In certain areas, especially at Panther Creek Meadows, Squaw Valley Creek meadows and north of Diller Canyon, the Shasta firs are partially or completely replaced by *Tsuga mertensiana*. These occur in dense stands, as scattered individuals, or as about half of the forest constituents in a mixture of Shasta fir. West of Mud Creek Canyon there is a mixed conifer forest in which *Pinus monticola* and hemlock occur with the Shasta firs in about equal quantity. There may be other such instances, where moisture relations and other factors permit. The best of these mixed forests lies between 7000 and 8000 feet on the north side of the mountain on the west bank of Bolam Creek where all the zones appear to be
pushed together. Here *Pinus monticola*, *Pinus albicaulis*, *Pinus contorta* var. *latifolia*, *Pinus ponderosa* and *Juniperus communis* var. *montana* grow together with the Shasta firs (*Abies magnifica* var. *shastensis*). An explanation of these mixed forests can best be made after more careful quantitative and qualitative studies of these colonies have been made.

In the Shasta Fir — Mountain Hemlock Zone a number of local variations produce special tree-shrub associations, or small grassy openings in the forest which could be termed dry meadows. Along small streams originating from springs or in the beds of which the water table is sufficiently high (in the case of intermittent streams) *Acer glabrum* and, sometimes, *Salix scouleriana* and *Cornus californica* form stream-bottom associations. In the heather meadows *Phyllodoce empetriformis*, *Kalmia polifolia* and *Vaccinium caespitosum* form an association which, at times, affects the bed of the stream by building up the bank of the stream. On the south side of Red Butte and in Mud Creek Canyon occur colonies of *Sambucus racemosa*.

Occasional openings occur in the Shasta fir forest. These may be related to the topography of the mountain, and appear to be related to the glacial pattern, although this is obscured by the great accumulation of lava sand and dust probably of morainal character which characterize the soil of these openings. In general, these openings, which range in size from a few hundred feet in diameter to a quarter mile in length and breadth, are characterized by the presence of two species of grasses, *Stipa occidentalis* and *Elymus elymoides* (*Sitanion hystrix*). Forbs are also present. In those openings near Panther Creek Meadows above the Snowline Highway the dominant herb is *Polygonum davisiae*. In none of smaller openings is there enough herbage to present a horse with a good day’s grazing. The grasses occur in scattered clumps and do not form a sod. In such a large dry meadow as the one between Panther Creek Meadows and Wagon Camp at the west end of Gray Butte *Haplopappus bloomeri* var. *angustatus* occurs; this shrub also occurs in similar sandy openings at the east base of the mountain near the Mountainhouse Creek devastated area.

Extensive mats of *Arctostaphylos nevadensis* cover the ground in the climax forests of this zone. Apparently here it, too, is climax in contrast to the seral role assigned it by Oosting and B l i l l i n g s (27) in their description of the Red Fir forests of the Sierra Nevada. In this paper it is indicated that mountain manzanita is an invader after fire. On Mt. Shasta there is little or no evidence of this species invading burned areas exclusively since it is universal throughout this zone especially where Shasta firs form pure stands with no obvious evidence of having been burned. Both Shasta fir and mountain manzanita appear in the zone with old, mature, young and
seedling plants. Shrub invaders after fire are more commonly representative of the seral chaparral to be described below.

Occasionally colonies of shrubs, especially of chaparral shrubs, occur in this zone. This is particularly true of locations which have lost their tree cover through extensive logging, or through the action of fires as a result of logging operations at lower elevations or as a result of lightning. Occasional individuals or colonies of chaparral shrubs may penetrate into the Shasta for zone because of favorable local factors such as exposed ridges, gully walls, etc. Occasional shrubs have migrated up partially wooded slopes to the limits of this zone as in the case of the association observed on the north side of Diller Canyon where a tongue of chaparral has penetrated to the White Bark Pine zone.

Of the springs noted under the White Bark Pine zone only a few overlap into the Shasta Fir zone and these occur mainly along Mud Creek Canyon where hanging gardens are formed along them on the precipitous canyon wall. One spring occurs on a tributary of Cascade Gulch and it percolates within a hundred feet of its source.

The springs which form the source of Panther Creek originate at the upper edge of this zone and springs both along the course of this stream and of Squaw Valley Creek increase the flow of water in these streams through this zone. If springs did not increase the flow of water in these streams percolation would reduce the extent of the meadows along them. The source of the spring water is melting snow; meadows and creeks are less extensive following winters of light snowfall.

Two large heather meadows occur on the mountain. They lie in the valleys of Panther Creek and Squaw Valley Creek. They possess a number of local variations but their pattern in general is the same. Through the meadow, in a meandering fashion and at times building its bed above the surrounding meadow, the clear creeks flow. The creeks are lined by large patches of heather, laurel and huckleberry. This situation occurs throughout the Shasta Fir zone. Panther Creek meadows are characterized by two large and one small meadow area separated by cascades through Shasta fir-mountain hemlock woods. Squaw Valley Creek meadows are characterized by three long narrow meadows separated by cascades, through similar forests, along which heather also grows. In addition to the springs in which the streams and meadows have their origin a number of spring and seepage areas occur along the meadows and cascades which increase the amount of water in the creek and which are characterized by local variations in the meadow plants. The most prominent of these variations is the swale of mountain rush in a depression east of Red Butte along one end of which Squaw Valley Creek flows.
Abies Concolor zone

At the lower limit of the Shasta Fir zone occurs an area of transition between it and the zone to be discussed next. This Zone is characterized especially in the area between Diller Canyon and Mud Creek Canyon by a predominance of Shasta fir and Abies concolor. Locally Douglas fir, ponderosa pine, sugar pine and incense cedar may occur here.

Since this transition occurs on the lower part of the more inclined slopes of the mountain few opportunities are available for meadow openings. However, the Wagon Camp meadows occur mostly in, or just below, this zone. More than in the Shasta Fir zone above, the chaparral penetrates into this area. One unusual shrub association occurs in this area; it is the patch of Vaccinium occidentale which dominates the boggy part of the Wagon Camp swamp, hardly more than a quarter acre in extent.

The best development of this zone lies on the southwest slope of the mountain between Cascade Gulch and Wagon Camp. It can be best seen along the Sisson Southern Trail.

This zone, which on a quantitative basis may later be better considered as an ecotone, is quite narrow where it exists, although where favorable places for the growth of Abies concolor occur, tongues of this transition extend into the Shasta Fir zone. This is especially true where Abies concolor groves have replaced patches of chaparral on favorable slopes. Chaparral extends up into the Shasta Fir zone locally where fire has burned off the forest. When a grove of seedlings of white fir grow up they smother out the chaparral forming an island or tongue of white firs in the chaparral or at the edge of the Shasta Fir zone.

Sierra mixed Conifer Zone.


This zone includes the lower forested slopes of the mountain, except on the north side, and probably at one time occupied those areas now covered with chaparral. Depending on logging conditions, or upon peculiarities of growth, isolated stands of one or more of the species of this zone occur locally. The zone includes Pinus ponderosa, Pinus jeffreyi, Abies concolor, Pseudotsuga taxifolia, Pinus lambertiana and Libocedrus decurrens. Depending upon conditions of logging and fire, tongues of forest reaching down into the chaparral are composed of one or more of these species. On more rugged hill sides and slopes all these species occur together as in the valley of Squaw Valley Creek and in the bed of Mud Creek Canyon where the bed fans out above the dam. While the valley of Cascade Gulch con-
tains a fairly mixed forest of these species, a lava flow just north of it contains a predominance of incense cedar and Douglas fir. At Bear Springs Jeffrey pine and incense cedar predominate, while that portion of Squaw Valley Creek below the McCloud water supply intake contains a Douglas fir-white fir forest, the most luxurient forest on the mountain. On the north side of the mountain east of Bolam Creek this zone extends above its altitudinal limits of the south side (5500 ft.) to about 7000 feet where it blends with the Shasta Fir zone as noted above. On the northeast side of the mountain, where Military Pass is formed between the mountain and Whaleback or Black Crater, a volcanic ridge to the north, Pinus contorta var. latifolia has assumed control of a considerable area of rolling land. This lodgepole pine grove is surrounded on more level places with the ponderosa pine forest while above it merges into the Shasta fir forest. On the south side of the mountain occur several colonies of knobcone pine (Pinus attenuata) in this zone. The trees are scattered and rarely form a solid stand.

In the Sierra Mixed Conifer zone occur the several springs on the southwest and south sides of the mountain with which most visitors are familiar: Bear Springs, at which a large grassy meadow occurs, MacBride Springs and Widow Springs, at both of which are Public Camps. Also in this zone the spring at the base of Squaw Valley Creek forms the intake for the McCloud water supply. Near Black Butte Station, north of Black Butte and near Weed, is a small spring in a group of conifers which percolates near its source.

Seral Chaparral Association.

Portions of the Mixed Conifer Zone are composed of a seral (secondary), rather than a climax (primary), chaparral. Tongues of this scrub reach up into the Shasta Fir zone and even to the White Bark Pine zone. It covers the gentler slopes of the mountain giving them the aspect, from a distance, of a green rolling plain. From the Widow Springs area west and north to the west slopes of Shastina this scrub includes a number of shrubs of which the most conspicuous are Arctostaphylos patula, Ceanothus velutinus, Castanopsis chrysophylla and Prunus emarginata. From somewhat north of Cascade Gulch to the Military Pass this chaparral includes Purshia tridentata. Creeks and springs in this area are characterized by Salix scouleriana, Cornus nuttallii, as well as, occasionally, isolated trees or groves of trees of the zone and other shrub species. This occasional occurrence of trees among the chaparral, in isolated colonies, on rock outcroppings or along creeks, with intervening charred snags or sawed stumps, leads to the conclusion that the chaparral forms a temporary cover as a result of intensive logging and burning of the area. This is especially true of the area south of Diller Canyon.
In the area occupied by the chaparral occur springs from which flow large volumes of water. Above 4000 feet on the mountain the more important of these is the one at Howard which forms the water supply for the City of Mount Shasta. The big springs which enter the Sacramento, McCloud, Pit and Shasta Rivers are not considered here since they occur below 4000 feet.

The recent republication (19) of a report of an ascent of Mount Shasta in 1855 indicates that even in the gold rush days before intensive logging started in the area there was a chaparral vegetation between the community now known as Mount Shasta and the lower forests of yellow and sugar pines.

The U. S. Forest Service has started to reclaim, with some success, some of these chaparral covered areas by planting ponderosa pine seedlings in the area through which the Shasta Snowline Highway crosses the chaparral.

**Ponderosa Pine Association.**

On the north side of the mountain, below 6500 feet, between Inconstance and Bolam Creeks, occurs a large stand of *Pinus ponderosa* in which the forest is open and no other trees occur. It is a tongue of forest reaching up into the Mixed Conifer Zone. It has been logged but not completely and fires have occurred in it more recently than in other forests on the mountain itself. The south and west sides of the mountain, even as low as 3500 feet at the City of Mount Shasta, show no sign of having had a purely ponderosa pine forest since isolated groves of trees in the chaparral and villages are composed of more than one Sierra Mixed Conifer Zone species.

**Cercocarpus-Purshia Association.**

On the north side of the mountain, between the Lava Parks and the Military Pass, thus occupying a larger base than the previous zone, the lower slopes of the mountain, down to below 4000 feet, are covered with a shrub formation which appears to be an extension of the Juniper-Pinon Zone, or at least a transition between the Sierra Mixed Conifer Zone and the Juniper-Pinon Zone. On the open lava parks and the sandy areas at the base of the mountain the area is covered mostly with *Purshia tridentata* and *Cercocarpus ledifolius*. The former also grows in the chaparral on the southwest side of the mountain, especially near MacBride Springs, south of the lava parks. The latter also occurs as far up the mountain as the „Ghost Forest“ of the White Bark Pine zone near the upper end of one of the lava parks. At the lower edge of this area on the mountain occur occasional shrubs of *Artemisia tridentata*, occasional trees of *Juniperus californica* var. utahensis, and *Pinus ponderosa*, colonies of *Chrysothamnus nauseosus* var. occidentalis, and scattered shrubs or low trees of *Quercus chrysolepis*. The Juniper-Pinon Zone
extends north into the Shasta Valley at somewhat lower elevations and northeast along the base of Whaleback or Black Crater where the juniper occurs in fairly well developed woodlands.

**Host Index.**

The following list is not considered complete and further collections may add to the list of species of various fungi, and add to the lists of hosts on which fungi occur here. It consolidates previously published lists and notes (1, 2, 5, 6, 8, 9, 10, 13, 14, 15, 19, 24), and includes data from at least two other lists of collections made in California and the western states.

**ON TREES.**


Juniperus occidentalis. — Fulviformes juniperinus.


Pinus contorta var. latifolia. — Cronartium comptoniae.

Pinus lambertiana. — Armillaria mellea — Dasyscypha arida — Fomes officinalis — Lophodermium pinicolum.


Pinus ponderosa boards at Horse Camp (8000 ft.). — Acanthoneckchia coloradense — Acremonium verticillatum — Guepiniopsis alpina — Hysterium acuminatum var. alpinum — Tyromyces caesius.

Pseudotsuga taxifolia. — Cryptoporus volvatus.


ON SHRUBS AND SMALL TREES.

Acer glabrum. — Auricularia auricularis — Cryptosporella acerina — Lachnum bicolor — Massarinula lignorum — Septoria cirkinata — Septoria curvisporsa — Septoria marginata.

Aemeranchier pallida. — Gymnosporangium libocedri.


Artemisia fridentata. — Puccinia absinthii.

Berberis piperiana. — Cumminsella mirabilissima.

Castanopsis chrysophylla. — Dothidella janus — Godronia castanopsidis — Hymenochaete tabacina — Hypoxylon serpens — Lachnum bicolor — Taphrina castanopsidis.

Castanopsis sempervirens. — Rutstroemia sp.


Chrysothamnus nauseosus var. occidentalis. — Epochenium isthomorphum — Macrophoma chrysothamni — Puccinia gringeliae — Crategus douglasii. — Gymnosporangium libocedri.


Holodiscus discolor var. glabrescens. — Helotium ?virgulorum — Pyronella sirodesmoides.

Juniperus communis var. montanus. — Herpotrichia ?nigra — Lophodermia juniperina.

Kalmia polifolia. — Venturia kalmiae.

Phyllococe empetriformis. — Belonopsis sp. — Leciographa dispersa — Patinella abietina.

Polygonum shastense. — Ustilago shastense.

Populus tremuloides. — Melampsora albertensis.

Prunus demissa. — Dibotryon morbosum — Septoria pruni — Taphrina confusa.

Prunus emarginata. — Dasycypha succinea — Polyporus elegans — Taphrina flectens.

Prunus subcordata. — Taphrina pruni-subcordatae.

Quercus chrysolepis. — Corticum sp. — Dacrymyces deliquescens — Stereum hirsutum.

Rhamnus purshiana. — Cylindrosporium rhamni — Septoria variegata.

Rubus gymnocarpa. — Phragmidium rosae-californicae.

Rubus occidentalis. — Phragmidium occidentale.


Salix sitchensis.

Sambucus glauca. — Exosporium penduculatum.

Sambucus racemosus. — Brachysporium oosporum.

Sambucus nigricans.

Carex amplectens. — Puccinia caricis.

Carex bolanderi. — Phyllosticta caricis.

Carex brevifis. — Cladosporium herbarum — Mycosphaerella tasmaniana — Septoria lunelliana.

Carex breweri. — Phoma caricis — Phoma herbicola.

Carex fracta. — Cladosporium herbarum — Mycosphaerella tasmaniana — Septoria lunelliana.

Carex kelloggii. — Puccinia caricis.

Carex multicaulis. — Cintractia caricis — Mycosphaerella sepalorum — Puccinia atrofusca.

Carex nigricans. — Cintractia caricis.

Carex spectabilis. — Cintractia caricis — Cintractia externa — Leptosphaeria sp. — Pleospora eymae.

Carex whitneyi. — Puccinia caricis.

Carex spp. — Cladosporium herbarum — Hendersonia distans — Leptosphaeria vagans — Phiala sp. — Puccinia atrofusca.


Elymus glaucus var. jepsonii. — Puccinia glumarum.
Elymus hansenii (Sitania hansenii). — Puccinia glumarum — Puccinia pattersoniana — Scolecotrichum graminis — Selenophoma obtusa — Ustilago spegazzinii var. agrestis.

Glyceria elata. — Scolecotrichum graminis.

Holcus lanatus. — Puccinia rubigo-vera.


Juncus merriansia. — Pleospora elynae.

Juncus orthophyllus. — Leptosphaeria culmorum — Leptosphaeria juniceda — Leptosphaeria michottii — Typhula sp.


Juncus spp. — Cladosporium herbarum — Heteropatella umbilicata.

Luzula subcongesta. — Septoria minuta.

Melica californica. — Septoria nodorum.

Phleum alpinum. — Leptosphaeria typharum — Leptosphaeria vagans — Mycosphaerella tulasnei — Mycosphaerella sp.

Phleum sp. — Cladosporium herbarum.

Poa pratensis. — Arthrinium cuspidatum — Erysiphe graminis — Dendryphium sp. — Helminthosporium vagans — Puccinia poae-sudeikae.


**ON HERBS**

Agoseris gracilens. — Heteropatella umbilicata.

Agoseris grandiflora. — Puccinia hieraci.

Agoseris heterophylla. — Puccinia hieraci.

Agoseris scorzoneraefolia. — Puccinia hieraci.


Anaphalis margaritacea. — Uromyces amoennis.

Anemone occidentalis. — Clathrospora diplospora — Pleospora permunda — Scolebotium melanospermum — Urocystis sorosporioides.

Aquilegia formosa. — Puccinia rubigo-vera var. agropyri.

Arabis sp. — Puccinia monoica.

Arabis platysperma. — Microthyrium microscopicum — Pleospora permunda — Puccinia monoica — Sirexciptula wyomingensis — Sphaerotheca macularis.

Arabis platysperma var. howellii. — Micosphaerella tassiana.

Arnica longifolia ssp. myriadenia. — Apiosporella alpina.

Arnica mollis. — Sphaerotheca macularis var. fuliginea.
Arnica viscosa. — Hysteropezzella sp. — Lachnum setigerum
Leptosphaeria doliolum — Leptosphaeria heterospora — Phoma sp.
— Pleospora anthyllidis — Pleospora herbarum — Titaea sp. — Typhula sp.
Asarum hartwegii. — Puccinia asarina — Synchytrium asari.
Asclepias cornuta. — Cercospora clavata.
Aster occidentalis. — Puccinia extensicola var. asteris.
Aster shastensis. — Coleosporium solidaginis — Heterosphaeria sp. — Pleospora ambigua var. ambigua — Pyrenophora hispida — Septoria shastensis.

Bricellia grandiflora. — Puccinia subdecora.
Brunella vulgaris. — Linospora brunellae.
Calochortus nudus. — Puccinia calochortii.
Calyptridium umbellatum var. caudicifera. — Uromyces spragueae.
Cardamine bellidifolia var. pachyphylla. — Puccinia cruciferaevarum.
Castilleja arachnoidea var. shastensis. — Nectriella pedicularis — Phoma herbarum — Pleospora sp. — Sphaeropsis microspora.
Castilleja miniata. — Clathrospora diplospora — Heterosphaeria umbilicata — Typhula sp.
Castilleja penticorum. — Pleospora permunda — Pyrenophora fenestrata.
Chamaesarachaca nana. — Puccinia chamaesarchae.
Chimaphila umbellata. — Pucciniastrum pyrole.
Citrus occidentalis. — Puccinia cicutae.
Cirea pacifica. — Puccinia cireae.
Claytonia sibirica. — Ramularia claytoniae.
Clematis ligusticifolia. — Puccinia rubico-vera var. agropyri.
Commandra umbellata. — Puccinia commandae.
Cryptantha affinis. — Erysiphe cichoracearum.
Cycladenia humulis. — Pleospora permunda.
Cymopteris terebinthinus. — Puccinia jonesii var. cymopteri — Puccinia pseudocymopteri.
Delphinium pauciflorum. — Ramularia delphinii.
Dodonaceae sp. — Puccinia melanconioiudes.
Epilobiun adenocaulon. — Pucciniastrum pustulatum.
Epilobium angustifolium. — Pucciniastrum pustulatum.
Epilobium clavatum. — Puccinia scandica.
Epilobium hornemannii. — Sphaerotheca epilobii.
Epilobium lactiflorum. — Sphaerotheca epilobii.
Epilobium minutum. — Puccinia vagans.
Erigeron inornatus. — Erysiphe cichoracearum.
Eriogonum latifolium sp. nudum. — Uromyces intricatus.
Eriogonum pyrolefolium. — Cytospora eriogoni — Mollisia shastensis.
Eriogonum umbellatum sp. polyanthum. — Uromyces intricatus.
Eupatorium occidentale. — Pleospora herbarum.
Euphorbia crenulata. — Melampsora euphorbiae-gerardiana — Uromyces proeminens var. proeminens.
Euphorbia serpyllifolia. — Uromyces proeminens var. proeminens.
Fragaria californica. — Ramularia tulasi.
Fritillaria atrorupurea. — Phyllosticta fritillariae.
Gilia aggregata. — Heteropatella conglutinata.
Godetia quadrivulnera. — Heteropatella conglutinata.
Habenaria unalaschensis. — Aecidium graebnerianum.
Hieracium sp. — Puccinia sejuncta.
Hieracium albiflorum. — Puccinia hieracii.
Hieracium cynoglossoides var. nudicaule. — Entyloma compositarum — Sporobolomyces roseus.
Hieracium gracile. — Puccinia hieracii.
Hulsea nana. — Typhula sp.
Hypericum perforatum. — Uromyces hyperici.
Iliamna bakeri. — Phoma sp. — Pleospora herbarum — Selenophoma linicola.
Kelloggia galioides. — Phyllosticta crustosa.
Lathyrus lanzenvertii var. aridus. — Ascochyta pisi — Macroporum puccinoides — Septoria astragali — Uromyces fabae.
Ligusticum grayi. — Heteropatella umbilicata — Nyssopsora echinata — Pleospora permunda — Puccinia ligustici — Septoria aromaticum — Synchytrium aureum.
Lilium columbianum. — Uromyces holwayi.
Linum micranthum. — Melampsora lini.
Lotus torreyi. — Ovularia lotophaga.
Lupinus latifolius. — Uromyces occidentalis.
Madia gracilis. — Coleosporium madiae.
Mimulus tilingii. — Ramularia mimuli.
Mitella pentandra. — Puccinia heucherae.
Monardella odoratissima. — Phyllosticta monardellae — Placosphaeria shastensis — Pleospora diplospora — Pleospora permunda — Puccinia menthae — Stemphyllum sp.
Oxyria digyna. — Puccinia oxyriae.
Osmorhiza chilensis. — Puccinia pimpinellae.
Pedicularis densiflora. — Puccinia rufescens — Ramularia obducens.
Pentstemon deustus ssp. deustus. — Puccinia pentstenonis.
Pentstemon gracilentus. — Heteropatella umbilicata.
Pleospora permunda — Scelobelonium melanosporum.
Pentstemon menziesii var. davidsonii. — Dimerum alpinum — Puccinia palmeri.

ON FERNS

Athyrium americanum — Hysterium magnisporum — Typhula sp., Athyrium filix-foemina var. californicum — Uredinopsis copelandii, Cryptogramma acrostichoides — Typhula sp., Cystopteris fragilis — Hyalopsora polypodi, Pteridium aquilinum var. pubescens — Cryptomycina pteridis — Gloeosporium pteridis — Uredinopsis macrosperma.
ON FUNGI.

Acanthonitschkia coloradense. — Dasyacypha acantho-

Armillaria zelleri. — Diplocladium majus.

Fomes pinicola. — Hypocrea citrina.

Ganoderma oregonense. — Hypomyces aurantius.

Puccinia atrufusca. — Darluca filum.

Puccinia rubigo-vera. — Darluca filum.

On INSECTS.

Musca sp. — Entomophthora muscae.

ON CLOTH.

Cladosporium herbarum. — Stemphyllium consortiale.

ON ORGANIC DEBRIS NEAR SUMMIT.

Cladosporium herbarum. — Mucor sp. — Penicillium sp.

ON HUMUS, DUFF, LITTER.

Agaricus arvensis — Amanitopsis vaginata — Armillaria zelleri — Astrarus hygrometricus — Astarus ptetidis — Boletus albidus ssp. eupa-

chypus — Boletus frustosus — Boivista pila — Calodon amicue — Calvatia craniiformis — Calvatia fumosa — Calvatia sculpta — Calvatia subcre-
tacea — Calbovista subsculpta — Cantharellula umbonata — Claravaria con-
juncta — Claravaria obtusissima — Claravaria secunda — Claravaria sub-
decurrens — Clitocybe ssp. — Coltricia perennis — Coprinus comatus — Cortinariu

(near) aurifolius — Cortinarius cotoneus — Cortinarius heterosporus — Cortinarius orichalceus — Crucibulum laeve — Discina ancilis — Cyttarophyllum cucullata — Cyttarophyllum polytri-
choides — Geastrum coronatum — Helvella carliniana — Helvella carlo-

liniana — Hygrothorius glicyclus — Hygrophorus russula — Hygrophorus
vernalis — Laccaria sp. — Lamprospora leiocarpa — Longula texensis — Melanoleuca sp. — Montagnea arenarius — Mycena alcalina — Mycena

gracilis — Mycena griseoconica — Mycena griseoviride — Mycena laevi-
gata — Naucoria sp. — Naematoloma fasciculare — Omphalina rustica —

Caloscypha fulgens — Paxina nigrella — Pholiota trachyspora — Psathyrella
atrifolia — Psathyrella sp. — Rhodophyllus sp. — Russula delica — Sarco-

spheera amplissima — Secotium nubigenum — Secotium pingue — Stro-

pharia sienna — Tricholoma rhizoideum — Tulostoma tuberculatum —

Suillus sp. — Xerocomus miniato-olivaceus.

HYPOGAEOUS.

Abstoma reticulatum — Archangiella lactarioides — Archangiella

magna — Elasmosyces alpinus — Elasmosyces echinosporus — Endogene

lactiflua — Endogene sp. — Gautieria monticola — Gymnoglossum elas-
momyctoides — Hydnum aciculare — Hydnotrya vartiformis — Hymeno-
gaster remyi — Hymenogaster tener — Hysteraangium darkeri — Hysteran-
gium phillipsii — Hysterangium separabile — Melanogaster tuberiaformis

— Melanogaster variegatus — Pompholyx occidentalis — Rhizopogon brun-
nescens — Rhizopogon exiguus — Rhizopogon occidentalis — Rhizopogon

pnnosus — Rhizopogon provincialis — Rhizopogon rubescens — Rhizo-
pogon separabili — Sedecula pulvinata — Sclerodermia bovista — Scleroderma hypogaeum.

ON DUNG

Patella coprinaria — Rhyparobius monascus — Sordaria bombarioides — Sporormia australis.

ISOLATED FROM SOIL


Preliminary Isolations of Soil Fungi.

On Feb. 17, 1947, George Nyland, then in the Dept. of Plant Pathology, The State College of Washington, plated out in replicates of eight in 1:10,000 dilutions on malt agar five samples of soil collected on Mount Shasta in the summer of 1946. The writer made the subsequent examination of the plates and found the following fungi:

<table>
<thead>
<tr>
<th>Date</th>
<th>Source</th>
<th>pH of soil</th>
<th>No. of colonies</th>
<th>Fungi</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-21-46</td>
<td>Forest, 7000 ft.</td>
<td>5.5</td>
<td>2,250,000</td>
<td>Aspergillus fumigatus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coniothyrium fuckelii</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fusarium sp.</td>
</tr>
<tr>
<td>7-16-46</td>
<td>Sedge clumps 10,000 ft.</td>
<td>6.1</td>
<td>3,750,000</td>
<td>Mortierella pusilla</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium ?notatum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cladosporium herbarum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium spp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Streptomyces sp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Verticillium terrestre</td>
</tr>
<tr>
<td>8-26-46</td>
<td>Sedge Clumps 9,500 ft.</td>
<td>5.9</td>
<td>1,250,000</td>
<td>Penicillium ?notatum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium spp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Verticillium terrestre</td>
</tr>
<tr>
<td>8-26-46</td>
<td>Summit of Shasta 12,335 ft.</td>
<td>5.5</td>
<td>10,000,000</td>
<td>Mucor hiemalis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium ?notatum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium spp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Trichoderma viride</td>
</tr>
<tr>
<td>8-29-46</td>
<td>Heather meadow 7600 ft.</td>
<td>5.6</td>
<td>900,000</td>
<td>Aspergillus fumigatus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chaetomium succineum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Curvularia inaequalis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium ?notatum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Penicillium spp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Trichoderma viride</td>
</tr>
</tbody>
</table>

The number of colonies reported is the approximate number of colonies per gram air dry soil based on the average of eight plates.
pH was determined by a Beckman pH meter. The Curvularia was determined by J. Walton Groves, the Chaetomium by L. W. Ames, the Mortierella and Mucor by R. W. Emerson, and the other species by the writer. The following habitat notes are given:

1. In Shasta fir forest along the Horse Camp-Wagon Camp Trail under duff. The soil was associated with the roots of Allium tribracteatum. Shasta Fir Zone.

2. Isolated clumps of Carex breweri occur near the top of a ridge north of Horse Camp at the upper limits of the White Bark Pine zone. Soil was obtained from around one of these clumps.

3. In the basin at the head of Cascade Gulch between Shasta and Shastina there has been no meadow formed but occasional plants dot the area. Clumps of Carex breweri are scattered through this basin and around them is formed the closest approximation of a soil in the area.

4. Sand and gravel were obtained from the summit of Shastina. Evidently mold spores are deposited here by winds which continually blow over the mountain. The only growth in the area above 12,000 feet consists of crustose lichens on the rocks. Probably at this elevation frost occurs every night.

5. Panther Creek Meadows was described above. The tested sample came from the lower part of the middle meadow.

Explanation of Species List.

That part of the mountain in the southwest quadrant with its apices between Horse Camp at 8000 feet and the 10,000 foot level on the west bank of Mud Creek Canyon, and with its bases between Mount Shasta, McCloud and Mud Creek Dam, is the area which has been most intensively studied and collected. This will be evident throughout the following notes.

Notes are spotty on the mycological history of Mt. Shasta localities. This is because collections and notes were spotty on the basis that once a species was collected its presence in that locality was established and little more information was desirable. A study of Gilbert (18), however, has convinced the writer of the fallacy of this idea.

It will be noted that it was not possible to be in all localities of all stations in all zones in all of the eight summers the writer has spent at Horse Camp, nor was it possible to visit some localities more than once a year, if that often. However, such locations as the Sisson Southern Trail and the area through which it passes; and the Horse Camp-Wagon Camp Trail, Wagon Camp, Bear Springs, the Wagon Camp Road and McCloud Avenue, were visited frequently during the period he was on the mountain.
The frequency of observation of the species is partially indicated by collection numbers. This, then, is incomplete since over-abundant collecting would overburden the herbarium facilities of both the writer and his exchange correspondents. The frequency of occurrence of individuals is roughly indicated in only a few cases.

The dates of collection of the species are listed here in an attempt to partially establish the phenology of the species. Phenology will vary for each species as the dates of the season vary with the intensity of the snow pack. While complete phenologic data are available for certain individual collections not enough collections of a species are available over a period of time in the same season in the same locality for a complete presentation of this point for each species. The phenology of the species goes beyond the collection of merely mature material, but where available notes will be given.

Constancy of species is indicated only by the series of years listed under the dates of collection. These data are not complete since all species were not collected in all years although in many cases fruit bodies were present.

Data concerning abundance will be given with each species based on the following indices:

I. Very abundant.
II. Abundant.
III. Common.
IV. Rare.
V. Very rare.

These indices in roman numerals will be supplemented by a series of indices in letters. One or more combinations of the above numerals and the letters listed below will appear with each species.

A. On coniferous, woody, substrata.
B. On broadleaf, woody, substrata.
C. On herbaceous substrata.
D. On humus, duff or litter.
E. On animals and insects.
F. On other fungi.

If adventitious species exist on the mountain it is as a result of reaching the area with an adventitious host as in the case of *Albugo candida* on *Sisymbrium altissimum*. Wind blown spores, or spores carried by other means, may not necessarily produce adventitious species if a species can become established at a certain station. This observation, of course, is based on the hypothesis that all species adaptable to a certain set of environmental conditions can eventually be found in many, if not all, of the stations with these conditions. The presence of *Cladosporium herbarum* on fabric at the summit of the mountain, and of this species as well as at least one species each of *Penicillium*, *Mucor* and an unidentified fungus on a discarded
hamburger sandwich at the three mile post on the Summit Trail at 13,000 feet, may indicate the presence of adventitious species for it is not certain that these fungi survive throughout the year at these elevations where freezing temperatures probably occur throughout part of each day of the year.

Specific geographic distribution will be considered in connection with only a few of the species listed. Most distributions will be indicated in a general or an incomplete manner since Saccardo's Syllope Fungorum and most monographs consulted for this information list it in a general manner rather than in specific terms.

Further information is added for most species. At the suggestion of R. F. Daubenmire, the dominant vascular plants associated with the collections are listed.

Most of the collections cited prior to 1946 were made by the writer; most of those made between 1946 and 1950 by the writer and his wife, Vivian G. Cooke; and in 1951 by these two and their nephew Ronald E. Binegar. Collections made by others are noted where they have come to our attention through herbarium specimens or isolated literature reference. It is possible that additional collections not cited here may be found in herbaria not yet studied by the writer.

Specimens distributed in the writer's exsiccatum "Mycobiota of North America" will be indicated: "Exs. 1". This series is now distributed to twentyfive herbaria in North America, Europe and India.

In the case of molds of overwintering herbage, of certain grass leaf diseases and of certain wood inhabiting fungi, especially in the following genera, no record was kept in the writer's notebooks (1937—1941) of the determinations made. Thus no specific data on the frequency of occurrence, seasons and collections are presented for collections of these genera made prior to 1946. These genera include: Aposphaeria, Cladosporium, Dendryphium, Hendersonia, Heteropatella, Leptosphaeria, Lophium, Mycosphaerella, Oidium, Pellicularia, Phoma, Pleospora, Pyrenophora, Rhynchospora, Scelobelonium, Scolecotrichum, Schedonion, Septoria, Sphaerodium, Sphaeropsis, Stemphylium, Tilachlidium and Titaea. In the indicated years species of these genera were found in one or more of the indicated number of collections: 1937: 25; 1938: 12; 1939: 10; 1940: 17; 1941: 15.

A complete series of species (except hypogaeous ones) in many of the cited numbers is on file at the Herbarium of the University of California. Partial sets are filed at the Herbarium of the University of Cincinnati; the Mycological Collections, Bureau of Plant Industry, Beltsville, Maryland; the Herbarium of Oregon State College; the Farlow Herbarium, and the Herbarium of the New York Botanical Garden. All collections of Gasteromycetes examined by S. M. Zeiler prior
to his death are in his herbarium now at the New York Botanical Garden. Duplicates studied by various authorities are in the herbaria of the various institutions with which they are associated.


Special thanks are due to A. W. Slipp, School of Forestry, University of Idaho, and R. F. Daubenmire, Washington State College, for reading preliminary copies of the manuscript and for numerous suggestions and criticisms offered by them, many of which have been incorporated or followed in the final paper. The writer is also grateful to J. H. Miller, University of Georgia, for assistance in placing genera not included in the “Ascomycetes of Georgia” (21).

Bibliography.

I. Myxomycetes.

A report on 127 collections of 47 species has been published separately (Cook, p. 12).

II. Phycomycetes.

A. Oomycetes.

1. Chytridiales.

a) Syncytriales.


Saprolegniales.

Saprolegniaceae.

Saprolegnia sp. — At the Shasta Alpine Lodge the cooling system during 1936—1941 and in 1946 and 1947 consisted of a series...
of three tubs into the upper of which a continuous stream of water from the water supply spring was directed. The first tub, used for drinking and cooking, overflowed into the second, used for a cooler for submerged foods and floating vegetables, which in turn overflowed into the third, used for washing hands. This flowed into a small creek which runs for a couple of hundred feet before percolating and which irrigated about a hundred square feet of sod. In the second tub vegetables were kept fresh for from one to three weeks. After 6—10 days in cracks of tomato skins or over the surface of Italian squash, a saprolegniaceous fungus produced a luxuriant growth which, if allowed to grow for three weeks, would completely cover the concerned vegetable with a dense mass of white mycelium. No adequate way has been found as yet to get the fungus to a competent authority for identification. Possibly more than one species is involved. Probably this species, and others, could be obtained from similar situations in other mountainous regions.

*Peronosporales.*

*Albuginaceae.*

*Albugo candida* (Pers.) Roussel. — On *Sisymbrium altissimum.* — With the host following the Shasta Snowline Highway up to MacBride Springs, 4000—5000 feet. See Cooke (11).

Collections: 15507, 15600, 15652, 20085, Exs. 121. Dates: 11 June, 25, 31 July 1941; 27 June 1947; seen in other years. Abundance: III, C. Associates: *Arctostaphylos palaula, Ceanothus velutinus.* Distribution: On more than 70 cruciferous hosts in North and South America, Europe, Asia and Africa; Mt. Shasta.

*Peronosporaceae.*

*Peronospora grisea* (Ungh.) D. By. — On *Veronica alpina var. unalaschensis.* — Sierra Mixed Conifer Zone, Wagon Camp, 5700 ft.

Collection: 20327; Date: 18 July 1947; Abundance: V, C. Associates: *Mimulus, Epilobium, Veratrum, Allium, Habenaria.*

*Zygomycetes.*

*Mucorales.*

A number of molds attack foods kept for more than three or four days without frequent boiling. This occurs usually during the warm weeks in late July and in August. No attempt has been made to isolate and identify these.

*Mucoraceae.*

Mortierellaaceae.


Endogonaceae.


Entomophthorales.

Entomophthoraceae.

Entomophthora muscae (Cohn) Fres. — Found once, on dead flies on a window, Shasta Alpine Lodge, Horse Camp, 8000 ft. Collection: 7612; Date: 1 Sept. 1936; Abundance: V, E. Distribution: North America, Europe, Greenland.

Ascomycetes.

Hemiascomycetes.

Exoascales.

Exoasaceae.

Taphrina castanopsidis Ell. & Ev. ex Jenkins. — On Castanopsis chrysophylla. — Although the Sisson Southern Trail was in constant use by the writer from 1936 to 1941 this fungus was not observed during the intervening years. It was collected once in 1936 and was found to be abundant in 1941. Again in 1947 it was common around the base of the mountain. In the chaparral and on scattered shrubs up to 6000 feet.


Taphrina confusa (Atk.) Gies. — On Prunus demissa. — Scattered colonies of this deciduous shrub in the chaparral are occasionally infected by this fungus which causes witches brooms on which the leaves are curled. These brooms may produce healthy leaves in subsequent years. Shasta Snowline Highway and old snowline road, 4500 feet.

Taphrina fleclens Mix. — On Prunus emarginata. — On the mountain this species is occasional on locally abundant shrubs in the chaparral. It forms small to large witches brooms.


Taphrina potentillae (Farl.) Johans. — On Potentilla glandulosa ssp. nevadensis. — Near a spring and along a dry creek above Wagon Camp, Shasta Fir zone; MacBride Springs, Sierra Mixed Conifer zone. Infection mild but all leaves on a plant may be infected.


On Potentilla flabellifolia. — A few leaves on one plant infected, South Gate springs, 8250 feet, White Bark Pine zone.


Taphrina pruni-subcordalae (Zeller) Mix. — On Prunus subcordata. — Collected on shrubs along the old snowline road below MacBride Springs where a colony is occasionally attacked. In 1946 large witches brooms were formed on which all leaves were deformed. In 1947 there was no sign of diseased material on shoots from these brooms.


E usacomy cet es.

Plectomycetes.

E urotiales.

Eu rotiaceae.

Aspergillus fumigatus Fres. — Isolated from soil from Shasta Fir forest and from Panther Creek Meadows, Shasta Fir zone, 7000 and 7600 feet.

folia. Distribution: Europe, North and South America; Mt. Shasta.

**Penicillium** spp. (including *P. involutum*). — Isolated from the soils indicated in the table.

**Penicillium lanosum** Westling. — Isolated from soil collected at Wagon Camp in 1948.

**Penicillium raciborskii** Zaleski. — Isolated from soil collected at Wagon Camp in 1948.

**Erysiphales.**


On *Vicia americana.* — Usually common in dryer portions of Wagon Camp Meadows and MacBride Springs areas.


*Sphaerotheca epilobii* (Lk.) Duby. — Common on plants around springs. Wagon Camp and Sisson Southern Trail Springs.


On *Epilobium lactiflorum.* — Covering a host colony near a spring along Squaw Valley Creek, 8000 ft.


*Sphaerotheca macularis* (Wallr. ex Fr.) W. B. Cke. — On *Viola purpurea.* — A large host colony along trail above Wagon Camp was heavily infected.


*Sphaerotheca macularis* var. *fuliginea* (Schlecht. ex Fr.) W. B. Cke. — On *Arnica mollis.* — While the host is common at Panther Creek and Squaw Valley Creek meadows infection has been observed only at the latter location.


On *Taraxacum officinale.* — Observed on only several plants at Wagon Camp.


**Perisporiaceae.**

*Dimerium alpinum* W. B. Cke. — On *Pentstemon menziesii* var. *davidsonii.*

The host normally inhabits exposed places in the timberline region and in the White Bark Pine zone where it finds shelter on the moist side of rocks and moisture near seepage areas. While it occurs in other locations of a more exposed nature, in this type of location whole colonies become blackened with the fungus. These habitats are subject to prolonged periods of cover by the annual snow pack. At these times the relative humidity is very high although the
temperatures are low. These conditions are reversed in the summer with the high insolation characteristic of higher elevations with little or no shade from forest cover. Observed throughout the southwest quadrant between 8500 and 9500 feet.


Pyrenomycetes.
Sphaeriales.

Sordariaceae.

Sordaria bombarioides Awd. — On horse dung.

A specimen collected by Harkness at Mt. Shasta, Calif., was cited by Griffiths in "North American Sordariaceae", Mem. Torr. Bot. Cl. 11: 43. 1901. This must have been obtained on the mountain for the name of the community at its base was not changed from Sisson's to Mount Shasta until 1925.

On deer dung. — Shasta Fir woods on ridge between Horse Camp and Panther Creek Meadows.


Sporormia australis Speg. — On deer dung. — Shasta fir forest on ridge between Horse Camp and Panther Creek Meadows.


Chaetomiaceae.

Chaetomium murorum Corda. — Isolated by G. W. Martin from piece of wood of Shasta fir sent for study of Myxomycete plasmodium. Horse Camp, 8000 ft.


Chaetomium succineum Ames and Chaetomium sp. — Isolated from soil from Panther Creek Meadows.


Diaporthaceae.

Cryptosporell a acerina L. E. Wehmeyer. — On Acer glabrum. — A few branches of shrubs below the Sisson Southern Trail Spring were infected.

Collection: 20413 (type). Date: 8 Aug. 1947. Abundance: IV, B. Associates: Abies concolor, Abies magnifica var. shastensis, Pinus pon-
Xylariaceae.

Associates: *Abies concolor*. Distribution: Tyrol, Austria; Mt. Shasta.

**Hypoxylon serpens** Pers. ex Fr. — On *Ceanothus velutinus*. — Common on dead branches wherever the host is smothered out by young colonies of *Abies concolor* and *Pinus ponderosa*. 
Collections: 18100, Exs. 211. Date: 28 June 1946. Abundance: III, B. 
Associates: *Abies concolor*, *Pinus ponderosa*. Distribution: Europe, Siberia, Borneo, North and South America; Mt. Shasta.

**Rosellinia riminicola** Rehm. — On *Haplopappus bloomeri* var. angustatus. — Common on dead branches in the Horse Camp area, 8000 ft. 

**Rosellinia subsimilis** Sacc. — On *Arctostaphylos nevadensis*. — Occasional branches carry fruit bodies, Horse Camp, 8000 ft. 
Collection: 18184. Date: 8 July 1946. Abundance: IV, B. 
Associates: *Abies magnifica* var. *shastensis*.

On *Arctostaphylos patula*. — Covering dead branches in the chaparral along the lower end of the Sisson Southern Trail, 4500 ft. 
Collection: 19296, Exs. 256. Date: 7 April 1947. Abundance: IV, B. 

Hypocreales.

**Hypomyces aurantius** (Pers.) Fckl. — On *Ganoderma oregonense*. — Large conks of the host fungus have been found in the season following their emergence in somewhat disintegrated condition. The hymenial surface of some of these conks was covered with this disease. Beetles which eat the *Ganoderma* seem to leave the *Hypomyces* to some other agent of decay. 
Associates: *Abies magnifica* var. *shastensis*. Distribution: Europe, Cuba, North America; Mt. Shasta.

Specimens of *Spongiporus leucospongia* collected on an old White Bark Pine sign post high above timberline along the Summit Trail had turned a color characteristic of the early stages of this
fungus. However, it had not fruited and no attempt was made to
culture it.

*Hypocrea citrina* (Pers.) Fr. — On *Fomes pinicola*. —
Occasional conks of the host occurring on Shasta fir are infected
with small colonies of this fungus. Panther Creek Meadows, 7600 ft.
Collection: 28258. Date: 1 July 1951. Abundance: V, F. Associates:
*Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution:
Ceylon, Tasmania, Europe, North America; Mt. Shasta.

**Lophiostomatales.**

*Lophiostoma brenckleanum* Sacc. — On *Haplopappus
bloomeri* var. *angustatus*. — Found once at Horse Camp, 8000 ft.
Collection: 18181. Date: 8 July 1946. Abundance: V, B. Associates:
*Abies magnifica* var. *shastensis*. Distribution: North Dakota; Mt.
Shasta.

**Microthyriaceae.**

*Microthyrium microscopicum* Desm. — On *Arabis
platysperma*. — On dead stems of previous year, south side of Red
Butte, 8000 ft.
*Tsuga mertensiana, Abies magnifica* var. *shastensis*. Distribution;
New Zealand, Europe, North America; Mt. Shasta.

**Dothideales.**

*Dothidella janus* (Berk. & Curt.) Hoehn. — On *Castanopsis
chrysophylla*. — Occasional throughout the range of the host, but
occasionally abundant on single branches or on a colony of shrubs.
Collections: 8510, 10141, 10236, 16635, Exs. 28, 28, 28—A, 25698. Dates:
Abundance: I, B. Associates: *Arctostaphylos patula, Ceanothus velutinus*.
Distribution: California, Oregon, Washington, New Mexico,
Texas, Florida, Mt. Shasta.

*Dothidella junce* (Fr.) Sacc. — On *Juncus parryi*. —
Ascostromata found on most of the culms of occasional clumps in
the vicinity of Horse Camp.
Collections: 10303, 18032, Exs. 40—A. Dates: 17 Sept. 1938, 24 June
1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*.
Distribution: Europe, California; Mt. Shasta.

*Dothidella trifolii* (Pers. ex Fr.) Bayl.-Ell. & Stan. —
On *Trifolium involucratum* var. *fimbriatum*. — The imperfect stage,
*Polythrincium trifolii*, was found once on the host which is wide-
spread in Bear Springs meadow.


**Mycosphaerellaceae.**


On *Arabis platysperma.* — On overwintered stems, Sisson Southern Trail, 7000 ft.


On *Carex frcta.* — With *Cladosporium herbarum* on overwintered leaves, MacBride Springs.


On *Phleum alpinum.* — On overwintered herbage around springs above Panther Creek Meadows.


On *Senecio triangularis.* — On overwintered herbage, lower Panther Creek Meadows.


On *Veratrum californicum.* — On overwintered stems along lower Panther Creek.

Distribution: Europe, North America, Mt. Shasta.

**Mycosphaerella** sp. — On *Pinus albicaulis*. — On cone scales on ridge above Horse Camp, 9000 feet.
Collection: 18254. Date: 16 July 1946. Abundance: V, A.

**Pseudosphaeriales.**

**Pseudosphaeriaceae.**

**Acanthonitschkia coloradense** Cash & Davidson. — On *Abies magnifica* var. *shastensis*. — On *Pinus ponderosa* boards. — Found on both substrata in the Horse Camp area, 8000 ft. Fir branches on which this grew were recent falls. The unpainted boards had been in use for about 8 years.

**Apiosporella alpina** Wehm. — On *Arnica longifolia* ssp. *myriadenia*. — Lower end of the Panther Creek meadow area, 6500 ft.

**Apiosporella mimuli** Wehm. — On *Allium validum*. — Lower portion of Panther Creek Meadows, 7000 ft.

**Apiosporella** sp. — On *Lupinus albicaulis* var. *shastensis*. — Common on overwintered herbage, Horse Camp-Wagon Camp Trail, 7000 ft.

**Bertia moriformis** (Tode ex Fr.) de Not. — On *Abies magnifica* var. *shastensis*. — On exfoliating bark of dead branches, Sisson Southern Trail, 7500 ft.

**Dibotryon morbosum** (Lib.) Theiss. & Syd. — On *Prunus demissa*. — Only one colony has been observed to be infected, in the chaparral, old snowline road, 4500 ft.

**Clathrospora cookii** Wehmeyer. — On *Stipa californica*. — On overwintered culms and leaves, Horse Camp.

*Clathrospora diplospora* (Ell. & Ev.) Wehm. — On *Anemone occidentalis, Castilleja miniata, Monardella odoratissima.* — Scattered through the White Bark Pine zone above 8500 ft. above the basin of Panther Creek Meadows, and around Horse Camp at 8000 ft. in the Shasta Fir zone.


*Gibbera* sp. — On *Abies magnifica* var. *shastensis.* — On branches near Horse Camp associated with a pink mold.


*Herpotrichia nigr a* Hart. — On *Abies concolor, Abies magnifica* var. *shastensis, Juniperus communis var. montanus, Tsuga mertensiana.*

This fungus commonly occurs on young trees of Shasta fir and mountain hemlock where those threes grow outside of or above the taller timber, in such places as at the edge of economic timberline and avalanche areas which are becoming reseeded. It is a "smothering" fungus and as such is of economic importance since it kills the branches on which it grows. It also occurs on needles in the Shasta fir litter. It has also been found enveloping branches of the shrub juniper which lie near the ground on outcroppings in the White Bark Pine zone. In occasional pockets on lava slopes in the Squaw Valley Creek area occasional trees of White Fir are heavily attacked; Sierra Mixed Conifer zone. Its habitat is in the region of heaviest and longest snow packs.


*Lasiosphaeria vermicularia* (Nees) Cke. — Collected once in 1937 on Shasta fir slash, Horse Camp.

Abundance: V, A. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Carolina, California, Mt. Shasta.

*Leptosphaeria dolio l um* (Pers.) Cel. & de Not. — On *Arnica visc osa.* — Found once at Horse Camp, 8000 ft.

*Leptosphaeria heterospora* (Not.) Niessl. — On *Arnica viscosa*, *Poa epilis*, *Stipa occidentalis*, *Trisetum spicatum*. — On overwintered herbage in the Horse Camp basin area between 8000 and 9500 feet.


Abundance: V, C. Associates: *Mimulus tilingii*, *Juncus mertensianus*. Distribution: On one each of a grass, sedge and rush, Europe; Mt. Shasta.

*Leptosphaeria microscopica* Karst. — On *Agrostis thurberiana*, *Trisetum spicatum*. — In the Horse Camp area, 8000—8250 ft.


*Leptosphaeria millefolii* Fckl. — On *Lupinus obtusilobus*. — Forming blackened areas over entire stems and plants in the Horse Camp area, 8000 ft. During the first year of growth of this fungus it remains sterile on the living host.


Collection: 18007. Date: 21 June 1946. Abundance: IV, C. Associate: *Abies magnifica* var. *shastensis*. Distribution: Germany, Switzerland, Finland; Mt. Shasta.

*Leptosphaeria typharum* (Desm.) Karst. — On *Phleum alpinum*. — On overwintered culms and leaves at a small spring above Panther Creek meadows, 8500 feet.

Leptosphaeria vagans Karst. — (L. caricinella Karst.; L. junciseda Karst.) — On Agrostis sp., Carex sp., Juncus balticus var. montanus, Juncus orthophyllus, Phleum alpinum, Trisetum spicatum. — On overwintered herbage in spring areas in the upper Shasta fir zone, timberline areas and White Bark Pine zone.


Melomastia shastensis Earle. — On Abies magnifica var. shastensis. — Collected by E. B. Copeland on Shasta fir in 1904. Only published record found occurs in Bull. N. Y. Bot. Gard. 1904: 292. Apparently this was collected in the vicinity of Horse Camp, or at some point along the route of the Sisson Southern Trail in the Shasta Fir zone.


Metasphaeria sepalorum Vleugel. — On Juncus parryi, Carex multicaulis. — In contrast to most species in this group this species develops in a stroma-like structure usually on the perianth segments but also occasionally on the peduncles and scapes.


Neopeckia coulteri (Pk.) Sacc. — On Pinus albicaulis.

This "smothering fungus" occurs only on white bark pine on Mt. Shasta. It is fairly common and looks as if some tent caterpillar had formed a dense brown web on the infected branch of the infected tree. Its occurrence is scattered and nowhere can the death of individuals over large areas (as in the case of the "ghost forest" caused by Arceuthobium campylopodum f. cyanocarpum on the same host) rather than just twigs or branches, be attributed to the smothering action of this fungus.


Linospora brunnellae Ell. & Ev. — On Prunella vulgaris.


On overwintered herbage from 4500 ft. in the chaparral along the Sisson Southern Trail and above Hotlum Station, to the Horse Camp.
area at 8000 ft. Abundance: II, C. Distribution: On at least 15 monocot and dicot herbs; Europe, Siberia, Java, New Zealand, America, Pan-arctic, Mt. Shasta.


*Pleospora* spp. — On *Aster shastensis*, *Castilleja arachnoidea* var. *shastensis*, *Juncus mertensianus*, *Lupinus albicaulis* var. *shastensis*, *Veratrum californicum*. On overwintered herbage in most locations on the mountain as yet unidentified species of *Leptosphaeria* and *Pleospora* seem to be quite common. Abundance: II, C.


**Trichosphaeria solaris** (Cke. & Ell.) Ell. & Ev. — On *Abies magnifica* var. *shastensis.*

**Venturia halmiae** Peck. — On *Kalmia polifolia.* — In the heather meadows at Panther Creek Meadows.

**Note:** A number of species of ascomycetous fungi develop perfect stages on dead herbaceous material. Usually the herbaceous material can be assigned to the plant which produced it. Following the frosts at the end of August or in early September the host part dies and is soaked by the rains, the water melting from hail storms, sleet or snow cover. The dead or dying host parts, which were perfectly healthy and without sign of fungus infection prior to the frosts, thus become thoroughly water soaked and, when not frozen, present excellent habitats for fungi. From November to June, in normal years, these plant parts are covered by the snow pack, although snowfall starts as early as September as low as 8000 feet, the elevation of these observations. During the period of the pack the plant remains under it are probably well watered and evidently well insulated against freezing; a very high relative humidity is probably characteristic of such habitats. Within two weeks after the pack has melted the herbage has become thoroughly dry and brittle. Thus these mature fungi, with which are associated imperfect species, which may or may not be their imperfect stages, probably developed under the snow pack.

**Hysteriales.**

**Hysteriaceae.**

**Gloniella lapponica** Karst. — On *Arctostaphylos nevadensis.* — On dead branches and twigs near the upper limits of the range of the host in the Horse Camp area.

**Hysterium acuminatum** Fr. var. *alpinum* Rehm. — Collected on wood of *Abies magnifica* var. *shastensis,* on bark of *Tsuga mertensiana* and on boards of *Pinus ponderosa,* Horse Camp area and Panther Creek Meadows, 7600—8000 ft.
Hysterium magnosporum Ger. — On Athyrium americanum. — Although it was looked for at intervening periods this species has been collected only in 1937 and 1946 on overwintered stalks in Horse Camp Creek where a large host colony occurs.


Hystergaphium formosum (Cke.) Sacc. — Collected on white bark pine and Shasta fir twigs which were dead and which were either still on the tree or had just fallen to the ground. The fungus fruited on the bark. Around the flat below Horse Camp, 8000 ft.


Lophium dolabiforme Wallr. — On Juncus balticus var. montanus. — A few hysterothecia were found to be scattered among other fungi on overwintered culms at Horse Camp.

Abundance: V, C. Distribution: Germany, Switzerland, Mt. Shasta.

Discomycetes.
Helotiales.

Hysteropezizella spp. — Possibly two species occur on overwintered herbage, one on Lupinus obtusilobus, the other on Arnica viscosa. — Abundance: IV, C.

Laetinaevia veratri Gash. — On Veratrum californicum. On overwintered herbage and stems in wet places at Wagon Camp, 5700 ft.


Tympanis pithya (Karst.) Karst. — On Pinus albicaulis. — Found in the Horse Camp area on bark of twigs following the winter's snow pack.


Phacidiaeae.

Bifusella acuminata (Ell. & Ev.) Bonar & W. B. Cke. — On Juncus parryi. — The culms of many clumps of this host are commonly found covered with this fungus after the melting of the snow
pack. Collections have been made throughout the timberline region on the southwest side of the mountain.


**Clithris crispa** (Pers.) Rehm. — On Abies magnifica var. shastensis. — This species is found on dead Shasta fir wood either as small black slits on the wood when dry or as grey cups when moistened by melting snow. It is also found on blackened areas on old wood throughout the range of the host.

On *Tsuga mertensiana* (Bong.) Sarg. — Found once on wood south of Red Butte at 7500 feet.


**Cryptomyccina pteridis** (Rebent. ex Fr.) v. Hoehn. — On *Pteridium aquilinum* var. pubescens. — Found only once and then with Ramularia pteridis at Wagon Camp in fir woods near the meadows, 5700 ft.


**Elytroderma deformans** (Weir) Darker. — On *Pinus ponderosa*. — A specimen was reported by W. D. Wagener in the Forest Pathology Herbarium in the San Francisco field office (97725), collected by K. A. Sal m a n, 2 June 1934 at Stevens Pass, Tennant, Siskiyou Co., Calif. In the herbarium of J. S. Boyce are specimens from Goosenest Mountain and Pilgrim Creek Nursery, Siskiyou Co., California.

On *Pinus jeffreyi*. — A specimen was reported by G. D. D a r k e r in the herbarium of the office of Forest Pathology, San Francisco, collected by E. P. M e i n c k e, Sh. D. 4, from Sisson Tavern Park, “Shasta Co.” (now Mount Shasta, Siskiyou Co.), Calif.

**Hypoderma labietinum** Ell. & E. — On Shasta fir bark at Horse Camp, 8000 ft.


**Hypoderma robustum** Tub. — On Abies concolor. — The most common needle cast found on the mountain. The needles on a number of branches of several trees on the lava flow terminating at MacBride Springs, and along the Sisson Southern Trail just south of the flow, were infected.


_Hypoderma _ella _abietis-concoloris _(Mayr) _Dearness._ On _Abies _concolor._ — According to Darker (16) material collected “near Mt. Shasta, Cal.” prior to 1896 was the basis of this species.

_Hypoderma _ella _medusa _Dearness._ — On _Pinus _ponderosa._ — Darker (16) reports a specimen (SH. D. 3) in the herbarium of the San Francisco office of Forest Pathology from near Antelope Ranger Station, Siskiyou Co., Calif.


_Lophoderium _phloxii _Bonar _& _W. _B. _Cke._ — On _Phlox _douglasii._ — Found in two seasons and then covering a number of plants in a large colony on a flat below the Lodge at Horse Camp and on several plants on gravel slopes above the Lodge. In a previous year _Macrophoma _cylindrospora _(Desm.) _Berl. _& _Vogl._ was common in the same area and might be the imperfect stage although no cultures were attempted. The latter appeared to be parasitizing healthy plants.
while the former was found on dead branches and leaves on dead plants.


Distribution: _Macrophoma_: Europe, Mt. Shasta; _Lophodermium_: Known only from Mt. Shasta.

_Lophodermium piceae_ (Fckl.) v. Hoehn. — On _Abies magnifica_ var. _shastensis_. — On needles on trees between Panther Creek Meadows and Wagon Camp, 7000 feet.


_Lophodermium piniolum_ Tehon. — On _Pinus lambertiana, Pinus ponderosa_. — Common on fallen branches along the Sisson Southern Trail between 5000 and 5500 feet.


_Odontotrema minus_ Nyl. — Forming areas of black spots on silvered, weathered, unpainted, hand-hewn boards of Shasta fir in Horse Camp installations.


**Orbiliaceae.**

_Orbilia coccinella_ (Som.) Karst. — On _Purshia tridentata_.

— North side of Mount Shasta about a mile north of Andesite Station, 5000 feet.


**Patellariaceae.**

_Leciographa dispersa_ Syd. — On _Phylloclade empetriformis_. — Found once at the water supply spring above Horse Camp.


_Trybidiella macrospora_ Bonar & Cash. — On _Libocedrus decurrens_. — Found once on branches at Bear Springs, 5000 ft.

Hyaloscyphaceae.

_Hyaloscypha atomaria_ (Starb.) Nannf. — On Shasta fir logs at Horse Camp, 8000 feet. Observed only when the wood was still wet from melting snow.


*Lachnum bicolor* (Bull. ex Fr.) Karst. — On _Acer glabrum, Castanopsis chrysophylla, Ceanothus velutinus_. — Found on dead twigs and branches of these shrubs lying partially buried in litter at the base of the plants.


*Lachnum setigerum* (Phil.) Lindau. — On _Arnica viscosa_. — On the bases of stems of the host after overwintering under snow packs, especially where a large number of such herbaceous stems occur together.


_Helotiaceae._

_Belonioscypha campanula* (Fr.) Rehm. — On _Eriogonum marifolium_. — On several plants at 8100 ft. Following the snow pack small, pink, immature, later large, brown, mature fruit bodies found on overwintered peduncles.


_Cenangium_ sp. — On _Abies magnifica_ var. _shastensis_. — On dead branches along the Sisson Southern Trail at 7500 ft.

Collections :18350, 18355. Date: 10 Aug. 1936. Abundance: IV, A. Associate: _Abies magnifica_ var. _shastensis_.

_Ciboria rufo-fusca* (Web.) Sacc. — On _Abies magnifica_ var. _shastensis_. — On cone scales in litter at Horse Camp.


_Dasyascus aacanthonischkia* Cash & Davidson. — On _Acanthonitschkia coloradensis_. — Occasional on ponderosa pine boards used in construction of unpainted cabins at Horse Camp, 8000 ft. Boards were in use 8 years.

Dasyscypha agarizzii (Berk. & Curt.) Sacc. — On Abies magnifica var. shastensis, Pinus albicaulis, Tsuga mertensiana. — Occasional on wood throughout the Shasta Fir and Withe Bark Pine zones.


Dasyscypha aploppapi Cash. — On Haplopappus bloomeri var. angustatus. — Common on dead branches of this small shrub after the snow melts in June at Horse Camp.


Dasyscypha arida (Phil.) Sacc. — On Abies magnifica var. shastensis. — This is the commonest discomycete in the Horse Camp area. It does not form cankers but it does fruit on living stunted Shasta firs at the upper limits of the main forest of the Shasta Fir zone. In these places it fruits abundantly on parts of trees injured by the snow pack in which cases it may complete the destruction of the infected parts. It also occurs on parts of trees injured by avalanches.

Collections: 7582, 7600, 7639, 8515, 8523, 8524, 8534, 8540, 8548, 8549, 8550, 8551, 13311, 13316, 15595, 15645, 18042, 18351, Exs. 67. Dates: 9, 25 Aug., 10 Sept. 1936; 19, 22, 29 June 1937; 5 July 1939; 23, 29 July 1941; 24 June, 10 Aug. 1946. General: Observed throughout the season from 10 June through 15 September, especially whenever fruit bodies are revived by rain or melting snow, in every year from 1936 through 1948 and on the occasional visits since. Abundance: I, A. Associates: Pinus albicaulis, Tsuga mertensiana.

On Pinus albicaulis.


On Pinus lambertiana.


On Abies concolor.


On Tsuga mertensiana.

Dasyscypha flammea (Alb. & Schw.) Fr. — On Cerco- 
carpus ledifolius. — On dead branches near Andesite Station at 
5000 ft. at the north base of the mountain. 
Arctostaphylos patula, Ceanothus velutinus. 

On Haplopappus bloomeri var. angustatus. — On dead branches 
in the timberline area above Horse Camp. 
Collection: 15596-A. Date: 18 July 1941. Abundance: V, B. Associates: 
Eriogonum marifolium, Polygonum shastense. Distribution: Europe, 
Iceland, Ceylon, North America, Mt. Shasta.

Dasyscypha nivea Sacc. — On Arctostaphylos patula. — 
Found once on partially buried sticks along the Junction road in a 
tongue of chaparral extending up to the lower part of the Shasta Fir 
zone. 
Collection: 15723. Date: 18 Aug. 1941. Abundance: V, B. Associates: 
Ceanothus velutinus, Castanopsis chrysophylla. Distribution: Europe, 
North America, Mt. Shasta.

Dasyscypha phlogis Cash. — On Phlox douglasii. — On 
dead branches on plants on west side of Shastina, 6000 ft. and below 
Horse Camp, 7750 ft. 
Collection: 20484 (Type). Date: 27, 28 Aug. 1947. Abundance: V, B. 
Associates: Pinus albicaulis, Abies magnifica var. shastensis. Distribu-
tion: Known only from these collections.

Dasyscypha salmonea Cash. — On Haplopappus bloo-
meri var. angustatus. — Common on dead branches of this small 
shrub after the snow melts in June at Horse Camp. 
Collections: 18081, 18174, 18179 (type), 27015. Dates: 27 June, 7, 8 July 
var. shastensis. Distribution: Known only from these collections.

Dasyscypha serinella (Quel.) Sacc. — In a handful of 
litter from under a mountain hemlock tree in Panther Creek meadows 
in which the largest percentage of organic matter was hemlock 
needles, 586 needles had at least one fruit body each of this species; 
some needles carried as many as four or five cups. Litter of Shasta 
fir needles at Horse Camp and white bark pine at 9000 feet on ridges 
above Horse Camp also carried small yellow cups of this species. 
Collections: on Tsuga mertensiana: 15698, 28324; on Abies magnifica 
var. shastensis: 18045; on Pinus albicaulis: 18259. Dates: 28 July 1941; 
25 June, 16 July 1946; 3 July 1951. Abundance III, A; IV, A; IV, A. 

Dasyscypha succinea (Phill.) Sacc. — On Ceanothus 
velutinus, Prunus emarginata. — Collected on the former host along 
the Junction Road on branches partially buried in litter, and on 
branches in the chaparral at McCloud Summit on State Route 89. Also
on the latter host on a root disloged in a road widening operation at Bear Springs.


*Durella* (?compressa) (Pers. ex Fr.) Tul.]. — On dead wood of Shasta fir along the Sisson Southern Trail at about 7000 ft.


*Godronia castanopsidis* Seaver. — On *Castanopsis chrysophylla*. — Following a light rain a quantity of material of this species was obtained from dead branches in the chapparal along the Junction Road between Wagon Camp and the Snowline Highway. When dry this species is inconspicuous, when moistened its receptacles are bright yellow. Earlier, in connection with a collection of grass, a fragment of a branch of *Arctostaphylos patula* Greene was found with several fruit bodies.


*Helotium virgulorum* Vahl. ex Fr. — On *Holodiscus discolor* var. glabrescens.


*Helotium* sp. — On *Castanopsis sempervirens*. — On dead branches under shrubs on ridges north of Horse Camp at about 8500 ft. Immature.


*Lachnellula chrysophthalma* (Pers. ex Fr.) Karst. — Collected on hand hewn boards of Shasta fir at Horse Camp, and on old withe bark pine wood near Horse Camp.


*Mollisia hysterioides* Cash. — On *Haplopappus bloomeri* var. *angustatus*, *Phlox douglasii*. — Occasional on dead branches of these small shrubs on open flats around Horse Camp, 8000 ft.

Mollisia shastensis Cash. — On Eriogonum pyrolaefolium.
— Stems of this host develop underground and on death of the host
become exposed. The plant grows in Alpine zone locations and few
fungi have been found on it. North Ridges, 9000 ft.
undance: V, C. Associates: Agoseris monticola, Hulsea nana.

On Arctostaphylos nevadensis. — On branches of shrubs between
Horse Camp and Panther Creek Meadows.
Collection: 20456. Date: 15 Aug. 1947. Abundance: V, B. Associate:
Abies magnifica var. shastensis. Distribution: Known only from these
collections.

On Eriogonum marifolium. — South side of Red Butte, 8000 ft.
Collection: 25614. Date: 24 Aug. 1949. Abundance: V, C. Associates:
Abies magnifica var. shastensis, Tsuga mertensiana.

Patellea californica Rehm. — On Arctostaphylos patula,
Salix scouleriana. — On dead branches in a tongue of chaparral in
the lower Shasta Fir zone, 6000 ft., intersected by the Junction Road;
and along the old Sisson Southern Trail, 4500 ft.
V, B. Associates: Ceanothus velutinus, Castanopsis chrysophylla.
Distribution: California, Mt. Shasta.

Patellea umbrorum (Fr.) Seaver. — On rotten conifer
wood at Wagon Camp.
Abies concolor, Abies magnifica var. shastensis. Distribution: Europe,
North and South America, Mt. Shasta.

Patinella abietina (Cke.) Sacc. — On Abies magnifica
var. shastensis. — On dead branches at Horse Camp, 8000 ft.
Collection: 18225. Date: 10 July 1946. Abundance: V, A. Associate:
Abies magnifica var. shastensis.

On Phylodoce empetriformis. — On dead branches along Cause-
way below Horse Camp Springs, 8100 ft.
IV, B. Associates: Eriogonum marifolium, Polygonum shastense.
Distribution: California, Mt. Shasta.

Patinella atroviridis Rehm. — On Pinus albicaulis.
— A large dry branch of the host found at 9000 ft. in the White Bark
Pine zone on ridges north of Horse Camp was covered with this
species.

Pezizella helotioides Starb. — On Allium vallidum. —
On overwintered leaves in a spring area above Wagon Camp, 5800 ft.
Collection: 18008-A. Date: 21 June 1946. Abundance: V, C. Associates:
Abies magnifica var. shastensis, Arnica mollis. Distribution: Sweden, Mt. Stasa.

Phialea sp. — A number of small brown cups were collected on leaves of a species of Carex from around the base of a clump along the Horse Camp-Wagon Camp Trail at about 7000 ft. Collection: 15740. Date: 18 Aug. 1941. Abundance: V, C. Associate: Abies magnifica var. shastensis.


Sclerotinia sp. — Two small specimens were obtained in the heather meadows at Panther Creek meadows at about 7500 ft. Collection: 15625. Date: 28 July 1941. Abundance: V, D. Associates: Phyllodoce empetriformis, Kalmia polifolia, Vaccinium caespitosum. Tapesia fusca (Pers. ex Fr.) Fckl. — On Ceanothus velutinus. — On twigs of the host partially buried under undisturbed debris along the Junction road.


**Trichoscyphaella tenuipilosa** Cash. — On *Abies magnifica* var. *shastensis*. — South side of Red Butte, 7500 ft.

Pezizales.

**Discina ancilis** (Pers.) Sacc. — On the soil near Shasta fir logs, on soil around various buildings at Horse Camp, 8000 ft., on soil under ponderosa pines at 5500 ft. Specimens on various kinds of coniferous litter and duff have been collected from between 5000 and 8000 ft. In 1946 material was collected on sawdust, and on burned and unburned soil under a woodpile.

**Geopyxis cupularis** (L.) Sacc. — On rotten wood near Wagon Camp, 5700 ft.

**Geopyxis vulcanalis** (Pk.) Sacc. — One colony was found on fir duff along the Sisson Southern Trail, 6500 feet.

**Humaria scutellata** (L. ex Fr.) Fckl. — Small colonies of this red cup were found on a Shasta fir log in the Sisson Southern Trail spring and in a creek at Wagon Camp; on an incense cedar log in a small creek between Bear Springs and Wagon Camp; and on an overwintered prostrate stem of *Veratrum californicum* in Panther Creek Meadows, 5000—7500 feet.

**Lamproderma leiocarpa** (Carr.) Seaver. — Around burned ground in camp fire areas along the Sierra Lodge Ski Trail in Shasta fir woods at about 7250 feet.
**Caloscypha fulgens** Boud. — This species grows near melting snow banks on Shasta fir litter and duff although it may also be found in fresh condition in woods from which the snow had melted a month before. It has been observed in all summers from 1937 through 1941 and was especially abundant in 1941. In 1951 large areas were covered with all sizes of fruit bodies several weeks after melting of snow.


**Paxina nigrella** Seaver. — Found at first in 1938 and then in 1940 just after melting of the snows along the Sisson Southern Trail in deep Shasta fir woods on litter. Later, in 1941, the species was observed in abundance on Shasta fir litter at the edge of melting snow banks near Horse Camp. As the snow would move back a new area of production of these fruit bodies would develop. Five such areas were noted within a hundred feet near a protected snowbank at the edge of a grove of Shasta firs throughout July. Over 100 fruit bodies were collected.


**Peziza violacea** Pers. — On soil near spilled cement at the spike camp at Panther Creek Meadows Public Camp Ground, 7600 feet.


**Rhyparobius monascus** Mouton. — On deer dung. — Shasta fir woods on ridge between Horse Camp and Panther Creek.

Sarcosphaera amplissima (Fr.) Kanouse. — This species was collected four times in 1941: On sandy soil under a ponderosa pine tree on the north side of the mountain at about 5000 feet, under a ponderosa pine and chaparral shrubs on the southwest side of the mountain at 5500 feet, in Shasta fir duff on a ridge just below Horse Camp at 7800 ft., In 1942 it was found under pines in a lawn in Mount Shasta at 3550 feet. In 1946 it was found under litter in white fir-Shasta fir woods along the Sisson Southern Trail at 6000 feet. In June 1947 it was abundant throughout the Shasta fir forest especially along the Sisson Southern Trail between 6500 and 8000 feet. Collections: 15518, 15523, 15568, 16630, 18113, 20017. Dates: 12, 27 June, 16 July 1941; 30 May 1942; 28 June 1946; 20 June 1947. Abundance: III, D. Associates: Conifers below the White Bark Pine zone. Distribution: Europe, North Africa, North America, Mt. Shasta.

Helvellaceae.

Helvella californica Phill. — Two or three specimens have been noted in each summer from 1936 to 1941 in mossy sod near the Wagon Camp springs at about 5700 ft.; 18 sporophores were found on a water soaked white fir log forming a dam across Squaw Valley Creek at about 6000 feet; found once on a water soaked log of Shasta fir at Panther Creek meadows at about 7500 feet. Collections: 7593, 8655, 13324, 13353, 15543, 15582, 16631, 20242, 25642. Dates: 21 Aug. 1936; 20 Aug. 1937; 16 June, 7 July 1939; 12, 18 July 1941; 30 May 1942; 10 July 1947; 25 Aug. 1949. Abundance: IV, A, D. Associates: Abies concolor, Abies magnifica var. shastensis. Distribution: Nevada, Oregon, California, Mt. Shasta.


Tuberales.

Tuberaeaceae.

Hydnotria variiformis Gilkey. — Depending on the intensity of the search for this hypogaeous species it is common to
merely occasional. It occurs in rotten Shasta fir logs below or at the soil level, or in the ground near rotting Shasta fir logs. Mostly in the vicinity of Horse Camp at 8000 feet.


*Hydnotria tulasnei* Berk. & Br. — A specimen has been tentatively identified as this species. Collected in the timberline region on the southwest side of the mountain. Abundance: V, D. Associate: *Abies magnifica* var. *shastensis*. Distribution: Europe, Michigan, Mt. Shasta.

**Basidiomycetes.**  
**Heterobasidiomycetes.**  
**Uredinales.**  
**Melampsoraceae.**  

*Coleosporium madiae* Cke. — On *Madia gracilis*.

Observed on this host only in the Bear Springs area although the host occurs throughout the chaparral on the southwest side of the mountain between 4000 and 5000 feet.  

*Coleosporium solidaginis* (Schw.) Thuem. — On *Aster shastensis*. — On this host this has been found only on the large form along the Snowline Highway at 4500 feet and on the narrow leaved form the base of Diller Canyon at 5000 feet. The host, however, is found at all elevations and in most dryer areas between 4500 and 9000 feet.  
Collection: 15604, Exs. 120. Dates: 25 July 1941; one collection in late August 1940. Abundance: IV, C. Associates: *Arctostaphylos patula, Ceanothus velutinus, Purshia tridentata*. Distribution: On more than 125 species of the Compositae in Mexico, China, Japan, North America, Mt. Shasta.

*Cronartium comploniae* Arth. — On *Pinus contorta* var. *latifolia*. — Blister galls were formed on trees in the host colony at Military Pass on the northeast side of the mountain.  
Cronartium pyrifor me (Pk.) Hedgc. & Long. — On Pinus ponderosa. — Reported from Shasta Springs by Blasdale, 1919.

Hyalopsora polypodi i (Pers.) Magn. — On Cystopteris fragilis. — A colony of the host in the upper Wagon Camp spring area is regularly heavily infected.


Melampsora albertensis Arth. — On Populus tremuloides. — Reported by Blasdale, 1919, from Dunsmuir, in the Sacramento Canyon.

Melampsora arctica Rostr. — On Salix sitchensis. — One shrub of the host, observed so far only in Mud Creek Canyon, was completely covered by this species.


Melampsora lini (Pers.) Lév. — On Linum micranthum. — The colony of this annual host which occurs near the Water Supply spring above Howard was heavily infected in 1941. Other colonies of the host through the chaparral area were uninfected.


Melampsora euphorbiae-gerardiana e W. Müll. — On Euphorbia crenulata. — A specimen collected by E. P. Meincke, L. E. Ekvall and L. S. Gill near McCloud, 16 June 1924, is filed in the San Francisco field office of Forest Pathology, No. 29873.

Melampsora ribesii-purpureae Kleb. — On Salix scouleriana. — This host in common along drainage areas throughout the chaparrall below 5000 feet and occurs along creeks to some extent above that elevation. Its worst enemy is the oyster scale which kills out the larger shrubs. This rust occurs occasionally on isolated shrubs on the leaves of which it forms small, barely noticeable pustules in contrast to the large bright orange ones of M. arctica.

Melampsarella cerastii (Pers.) Schroet. — On Stellaria longipes. — The colony of this host which occurs at Bear Springs was infected in 1939.


On Abies concolor. — Mature trees along a lane between McCloud and Squaw Valley Creek spring between 4000 and 5000 feet were heavily infected on needles on at least the lower branches; also heavily infecting all of several young trees near MacBride Springs, 5000 feet. Collections: 18277, 20352. Dates: 25 July 1946, 25 July 1947. Abundance: III, A. Associates: Pseudotsuga taxifolia, Libocedrus decurrens. Distribution: On at least 12 species of Vaccinium and on several conifers in Mexico, Europe, Japan, North America, Mt. Shasta.

Pucciniastrum myrtilli (Schum.) Arth. — On Vaccinium caespitosum. — Collected once on a colony of the host in Panther Creek meadows.

On Vaccinium membranaceum. — Collected once on a colony of the host in Panther Creek meadows.

Pucciniastrum pustulatum (Pers.) Diet. — On Epilobium adenocaulon. — Seen and collected only once on a colony of the host along Squaw Valley Creek below the McCloud intake. Here it had parasitized most of the plants in the colony.


*Pucciniastrum pyrolae* (Pers.) Schroet. — On *Pyrola dentata* var. *integra*. — On a large colony of this host along the Sisson Southern Trail in Shasta fir woods.


On *Pyrola picta*. — On small colonies of the host in Mud Creek Canyon, in Squaw Valley Creek canyon and along the Sisson Southern Trail. Reported by Blasdale (1919) from Sisson (now Mount Shasta).


On *Chimaphila umbellata*. — Along Squaw Valley Creek at 5500 feet, and along the Sisson Southern Trail at 6000 feet. While the host is common the rust is rare.


On *Ramischia secunda*. — Along the Sisson Southern Trail. Also reported by Blasdale (1919) from Sisson.


*Pucciniastrum sparsum* (Wint.) Fisch. — On *Arctostaphylos nevadensis*. — Abundant on several shrubs along Squaw Valley Creek at about 6500 feet. With *Exobasidium vaccinii-uliginosii*.


On *Arctostaphylos patula*. — Seen only on the McCloud (south) side of the mountain where it was collected on each of two years in the chaparral along a road below the Squaw Valley Creek spring. It infects, and apparently kills, the leaves of an entire shrub. It was not ascertained whether this action thus kills the host or merely weakens its succeeding growth. Reported by Blasdale (1919) from Sisson, the type locality of *Uredo copelandii* Syd., a synonym.


*Uredinopsis copelandii* Sydow. — On *Athyrium filix-femina* var. *californicum*. — Based on a collection made by E. B. Copeland near Sisson (Mount Shasta) near the west base of the
mountain. Found more recently at the big spring at the foot of Squaw Valley Creek canyon, and in the Wagon Camp bog.


*Uredinopsis macrosperma* (Cke.) Magn. — On *Pteridium aquilinum* var. pubescens. — Found on fronds on the bluff at the foot of Squaw Valley Creek Canyon, 5000 feet. Reported from Sisson by Blasdale (1919).


**Pucciniaceae.**

*Aecidium graebnerianum* P. Henn. — On *Habenaria leucostachys*. — Found only once in the Wagon Camp bog, 5700 ft.


*Cumminsiella mirabilissima* (Pk.) Nannf. — On *Berberis piperiana*. — At the one time when the colony of this host on the lava flow above Hotlum Station was visited all the leaves on a number of scattered plants were mildly infected.


*Gymnosporangium libocedri* (P. Henn.) Kern. — On *Libocedrus decurrens*. — Trees at Bear Springs were found in several seasons to have the telial stages on the leaves of at least their lower branches.


On *Amelanchier pallida*. — Pycnia and aecia were observed abundantly on leaves, branches, peduncles, flowers and fruits on shrubs in the chaparral, at Bear Springs and at Widow Springs.

rens, *Pinus jeffreyi* at Bear Springs and Widow Springs; shrubs of the chaparral at other points.

On *Crataegus douglasii*. — Infecting leaves, branches, flowers and young fruits of trees along a creek in Mount Shasta, 3550 feet.

**Collection:** 15501. **Date:** 3 June 1941. **Abundance:** II, B. **Associates:** *Libocedrus decurrens*, *Pinus ponderosa*, *Abies concolor*.

Reported as *Aecidium blasdaleanum* Diet. & Holw. on *Crataegus rivularis* (a synonym of *C. douglasii*) from Shasta Springs and Sisson by Blasdale (1919). Specimens of *Gymnosporangium blasdaleanum* (Diet. & Holw.) Kern are filed in the Holway rust herbarium at the University of Minnesota.

**Distribution:** On at least 13 pomaceous species and *Libocedrus decurrens* in western Oregon and northern California; Mt. Shasta.

*Gymnosporangium bisepatum* Ell. — On *Libocedrus decurrens*. — A specimen collected at Sisson by W. C. Blasdale in Aug. 1884 was distributed in Ellis and Everhart, North American Fungi No. 3248.

*Nyssopsora echinata* (Lév.) Arth. — On *Ligusticum grayi*. — In the upper portions of Squaw Valley Creek, 8000—8500 feet, this fungus occurred on many leaves, stems and peduncles of the host. While the host occurs in the Squaw Valley Creek and Panther Creek basins as low as 5000 feet, infection by this pathogen has not been observed below 7500 feet.

**Collections:** 10297, 13384, 25615, Exs. 3. **Dates:** 8 Sept. 1938, 10 Aug. 1939, Aug. 1949. **Abundance:** III, C. **Associates:** *Pinus albicaulis*, *Tsuga mertensiana*. **Distribution:** On at least 11 umbelliferous species in western North America; Mt. Shasta.

*Phragmidium imitans* Arth. — On *Rubus leucodermis*. — Reported from Sisson and Shasta Springs on cultivated raspberry by Blasdale (1919).

*Phragmidium ivesiae* Syd. — On *Potentilla gracilis* ssp. nuttalii. — Several plants were infected along a street in Mount Shasta.

**Collection:** 15509, Exs. 144; **Date:** 16 June 1941. **Abundance:** V, C. **Associates:** Street weeds and garden plants. **Distribution:** On at least 24 rosaceous species west of the Mississippi in Canada and the United States; Mt. Shasta.

*Phragmidium occidentale* Arth. — On *Rubus parviflorus*. — Although the host is scattered through the chaparral this fungus has been found on it only in isolated instances especially along the road below the Squaw Valley Creek spring above McCloud; and along an old lane near the Mount Shasta Municipal spring, 4000 feet.

**Collections:** 14675, 20301, Exs. 82. **Dates:** 8 Aug. 1940, 18 July 1947. A specimen collected by E. B. Copeland at Sisson was distributed
by Sydow in his exsiccatum „Uredineen“ No. 1789 as indicated by a collection in the Holway herbarium.

*Phragmidium rosae-californicae* Diet. — *On Rosa gymnocarpa.* Occasional shrubs of the host are infected with both stem and leaf lesions.


*Phragmidium rubi-idaei* (DC.) Karst. — *On Rubus parviflorus.* A specimen collected by W. C. Blasdale, 28 July 1894, at Sisson was distributed in Ellis and Everhart, North American Fungi. No. 3245.

*Puccinia absinthii* Hedw. f. — *On Artemisia tridentata.* Found on several shrubs on the north side of the mountain near Bolam Station, 5000 ft.


*Puccinia asarina* Kunze. — *On Asarum hartwegii.* Found on occasional plants in rocks on the north side of Cascade Gulch and along Squaw Valley Creek, 5000—6500 feet.


On *Asarum lemmonii.* — Reported from Sisson by Blasdale (1919). Distribution: Siberia, Japan, Idaho to British Columbia, south to central California; Mt. Shasta.

*Puccinia atrofusca* (Dudl. & Thomps.) Holw. — *On Carex multicaulis.* On colonies of the host along the Sisson Southern Trail and the Shasta Snowline Highway, 5000—5500 feet.


*Puccinia calochortii* Pk. — *On Calochortus nudus.* Common on a colony of the host along the Wagon Camp road between Wagon Camp and Bear Springs, 5500 feet.

14 liliaceous species in Mexico and western North America; Mt. Shasta.

**Puccinia caricis** (Schum.) Schroet. — Collected on three different species of Carex:

- On *Carex amplectens* once in 1939.


**Puccinia cicutae** Posch. — On *Cicuta occidentalis*. — Reported from Sisson by Blasdale, (1919).

**Puccinia circaeae** Pers. — On *Circaea pacifica*. — Reported from Sisson by Blasdale (1919).

**Puccinia comandrae** Pk. — On *Comandra umbellata*. — Reported by Blasdale (1919) from Shasta Springs.


**Puccinia cruciferarum** Rud. — On *Cardamine bellidifolia var. pachyphylla*. — One plant in a cool, moist spot behind a lava rock at 8500 feet was weakly infected. The host occurs in such isolated locations throughout the White Bark Pine zone. The fungus has been found only once.


**Puccinia douglasii** Ell. & Ev. — On *Phlox douglasii*. — On several plants on a ridge and in a basin south of Horse Camp; 7800—8000 feet.


*Puccinia effusa* Diet. & Holw. — On Viola lobata. — Reported by Blasdale (1919) from Dunsmuir.

*Puccinia extensicola* Plowr. — On Carex brainerdii. — Covering a clump of this sedge in Mud Creek Canyon at about 6500 feet.

Collection: 13390, Exs. 5. Date: 10 Aug. 1939. Abundance: IV, C. Associate: Eriogonum umbellatum ssp. polyanthum. Distribution: On over 100 species of sedge in Europe, South America, Western North America; Mt. Shasta.

*Puccinia extensicola* var. asteris (Thuem.) Arth. — On Aster occidentalis. — Covering a colony of this host along a creek at Wagon Camp, 5700 feet.


On Elymus glaucus. — Collected once near Wagon Camp.


On Elymus glaucus ssp. jepsonii. — Collected on the only plant of the host found on the mountain. This plant, found at Bear Springs, was heavily infected.


On Elymus elymoides (Sitania hystryx). — Weak to mild infections on scattered to isolated clumps of the grass have been noted in each year at Horse Camp; found once on the north side of the mountain near Bolam Creek Canyon.


*Puccinia grindeIIiae* Pk. — On Haplopappus bloomerii var. angustatus. — On several shrubs in white fir-Shasta fir woods in
Cascade Gulch on the south side of the lava flow terminating at MacBride Springs, 6000 feet.


On Chrysothamnus nauseosus var. occidentalis. — On several shrubs near Bolam Station, 5000 feet.


Puccinia harknessii Vize. — On Stephanomeria lactucina. — Occasional on the host throughout the chaparral.


Puccinia heucherae (Schw.) Diet. — On Mitella pentandra. — Infection was found on one plant near a bridge across Squaw Valley Creek below the McCloud intake at 5000 feet. The host occurs throughout the Squaw Valley Creek and Panther Creek drainage basins from 8000 to below 5000 feet. The fungus has been found also on one colony along Panther Creek below the meadows.


On Tellima grandiflora. — A collection made by W. C. Blasdale at Shasta Springs, 7 Aug. 1894, is filed in the Holway herbarium. — Distribution: On at least 45 saxifragaceous hosts in Europe, Eastern Asia, Japan, North America; Mt. Shasta.

Puccinia hieraciifoli (Schum.) Mart. — On Agoseris grandiflora. — On several plants in the MacBride Springs and Bear Springs areas, 5000 feet.


On Agoseris heterophylla. — On several plants in the MacBride Springs area.


On Agoseris scorzoneriaefolia. — On two plants on a flat at 9000 feet near the One Mile Post along the Summit Trail above Horse Camp; on a number of plants scattered through colonies of the host in the open lava flats above Panther Creek Meadows.

On Hieracium albiflorum. — On leaves and peduncles of plants near the Municipal Spring at Howard, and in Mud Creek Canyon. Collections: 13384, 13394, Exs. 7. Dates: 10 Aug. 1939; once in 1941. A specimen in the Holway Herbarium was obtained by Holway at Sisson, 28 May 1894. Abundance: IV, C. Associates: Pinus ponderosa, Libocedrus decurrens, Pseudotsuga taxifolia.


Puccinia melanconioides Ell. & Holw. — On Dodocatheron sp. — A specimen in the Holway Herbarium was collected by Holway at Dunsmuir, 30 May 1894.

**Puccinia menthace** Pers. — On *Monardella odoratissima*.

- Occasional plants of the host are infected by this fungus on different parts of the mountain in different years. The fungus causes mild spotting of the leaves to distortion of the stems and branches.

  
  Abundance: III, C. Associates: *Abies concolor, Abies magnifica* var. *shastensis*. Distribution: On at least 50 labiates in North and South America, Europe, Africa, Asia, Japan; Mt. Shasta.

**Puccinia monoica** (Pk.) Arth. — On *Arabis platysperma*.

- Infrequently plants of this host are found without flowers. The internodes become elongated and instead of a flower there occurs one bract on which the pustules of the rust occur. This rust has been observed only on the typical variety of the host in the Shasta fir zone although the host reaches the upper timberline as a dwarf variety.


  On *Arabis sp.* — On a few plants along the McCloud River Railroad near the Snowline Highway, 4000 ft.


**Puccinia oxyriae** Fekl. — On *Oxyria digyna*.

- While this host occurs commonly above 8000 feet in moist places sheltered under lava boulders, the fungus has been found only once and that at 10,000 feet on the west side of Shastina.


**Puccinia palmeri** Diet. & Holw. — On *Penstemon menziesii* var. *davidsonii*.

- While this host is common in the upper timberline region and the White Bark Pine zone this fungus has been found only once on it.


  On *Penstemon newberryi*.

- On a colony of this species growing at 5500—6000 feet in Cascade Gulch near the Sisson Southern Trail; and on the few plants growing in Shasta fir woods on the north slope of the ridge south of Horse Camp, 8000 feet.


158
Distribution: On at least 13 species of *Pentstemon* in the western United States.

*Puccinia pattersonia*na Arth. — On *Elymus hansenii*. — Found only once on a small colony of the host in a grove of firs below Wagon Camp.


*Puccinia pentslemonis* Pk. — On *Pentstemon deustus* ssp. *deustus*. — Colonies of the host along the Sisson Southern Trail between 4500 and 5000 feet are heavily infected annually.


*Puccinia pimpinellae* (Str.) Mart. — On *Osmorhiza nuda*. — Found in 1937 at Wagon Camp on a few plants; in 1947 a heavy infection of this host was noted in the same area.


*Puccinia paee-sudeticae* (Westd.) Jørgstad. — On *Poa pratensis*. — Occasional on this host in the vicinity of Horse Camp, 8000 ft., and Bear Springs, 5000 ft.


*Puccinia pseudocymopteri* Holw. — On *Cymopterus terebinthinus*. — Occasional on the colony of the host on the lava flow terminating at MacBride Springs.


Collection: 15503. Date: 7 June 1941. Abundance: II, C.

On *Trisetum spicatum*. — A number of plants near one of the springs at 8250 feet on a ridge above Horse Camp was infected.

*Puccinia rubigo-vera* var. *agropyri* (Erikss.) Arth. — On *Aquilegia formosa*. — Several plants growing on the edge of the Bear Springs meadow under incense cedars were infected in one year.


*Puccinia rufulescens* Diet. & Holw. — On *Pedicularis densiflora*. — Several colonies in the chaparral near MacBride Springs have been found infected.


*Puccinia scandica* Johanss. — On *Epilobium clavatum*. — About half of a colony of the host near a small spring above Panther Creek Meadows was completely infected and sterilized by this species.


*Puccinia sejuncta* Syd. — On *Hieracium* sp. — Reported from Sisson by *Blasdale* (1919).

*Puccinia subdecore* Syd. & Holw. — On *Brickellia grandiflora*. — Usually the lower leaves, sometimes all the leaves, on stems of this host were spotted by pustules of this rust. In the lava flow above Hotlum Station.


*Puccinia vagans* (DC.) Arth. — On *Clarkia rhombifolia*. — Observed occasionally on host plants in the chaparral.


On *Epilobium minutum*. — A specimen collected 24 June 1937 by *V. S. Brown* at Mount Shasta is deposited in the herbarium
of the field office of Forest Pathology, San Francisco, No. 87585. 
Distribution: On at least 15 onagraceous species in Europe, Asia, 
Japan, Australia, New Zealand, South America, western North 
America; Mt. Shasta.

**Puccinia vagans** var. *gayophyti* Arth. — On *Gayophytum* spp. — Collected on some and observed on most of the species 
of this host genus on the mountain from 4000 feet to 8000 feet. In 
places whole colonies of annual hosts of this genus were infected. 
IV, C. Associates: *Abies magnifica* var. *shastensis*; *Ceanothus velutinus*, *Aronstabophylos patula*.

On *Gayophytum diffusum*. — Reported by Blasdale (1919) 
from Sisson. Distribution: On 7 species of *Gayophytum* in western 
North America; Mt. Shasta.

**Puccinia veratri** Niessl. — On *Veratrum californicum*. — 
A specimen collected by W. C. Blasdale at Sisson, 1 July 1894, 
was distributed in the *Sydow exsiccatum* „Uredineen“ No. 1386. 
Noted in the Holway Herbarium.

**Puccinia violae** (Schum.) DC. — On *Viola adunca*. — 
Reported by Blasdale (1919) from Sisson.

**Uromyces amoenus** Syd. — On *Anaphalis margaritacea*. 
The host has been found only in Mud Creek Canyon and here this 
rust occurs on scattered plants between 6500 and 8000 feet. 
Collection: 14704, Exs. 87. Date: 22 Aug. 1940. Abundance: IV, C. 
Associates: *Abies concolor*, *Abies magnifica* var. *shastensis*. Distribu-
tion: On *Anaphalis* species in western North America; Mt. Shasta.

**Uromyces aterrimus** Diet. & Holw. — On *Allium validum*. — A specimen collected Aug. 1894 at the base of Mt. Shasta 
by W. C. Blasdale was distributed in Ellis and Everhart, 
North American Fungi 3344, Fungi Columbiani No. 861.

**Uromyces aureus** Diet. & Holw. — On *Allium validum*. — 
Common wherever the host occurs on the mountain: in Panther 
Creek Meadows, Squaw Valley Creek meadows, Wagon Camp, and 
hanging gardens of Mud Creek Canyon. Reported by Blasdale 
(1919) from Sisson. 
Collections: 8582, 8614, 10257, 13412, 18403, 20328, Exs. 15. Dates: 
1947. Abundance: II, C. Associates: *Phyllodoce empetriformis*, *Kal-
mia polifolia*. Distribution: On at least two liliaceous species in 
northern California; Mt. Shasta.

**Uromyces fabae** (Pers.) d. By. — Occasional colonies of 
*Vicia americana* and *Lathyrus lanzzwertii* var. *aridus* were heavily 
infected with this rust in the MacBride Springs and Wagon Camp 
areas. and in the chaparral along the Shasta Snowline Highway.

_ U r o m y c e s h o l w a y i_ Lagh. — On Lilium columbianum. — A specimen collected by W. C. Blasdale at Sisson in July, 1894, was distributed in Ellis and Everhart, North American Fungi, Second Series, No. 3241, represented in the Holway Herbarium.

_ U r o m y c e s h y p e r i c i _ (Spreng.) Curt. — On Hypericum perforatum. — The only colony of this host found on the mountain, in a small meadow near a railroad fill at Howard, was mildly infected with this rust.


_ U r o m y c e s i n t r i c a t u s _ Cke. — On Eriogonum latifolium ssp. nudum. — Occasional on this species throughout the chaparral especially along the Sisson Southern Trail on leaves and peduncles.


On Eriogonum marifolium. — Occasional on plants in lava flats in the Horse Camp area.


On Eriogonum umbellatum ssp. polyanthum. — Several plants in Mud Creek Canyon had complete infection on leaves, stems and peduncles caused by this rust; the colony on the north side of the mountain was apparently uninfected when observed in 1938, but a collection was made from it in 1949. Collections: 14710, 25697, Exs. 88. Dates: 22 Aug. 1940, 26 Aug. 1949. Abundance: III, C. Associates: Pinus ponderosa, Abies concolor. Distribution: On at least 43 polygonaceous species in western North America; Mt. Shasta.

_ U r o m y c e s j u n c i _ (Desm.) L. Tul. — On Juncus parryi. — Occasional clumps of the host in the Horse Camp area show mild infection on culms.

Uromyces lilii Clinton. — On Lilium columbianum. — A specimen collected by J. J. Davis at Sisson, July 1894, was distributed by Ellis and Everhart in North American Fungi, No. 3241.

Uromyces occidentalis Dietel. — On Lupinus latifolius. — A record was reported by Dietel in Hedwigia, Beibl. 42: 98. 1903, from Sisson.

Uromyces proeminens (DC.) Pass. var. proeminens. — On Euphorbia crenulata. — Only two of the few host plants sporadically occurring along the new Shasta Snowline Highway have been found infected.

On Euphorbia serpyllifolia. — On a colony of this host along the Shasta Snowline Highway in the new pine plantation at about 4000 feet.

Uromyces spragueae Harkn. — On Calyptridium umbelatum var. caudicifera. — Occasional colonies or individuals on lava flats and openings in the upper Shasta fir zone and timberline area were completely infected; from 8000—9500 feet. Typical material at lower elevations has not been found infected.

Ustilaginales.
Tilletiaceae.

Engylooma compositarum Farl. — On Hieracium cynoglossoides var. nudicaule. — On a colony along the Squaw Valley Creek spring road at 4000 feet in the chaparral north of McCloud.

Urocystis agropyri (Preuss) Schroet. — On Elymus glaucus. — Six leaves on one clump of the host were found infected below Wagon Camp. The area was heavily grazed by migrant herds of sheep. A number of plants were found to be infected in Wagon Camp meadow two years after grazing was discontinued.
shastensis, Libocedrus decurrens. Distribution: On more than 11 grasses in Europe and North America; Mt. Shasta.

Urocystis sorosporioides Koern. — On Anemone occidentalis. — While the host has been found commonly in the timberline region, and observed in all stages of growth, throughout the southwest quadrant of the mountain this fungus has been found only once on a colony of the host in the Shasta Fir zone near an old trail on the west wall of Mud Creek Canyon.


Ustilaginaceae.

Cintractia caricais (Pers.) Magn. — On Carex multicaulis.

— This host is common in open Shasta fir woods on slopes but was found infected with this smut prior to 1949 only on the west wall of Mud Creek Canyon; in 1949 this smut was found on several clumps near Squaw Valley Creek Meadows.


On Carex nigricans. — This host is common in the higher springs in the Panther Creek and Squaw Valley Creek basins but the fungus occurs on it infrequently.


On Carex spectabilis. — The host is common around all springs in the higher Panther Creek and Squaw Valley Creek basins. This fungus is very common on it in all locations.


Cintractia externa (Griff.) Clint. — On Carex spectabilis.

— Collected once at the South Gate springs.


Ustilago bullata Berk. — On Bromus carinatus. — Common on most of the host plants in the chaparral near the Sisson Southern Trail at MacBride Springs.

Collections: 13298, 13343, 13386, Exs. 43. Dates: 30 June, 21, 27 July

On Bromus tectorum. — One colony in the chaparral at 4500 feet was heavily infected.


Ustilago shastense Zundel. — On Polygonum shastense. — This shrubby Polygonum forms mats on open lava fields in the White Bark Pine and upper Shasta Fir zones. Occasionally the flowers in whole plants are infected by this smut. When this occurs the usually cream to scarlet flowers are turned brown.

Collections: 13381, 18428, 20468, 27017, Exs. 63. Dates: 8 Aug. 1939, 2 Sept. 1946, 20 Aug. 1947, 28 Sept. 1950. Observed in late season weeks in all years throughout the range of the host on the mountain. Abundance: III, B. Associate: Eriogonum marifolium. Distribution: Known only from these localities. And a recent collection from 8500 ft. on Lassen Peak.

Ustilago spegazzinii var. agresti (Syd.) G. W. Fisch. & Hirsch. — On Elymus hansenii. — Seen only in the vicinity of Wagon Camp.


On Elymus elymoides. — Common on occasional clumps of this grass in the vicinity of Horse Camp.


On Stipa californica. — Common on occasional clumps of this grass in the vicinity of Horse Camp and in the timberline area on the east side of Bolam Creek Canyon.


Ustilago striaeformis (West.) Niessl. — On Elymus glaucus. — Found once in the dry meadow at MacBride Springs.

Ustilago violacea (Pers.) Fckl. — On Silene grayi. — Occasional in anthers of the host on lava flats and slopes near Horse Camp, at the head of Cascade Gulch at 9500 feet, and above Panther Creek meadows at 8000—9000 feet.

On Silene douglasii. — On the north side of the mountain along a lane above Bolam Station between 6000 and 8000 feet.

Ustilago williamsii (Griff.) Lavrov. — On Stipa occidentalis. — On occasional plants along the Horse Camp-Wagon Camp Trail above Wagon Camp.

Tremellales.

Tulasnella fuscoviolacea Bres. — On rotten Shasta fir wood. Possibly it is more common than this one collection indicates, and other species of this, as well as other resupinate tremellaceous fungi may occur on the mountain.

Tulasnella sp. — On Abies magnifica var. shastensis. — On rotten wood in the vicinity of Horse Camp.
Collections: 18139; 18140. Date: 30 June 1946. Abundance: IV, A. Associate: The host.

Dacrymycetaceae.

Dacrymyces deliquesceens (Bull.) d. By. — On Abies magnifica var. shastensis. — Common on logs, branches, twigs and hand hewn boards of Shasta fir throughout the Shasta Fir zone. The imperfect stage is less frequent than the perfect.
Collections: 8513, 14619, 14645, 15556, 18041, 20365. Dates: 19 June 1937; 3, 8 June 1940; 16 July 1941; 24 June, 4 Sept. 1946; 29 July 1947. Seen at other times in every year but only large colonies of fructifications taken. Abundance: II, A. Associate: The host.


On *Pinus ponderosa*. — On dead wood along the Sisson Southern Trail in the chaparral between 4000 and 4500 feet, and along the Mud Creek Dam Road, a mile north of McCloud at 4000 feet. Collections: 19302, 19331, 19340. Dates: 7, 8 April 1947. Abundance: IV, A. Associates: *Abies concolor, Arctostaphylos patula*.


Guepiniopsis alpina (Tr. & Earle) Brasfield. — The commonest saprobic fungus on the mountain. It occurs on all forms of dead wood of Shasta fir at all elevations, as well as on dead wood of white bark pine, white fir and montain hemlock, and on boards of ponderosa pine. After light rains in the summer at Horse Camp large numbers of fruit bodies become evident on logs, branches, twigs, hard hewn boards and structural timbers.


Treemellaceae.

Pseudohydnum gelatinosum (Fr.) Karst. — In 1939, 1946 and 1947 several rotten Shasta fir logs near Horse Camp, partially sunken in the ground and thus kept partially moist were pulled apart in search for hypogaeous fungi. This species was found inside some of these logs. Only a few small fruit bodies were found at each time.


Treemella mesenterica (S. F. Gray) Pers. — On Quercus kelloggii. — Found once on dead wood on shrubs in the chaparral along the Sisson Southern Trail at about 4000 feet.


Auriculariaceae.

Auricularia auricularis (S. F. Gray) G. W. Martin. — On Acer glabrum, Abies concolor. — In 1936 one collection was made on sticks of a frondose species, tentatively assigned to Acer glabrum, near the Sisson Southern Trail spring, 6500 feet. In 1947 it was found to be common on a fir log at the base of the zig-zag on this trail at 5000 feet.

Homobasidiomycetes.

Exobasidiales.

Exobasidiaceae.

Exobasidium vaccinii (Fckl.) Wor. — On Arctostaphylos nevadensis. — Infrequent on this common shrub at the lower limits of its range. At 6000 feet in a valley along the Sisson Southern Trail and at 5000 feet in Mud Creek Canyon. Collection: 13383. Date: 10 Aug. 1939. Abundance: IV, B. Associates: Abies concolor, Abies magnifica var. shastensis, Pinus ponderosa, Pinus lambertiana, Pseudotsuga taxifolia.


Polyporales.

Cyphellaceae.

Solenia ochracea (Pers.) Fr. — Collected once by W. C. B l a s d a l e on rotten wood at Sisson's, now Mount Shasta, Siskiyou
Co., Calif. It was distributed as No. 292 in his "Fungi of California". Duplicates have been seen from the New York Botanical Garden Herbarium and from the Herbarium of the University of California, No. 671015, under the name of Solenia stipitata (Pers.) Fckl. Collected 30 July 1894. Distribution: Europe, North America; Mt. Shasta.


Thelephoraceae. " "

Aleurodiscus amorphus (Pers.) Rab. ex Cke. — On Abies concolor, Abies magnifica var. shastensis. — On the under side of branches and twigs still on trees between 6000 and 7000 feet in woods near the Shasta Snowline Highway, and at 4000 feet along the Mud Creek Dam road.


Aleurodiscus diffusus (Sacc.) Burt. — On Arctostaphylos nevadensis. — Common on dead branches on a ridge below Horse Camp at about 7600 feet in the Shasta Fir zone.


On Arctostaphylos patula. — On several dead sticks in the chaparral along the Junction Road between the Snowline Highway and Wagon Camp at 6000 feet in the lower Shasta Fir zone.


Aleurodiscus fruticetorum W. B. Cke. — On Ceanothus velutinus, Arctostaphylos patula. — On dead sticks of shrubs


_*Corticium corruge* (Burt) Burt in sched., in Rogers & Jackson, — On _Abies magnifica_ var. _shastensis, Sambucus racemosus, Tsuga mertensiana_. — On bark of trees, logs, sticks and litter in the Horse Camp and Squaw Valley Creek areas, 8000 ft. The Horse Camp area on Mount Shasta or the Wodanthal area on Mt. Adams is the type locality. — This species was collected by E. B. Copeland on Mt. Shasta and distributed in Baker's "Fungi of the Pacific Slope". Collections: Copeland; 18142, 18444, 20227, 24045, 24060, 25626, 28311. Dates: 1903; 2 July, 4 Sept. 1946; 10 July 1947; 3, 4 July 1948; 24 Aug. 1949; 5 July 1951. Abundance: III, A, B. Associates: _Abies magnifica_ var. _shastensis, Tsuga mertensiana_. Distribution: Western United States; Mt. Shasta.


Corticium luridum Bres. — On rotten Shasta fir wood at Horse Camp, 8000 ft.


Corticium radiosum Fr. — On rotten Shasta fir wood near Horse Camp, 8000 feet.

Corticium sp. — On Cercocarpus ledifolius, Quercus chrysolepis, Quercus kelloggii. — On rotten wood in chaparral areas.

Corticium sp. — On rotten Shasta fir wood at Horse Camp.

Corticium sp. — On Quercus kelloggii Newb. — On rotten wood along the road to Squaw Valley Creek Spring.

Corticium sp. — On Arctostaphylos patula, Cercocarpus ledifolius. — On rotten branches in the chaparral.

Corticium sp. — On rotten Shasta fir wood near Horse Camp, 7800 feet.

Corticium sp. — On rotten Shasta fir wood at Horse Camp. Panther Creek.

Corticium sp. — On rotten wood of Shasta fir at Horse Camp.

Corticium sp. — On rotten Shasta fir wood at Horse Camp.


Hymenochaete tabacina [(Sow.) ex Fr.] Lév. — On Ceanothus velutinus. — Chaparral shrubs apparently advanced up the mountain in areas which had been cut over or burned off. A these areas become reseeded with white fir and the firs reach 10—30 feet or more in height they smother these chaparral shrubs. The branches of several such smothered shrubs were found to be covered with this species, 5000—6500 feet. Collections: 15519, 18098, 18099. Exs. 122. Dates: 27 June 1941; 28 June 1946. Abundance: III, B. Associate: Abies concolor, Pinus ponderosa.


Pellicularia flavescens (Bon.) Rogers. — Collected on rotten Shasta fir wood at Horse Camp once in 1937. Abundance: V, A. Associate: The host. Distribution: Germany, Austria, Poland, Eastern Canada, New England, Florida, Iowa, Missouri; Mt. Shasta.

*) The above collections of Corticium were submitted for identification to Dr. Jackson before his death. Each group of collections had been assigned a separate designation in reporting on the sendings. The same is true for the records of Peniophora which follow. As his students complete studies of this material it is being reported on in the literature.
Pelicularia subcoronata (Hoehn. & Litsch.) Rogers. — On rotten wood of Pinus ponderosa along the Sisson Southern Trail, 4500 feet.


Pelicularia vag a (Berk. & Curt.) Rogers. — On Pinus ponderosa, Abies magnifica var. shastensis. — On rotten wood of the former host along the Mud Creek Dam road at 4000 feet; on the latter at Horse Camp, 8000 feet.


Pelicularia sp. — On Quercus kelloggi along the Squaw Valley Creek road, 4000 feet.


Peniophora assimilis Jackson & Deardon. — On Purshia tridentata branches about a mile north of Andesite Station, 5000 ft. 


Peniophora chaetophora (Hoehn.) Hoehn. & Litsch. — On rotten wood of Tsuga mertensiana along Squaw Valley Creek at about 8000 ft.


Peniophora cinerea Auctt. — On Cercocarpus ledifolius, Quercus kelloggi. — Material assigned to this complex was obtained from near Bolam Station, and from along the Squaw Valley Creek Road.


Peniophora cornosa Burt. — On rotten wood of Shasta fir near Horse Camp, 7800—8000 feet.


Peniophora crassa Burt ex Peck. — On Pinus ponderosa. — On rotten wood along the Sisson Southern Trail, 4500 feet.


174
Peniophora exima Jackson & Deardon. — On hand made Shasta fir boards at Horse Camp.

Peniophora gracillima Ell. & Ev. — On rotten Pinus ponderosa wood along the Mud Creek Dam road.

Peniophora incarnata? (Pers.) Cke. — On Cercocarpus ledifolius, Quercus kellogii. — On rotten wood near Bolam Station on the north side of the mountain; and along the Squaw Valley Creek road on the south side of the mountain; 4000—5000 feet.

Peniophora pallidula Bres. — On rotten Shasta fir wood in the Horse Camp area.

Peniophora sanguinea (Fr.) Hoehn. & Litsch. — On rotten Pinus ponderosa wood, Mud Creek Dam road, 4000 feet.

Peniophora (near) subulata (Bourd. & Galz.) Donk. — On rotten Shasta fir log at Horse Camp, 8000 feet.

Peniophora sp. — On rotten Shasta fir wood at Horse Camp, 8000 ft.
Collection: 18133. Date: 30 June 1946. Abundance: V, A. Associate: The host.

Peniophora sp. — On Arctostaphylos patula, Cercocarpus ledifolius. — On dead wood along the Mud Creek Dam road, and a mile north of Andesite Station, 4000—5000 feet.

Peniophora sp. — On bark of Libocedrus decurrens north of Andesite Station on the north side of the Mountain.
Peniophora sp. — On Purshia tridentata branches near Andesite Station.

Peniophora spp. — On dead wood of Shasta fir and Ceanothus velutinus; on the former on ridges north of Horse Camp at 8100 feet; on the latter at the north side of Cascade Gulch at 6000 feet.

Phlebiella candidissima (Schw.) W. B. Cke. — Common on rotting wood of Shasta fir in the Horse Camp area at 7800 to 8000 feet. Usually this is found in small patches inside of logs because of the lower evaporation rate in such locations contrasted with that on the outside of logs, and the consequent higher humidity. Also at Panther Creek meadows.

Phlebiella candidissima (Schw.) W. B. Cke. — Common on rotting wood of Shasta fir in the Horse Camp area at 7800 to 8000 feet. Usually this is found in small patches inside of logs because of the lower evaporation rate in such locations contrasted with that on the outside of logs, and the consequent higher humidity. Also at Panther Creek meadows.

On Abies concolor. — On rotten wood along the Sisson Southern Trail between 5000 and 6000 feet.

Stereum hirsutum Willd. ex Fr. — On Arctostaphylos patula, Ceanothus velutinus, Quercus kelloggii, Quercus chrysolepis, Salix scouleriana. — On dead wood in chaparral areas on the west and north sides of the mountain, 4000—5000 feet.

Stereum hirsutum Willd. ex Fr. — On Arctostaphylos patula, Ceanothus velutinus, Quercus kelloggii, Quercus chrysolepis, Salix scouleriana. — On dead wood in chaparral areas on the west and north sides of the mountain, 4000—5000 feet.

Stereum rugisporum (Ell. & Ev.) Burt. — On Abies concolor, Abies magnifica var. shastensis, Tsuga mertensiana. — Common on charred and unburned fallen logs in the Shasta Fir zone between Horse Camp and Mud Creek Canyon, and in the White Fir zone along the Sisson Southern Trail. The burned logs apparently resulted from spot lightning fires confined to single trees in the forest.

Stereum rugisporum (Ell. & Ev.) Burt. — On Abies concolor, Abies magnifica var. shastensis, Tsuga mertensiana. — Common on charred and unburned fallen logs in the Shasta Fir zone between Horse Camp and Mud Creek Canyon, and in the White Fir zone along the Sisson Southern Trail. The burned logs apparently resulted from spot lightning fires confined to single trees in the forest.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.

Distribution: North America; Mt. Shasta.
Tomentella sp. — On rotting Shasta fir wood at Horse Camp, 8000 ft.

Trechispora brinkmannii (Bres.) Rog. & Jacks. — On rotting Shasta fir wood at Horse Camp.

Merulaceae.

Merulius atropurpureus W. B. Cke. — One collection was made on rott ing wood and bark of Shasta fir logs along the Sisson Southern Trail at about 7000 feet.
Collection: 10117 (type). Date: 17 June 1938. Abundance: V, A. Associate: Abies magnifica var. shastensis. Distribution: Known only from this collection.

Merulius bellus Berk. & Curt. — Assignment of the following collections to this species is tentative. — On Abies concolor, Abies magnifica var. shastensis, Cercocarpus ledifolius, Pinus attenuata, Tsuga mertensisana. On rotten wood of these hosts in Shasta Fir, White Fir, Sierra Mixed Conifer and Chaparral associations between 4000 and 8000 feet.

Merulius ceraeellus Berk. & Curt. — Collected on rotting Shasta fir logs at Horse Camp, 8000 feet.

Merulius fugax Fr. — On rotten wood of Shasta fir, Horse Camp.

Merulius ravenelii Berk. — On Abies concolor, Abies magnifica var. shastensis. — On rotting wood at Horse Camp, 8000 feet, on the north side of Cascade Gulch, 6000 feet, and at the foot of the Sisson Southern Trail zig-zag, 5000 ft.
**Merulius vastator** Fr. — On rotting *Pinus ponderosa* log along the Mud Creek Dam road, 4000 feet.  

**Phlebia albida** Fr. — On *Abies concolor, Abies magnifica var. shastensis, Tsuga mertensiana*. — Occasionally found on logs throughout forests of these species. In some cases it becomes effused in large patches for a number of feet along the under side of logs with or without bark. Also producing a curtain-like formation hanging down from the under side of logs lying across depressions in the forest floor.  

**Coniophoraceae.**

**Coniophora olivacea** (Fr.) Karst. — Collected on rotting wood of Shasta fir logs in the Horse Camp area, 7800—8100 feet.  
Distribution: Europe, North America, Mt. Shasta.

**Serpula americana** (Burt) W. B. Cke. — On *Abies concolor, Abies magnifica var. shastensis, Pinus ponderosa, Tsuga mertensiana*. — Occasional on fallen logs from 5000 to 8000 feet in all zones between those elevations. It is found most frequently on Shasta fir logs and when growing luxuriently is subject to attack by numerous small beetles.  

**Clavariaceae.**

**Clavaria abietina** Fr. — On very rotten wood of *Abies concolor* along the Sisson Southern Trail at about 5000 feet.  

**Clavaria conjuncta** Pk. — Under Shasta fir duff along the Sisson Southern Trail, along Squaw Valley Creek, and near Horse Camp.


*Clavaria obtusissima* Pk. — Collections have been made in the Sierra Mixed Conifer zone under a ponderosa pine, and along the Sisson Southern Trail in the Shasta Fir zone under duff and litter.

*Clavaria pinicola* Burt. — Found under rotting Shasta fir logs near Horse Camp, 8000 feet.

*Clavaria secunda* Berk. & Curt. — Subhypogaeous under *Abies concolor* and Shasta fir duff at 6000 feet along the Sisson Southern Trail.

*Clavaria subdecurrrens* Coker. — On the under side of rotting Shasta fir wood lying on the ground near Horse Camp, 8000 feet.

*Typhula* sp. — On overwintered herbage on open slopes of the mountain, on grasses in a spring and on overwintered herbage wherever it is kept moist throughout the winter as well as at Wagon Camp, small sclerotia of the *Typhula* type have been found on *Arnica viscosa, Athyrium americanum, Castilleja miniata, Cryptogramma acrostichoides, Hulsea nana, Juncus orthophyllus, Lupinus obtusilobus* and *Veratrum californicum*; 5700—10,000 feet.
Collections: Among others: 15599, 16802, 18009, 18091, 18152, 18311, 20221. Dates: 23 July 1941; 7 Sept. 1942; 21, 27 June, 2, 30 July 1946; 2 July 1947. Abundance: III, C. (Attempts to produce the perfect state in culture have so far been unsuccessful.)
Hydnaceae.

Calodon amicus Quél. — A colony of 15 specimens of this species was found on the ground in Shasta fir woods under Arctostaphylos nevadensis shrubs along the Sisson Southern Trail at 7500 feet. Several years later a half dozen specimens were taken under Abies concolor duff on the north side of Cascade Gulch, 6000 feet.


Echindontium tinctorum Ell. & Ev. — Observed on several trees of Shasta fir and white fir above the 6 mile post along the Sisson Southern Trail at about 6000 feet in the lower Shasta Fir zone; and along the Horse Camp-Wagon Camp Trail at 7000 feet on Shasta firs.


Mycoacia alboviride (Morg.) Miller & Boyle. — Collected on rotten Shasta fir wood at Horse Camp, 8000 feet.


Odontia cristulata Fr. — On Quercus kelloggii. — Collected from several rotting logs and branches of the host along the lane from McCloud to the Squaw Valley Creek spring.


Odontia crustosa (Fr.) Quél. — On dead branches of Arctostaphylos patula along the Sisson Southern Trail at 4500 feet.


Polyporaceae.

Aurantioporellus alboluteus (Ell. & Ev.) Murr. — Common on the under side of decaying Shasta fir logs throughout the Shasta Fir zone. The specimens must be collected within two weeks of the time the snow pack has melted from the logs on which they grow, or the collector will find little more than a pile of red dust under the log — remains from the action of hundreds of tiny beetles (Dacne picea) found in every collection made. Immediate fumigation is always necessary.

On Tsuga mertensiana. — Collected once at Squaw Valley Creek meadows.

Coltricia perennis (L. ex Fr.) S. F. Gray. — Found occasionally on duff in the Shasta Fir, White Fir and Sierra Mixed Conifer zones.

Coriolus hirsutus (Fr.) Quél. — Collected once on White Fir near Mount Shasta in June 1941. Abundance: IV, A. Distribution: Asia, Europe, North America; Mt. Shasta.

Coriolus versicolor (L. ex Fr.) Quél. — On Cercocarpus ledifolius. — Old specimens were found on dead wood near Andesite Station on the north side of the mountain.

Cryptophorus volvatus (Pk.) Hubbard. — On Abies concolor. — In the Sierra Mixed Conifer zone along the Wagon Camp road.

On Abies magnifica var. shastensis. — Occasional on fallen logs and standing snags throughout the Shasta Fir zone.

On *Pinus ponderosa*. — A specimen collected by a ranger in Mt. Shasta in 1938 is filed at the Forest Pathology Collections, Beltsville, Maryland; found once on the north side of the mountain on a tree near timberline on the east side of Bolam Creek Canyon. Collection: 25703; Date: 26 Aug. 1949. Abundance: V, A. Associates: *Pinus lambertiana*, *Libocedrus decurrens*, *Pseudotsuga taxifolia*; *Pinus albicaulis*, *Abies magnifica* var. *shastensis*.

On *Pseudotsuga taxifolia*. — Found once by E. P. Meincke at Shasta Springs, 14 June 1926, according to a specimen filed at the Forest Pathology field office, San Francisco. Shasta fir trees in the Mountainhouse Creek devastated area appear able to survive the building up of gravel around their bases except when attacked by this species. Distribution: Siberia, Japan, North America; Mt. Shasta.

*Fomes amarus* (Hedgc.) Murr. — On *Libocedrus decurrens*. — Collected by G. C. Hedgecock at Sisson's, 2, 5 Oct. 1911, Specimen filed at Forest Pathology Collections, Beltsville, Maryland. — A specimen was obtained on a living tree along the Shasta-Lassen Highway (Cal. 89) five miles east of Pondosa in Shasta County. Collection: 25569. Date: 23 Aug. 1949. Abundance: IV, A. Associates: *Pinus ponderosa*, *Abies concolor*. Distribution: With the host in Oregon and California; Mt. Shasta.


*Fomes officinalis* (Fr.) Lloyd. — Observed on Shasta fir at about 7000 feet along the Sisson Southern Trail, on Sugar Pine along Squaw Valley Creek at about 5500 feet, and on mountain hemlock logs in the draw below Red Butte at 7500 feet. The rot symptoms of other dead wood indicate that the fungus is wider spread than its conks show.
Collections: 15513, 15540, 15764, 18005, 18283, 18410, 18411, 20406, 25570.

*Fomes pinicola* (Fr.) Cke. — While the rot caused by this species is fairly common, the conks appear infrequently and then usually in an atypical manner. On Shasta fir and mountain hemlock in the *Abies-Tsuga* zone.


*Fomes subroseus* (Weir) Overh. — Occasional on stumps and logs near Horse Camp on Shasta fir, 8000 feet.

*Fulvifomes juniperina* (Schrank) Murr. — On *Juniperus occidentalis*. — This host reaches the mountain at its north base although it forms large groves in the Shasta Valley to the north. A specimen collected in June 1938 was given to the University of California herbarium (539462) by Miss E. E. Morse. It is labeled as collected at Mount Shasta.

*Ganoderma applanatum* (Pers.) Pat. — On *Abies concolor*. — Several conks occurred on a prostrate log near the Squaw Valley Creek spring at 5000 feet.

*Ganoderma oregonense* Murr. — Found at the base of living trees and on dead stumps and rotting logs of Shasta fir in the Shasta fir zone between 7000 feet in Cascade Gulch and 8000 feet at Horse Camp and between Horse Camp and Panther Creek meadows. Collections: 7588, 8650, 10308, 16794, 18435, 27002, 28347. The largest specimen obtained measured $42 \times 35 \times 13$ cm. Also collected by Hedgcock apparently in the same area. Dates: 3 Oct. 1911; 9 Aug. 1936; 17 Aug. 1937, 10 Sept. 1938; 7 Sept. 1942; 4 Sept. 1946; 28 Sept. 1950; 4 July 1951. In June 1946 three large old specimens were observed on each of three dead Shasta firs on either falled logs or stumps. Abundance: III, A. Associates: *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. Distribution: Oregon, California; Mt. Shasta.

*Gloeophyllum sepiarium* (Schaeff. ex Fr.) Karst. — Fruit bodies were obtained from the sawed ends of piled logs of Shasta fir cleared from the Snowline Highway on sapwood seven
years after the trees were cut; on wood at Panther Creek meadows. Collections: 15530, 28282. Dates: 3 July 1941, 1 July 1951. Abundance: IV, A. Associate: Abies magnifica var. shastensis. Distribution: North temperate regions; Mt. Shasta.

Hirschioporus abietinus (Dicks. ex Fr.) Donk. — On Abies magnifica var. shastensis. — Common on bark and wood of dead saplings and trees near Horse Camp and throughout the Shasta Fir zone. This form on Shasta firs appears to be much more stunted and atypical in most years in growth than collections made in the Sierra Nevada to the south. Collections: 8529, 18049, 18352, 18438. Observed a number of times between 1936 and 1947 but material was usually too poor to collect. Collected by Hedgcock in the same general area. Dates: 3 Oct. 1911; 26 June 1937; 25 June, 10 Aug., 4 Sept. 1946. Abundance: III, A. Associate: Abies magnifica var. shastensis. Distribution: On conifers in the northern hemisphere; Mt. Shasta.

Laetiporus sulphureus (Bull. ex Fr.) Bond. & Sing. — On Abies magnifica var. shastensis. — One tree on a ridge between Panther Creek meadows and Horse Camp above the Snowline Highway at 7500 feet was found to have several young fruit bodies between the base and five feet above the ground. In June 1946 a massive fruit body of the previous fall was found on a dead tree near Horse Camp at 8000 feet. New growth of sporophores was initiated on this tree in late August and early September. A tree along the Snowline Highway at about 7000 feet was found to be bearing a large young conk in 1949. Collections: 16808, 18445, 25715. Dates: 8 Sept. 1942, 4 Sept. 1940, 26 Aug. 1949. Abundance: IV, A. Associates: The host. Distribution: Cosmopolitan; Mt. Shasta.


Poria asiatica Overh. — On rotting Shasta fir wood at Horse Camp, 8000 feet.


_Poria feruginosa_ (Schrad. ex Fr.) Karst. — On pieces of logs used as stools at Horse Camp, 8000 feet. Isolated from the rotten wood formed on such stools when they are in contact with the ground. Rotted areas in the case of these logs are covered with brown, felty, masses of mycelium. Similar masses of mycelium have been observed in other localities on the mountain. Isolations were made by Ross W. Davidson.


_Poria ?tenuis_ (Schw.) Cke. — On _Cercocarpus ledifolius_. — Material collected from several branches of a large shrub on the north
side of the mountain near Andesite Station is referred here tentatively by J. L. Lowe.


*Poria vaporaria* (Fr.) Cke. — On *Abies magnifica* var. *shastensis*, *Tsuga mertensiana*. — Collected once at Squaw Valley Creek and once along the Ski Trail below Horse Camp.


*Porodaedalea pini* (Thore ex Fr.) Murr. — The form of this fungus referred to as *Trametes pini* var. *abietis* Karst. has been found several times in fruit inside rotting logs of Shasta fir at and near Horse Camp.


*Spongipellis borealis* (Fr.) Pat. — Found once on *Abies concolor* along the Sisson Southern Trail at 6000 feet.


*Spongiporus leucospongia* (Cke. & Harkn.) Murr. — On *Abies concolor*, *Abies magnifica* var. *shastensis*, *Arctostaphylos patula*, *Pinus albicaulis*, *Tsuga mertensiana*. — This fungus occurs most commonly on rotting logs of Shasta fir. In an avalanche flat in the lower part of the Horse Camp Creek area most of the prostrate logs had fruit bodies of this species on them in one or more of the years between 1936 and 1947. The fruit bodies are apparently capable of reviving during periods of light rains which occur about once a month during the summer. Apparently they develop preceding or during the snow pack. On a stick, apparently of white bark pine, used as a mile post along the Summit Trail at about 9000 feet, above the limits of woody growth along this trail; this species fruited in 1939. The collection on green manzanita was made under ponderosa pines in the Sierra Mixed Conifer zone and the host stick was unmistakably of the manzanita.

Collections: on Shasta fir: 8568, 10116, 10126, 10134, 10171, 14633-A, 15537, 15545, 15563, 15573, 15643, 18022, 18436, 20106, 20122, 24041, 24057, 28259, Exs. 30-A. Collected once by Hedgcock on the southwest side of the mountain, apparently along the Sisson Southern Trail; on white fir: 10248, 16633, collected once at Sisson by Hedgcock; on white bark pine: 13355; on mountain hemlock: 15561, 15572, 18415, 28312; on green manzanita: 15520. Dates: 3, 6 Oct. 1941; 9 July 1937; 17, 20


**Agaricales.**

_Hygrophoraceae._

_Hygrophorus gliocyclus_ Fr. — Collected once in 1941 on Shasta fir duff and litter near melting snowbanks. Abundance: V, D. Associate: _Abies magnifica var. shastensis_. Distribution: Europe, California; Mt. Shasta.


_Hygrophorus vernalis_ A. H. Smith. — A large colony was found in 1941 on humus among procumbent shrubs of _Phylloclade empetrifomis_ under mountain hemlock in the Panther Creek heather meadows at about 8000 feet. In July 1948 it was again observed on hemlock-Shasta fir litter and duff in the same meadow. Collections: 15636, 24069. Dates: 50 specimens obtained 28 July 1941, abundant 4 July 1948. Abundance: IV, D. Associates: _Phylloclade empetrifomis_, _Tsuga mertensiana_, _Abies magnifica var. shastensis_. Distribution: Washington, Oregon; Mt. Shasta.

_Tricholomataceae._

_Armillaria mellea_ Fr. — Typical rhizomorphs have been observed in connection with frequent windfalls of Shasta fir and sugar pine. No fruit bodies have been observed on the mountain but Ranger Jack Reve a l, formerly of the Sacramento District, Shasta National Forest, sent the writer specimens taken from a garbage pit at the Mott yard of the Shasta National Forest at 3000 feet along the Highway between Mount Shasta and Dunsmuir. October 1947. Abundance: III, A. Associates: _Abies magnifica var. shastensis_, _Pinus_
lambertiana, Pseudotsuga taxifolia, Abies concolor. Distribution: Europe, Asia, Australia, North America; Mt. Shasta.


Clitocybe sp. — Several specimens were obtained in ponderosa pine woods near McCloud, 3500 ft. Collection: 19365. Date: 8 April 1947. Abundance: V, D. Associate: Pinus ponderosa.

Clitocybe sp. — A number of mounds were found in pine woods near McCloud. Upon opening them large clusters of up to 45 white mushrooms were found in them. Also found at Horse Camp and along the Sisson Southern Trail under Shasta firs. Collections: 19367, 20079, 20097. Dates: 8 April, 22 June 1947; 28 Sept. 1950. Abundance: IV, D. Associates: Pinus ponderosa; Abies magnifica var. shastensis.

Collybia sp. — Found on occasional Shasta fir stumps and logs near Horse Camp. Until 1947 it was usually found in dry condition for without irrigation from melting snow it dries up quickly.


On Pinus albicaulis. — Specimens have been found on prostrate logs on the ridge above Horse Camp in the White Bark Pine zone, and in the upper Squaw Valley Creek meadows in the upper Shasta Fir zone; the first at about 8500 feet and the second at 8000 feet. Specimens of decaying wood collected near the water supply spring above Horse Camp, 8250 feet, and in the South Gate, 8000 feet, contained mycelium of a rot caused by this fungus. The type of rot
observed throughout the White Bark Pine zone indicates that this species is probably wide spread on the mountain.


*Lentinus* sp. — Sessile specimens have been found on occasional logs of Shasta fir and mountain hemlock especially in the avalanche flat below Horse Camp and at Panther Creek meadows.

Collections: 14620, 14634, 15521, 15533, 15544, 15550, 15562, 18045, 18216, 24043, 24046, 24070, 25632, 28299, 28330, 28331. Dates: 3, 8 July 1940; 27 June, 9, 12, 14, 16, 28 July 1941; 23 June, 2, 10 July 1946; 3, 4 July 1948; 24 Aug. 1949; 2, 4 July 1951. Abundance: 111, A. Associates: *Abies magnifica* var. *shastensis, Tsuga mertensiana.*

On *Haplopappus bloomeri* var. *angustatus.* — Found only once on dead branches at Horse Camp, 8000 feet.


*Lycophyllum* sp. — Large colonies of this mushroom follow the snowbanks on Shasta fir duff and litter between 6500 and 8000 feet. The mushroom fruits as the snowbank melts away and as soon as the effects of this irrigation evaporate or percolate the mushroom dries up, disappearing within two weeks of its initiation.

Collections: Collected once in 1941, several times in 1946. Abundance: IV, D. Associate: *Abies magnifica* var. *shastensis.* Distribution: In timberline areas throughout the Cascade Mountains, the Blue, Wasatch and Medicine Bow Mountains.

*Melanoleuca* sp. — On collection, 19359, was made along the Mud Creek Dam road above McCloud. Date: 8 April 1947. Abundance: V, D. Associates: *Pinus ponderosa, Abies concolor, Libocedrus decurrens.*

*Mycena alcalina* (Fr.) Quél. — Twenty-two specimens were found once on a white fir log at the foot of the zig-zag on the Sisson Southern Trail, 5000 feet.


*Mycena gracilis* (Fr.) Quél. — Three specimens were found on ponderosa pine litter along the Mud Creek Dam road above McCloud.


*Mycena griseiconica* Kauffman. — Collected on rotten wood of *Libocedrus decurrens* and *Pinus ponderosa* along the Mud
Greek Dam road at about 4000 feet above McCloud, and near McCloud at about 3500 feet. 


*Mycena griseoviridis* A. H. Smith. — Found in nearly completely decayed piles of debris from Shasta fir and mountain hemlock logs and stumps just as the snow is melting throughout the Shasta Fir zone. Some specimens had pushed up through the snow, others were as much as five feet from the snow but well irrigated. The specimens disappear as soon as the water supplied by the melting snow is gone. Also found at the foot of the zig-zag on the Sisson Southern Trail at 5000 feet on rotten white fir wood.


*Mycena laevigata* (Lasch) Quél. — Five specimens were found on a rotten conifer log at the foot of the zig-zag on the Sisson Southern Trail, 5000 feet.


*Mycena lilacifolia* (Pk.) A. H. Smith. — Eighteen specimens were found on a ponderosa pine stump along the Mud Creek Dam road above McCloud at about 4000 feet. Also found in the Horse Camp area commonly on Shasta fir logs.


*Omphalina rustic* (Fr.) Quél. — Thirty-four specimens were found on sandy ground in ponderosa pine woods near McCloud, 3500 feet.


*Pleurotus petaloide* Bull. ex Fr. — Found once on a log of Shasta fir at Horse Camp.


*Tricholoma rhizoideum* A. H. Smith. — Collected once on Shasta fir duff and litter at about 7000 feet along the Sisson
Southern Trail. A large colony followed the exposure of the substratum by melting snow banks. As the substratum dried out the fruit bodies dried up and eventually disappeared.


Amanitaceae.

Amanita spp. — Specimens of what might have been Amanita phalloides Fr. occur occasionally on Shasta fir duff at about 7000 feet along the Sisson Southern Trail. In this area and throughout the Shasta fir forest another Amanita occurs occasionally. Identification has not been completed.

Amanitopsis vaginata Fr. — Occasional specimens have been observed on Shasta fir duff at about 7000 feet.

Pluteus cervinus Fr. — Found once in the meadow at Bear Springs, 5000 feet.

Agaricaceae.

Agaricus arvensis Fr. — One specimen was found under Shasta firs near shrubs of mountain manzanita on a ridge below Horse Camp at about 8000 feet.

Coprinaceae.

Coprinus comatus Fr. — Three mushrooms were found under some white bark pines on the knob above Horse Camp springs. They were long stemmed, most of the stem reaching into the soil below the duff under the pines, 8250 feet.

Psathyrella atrifolia (Pk.) Smith. — Six specimens were found scattered on the ground in the chaparral along the old Sisson Southern Trail, 4000 feet.
**Sirophariaceae.**

*Flammula graveolens* Pk. — Collected once on rotten Shasta fir wood at Horse Camp in 1941.

*Flammula penetrans* Pk. — Collected once in 1939 on Shasta fir wood near Horse Camp.

*Naematoloma fasciculare* (Fr.) Karst. — A cluster of mushrooms was found on humus at the base of a white fir at Wagon Camp.

*Pholiota trachyspora* Clements. — Found once in Shasta fir duff at 7000 feet in 1941.

*Stropharia sienna* Kauffman. — One specimen was found near a pine log along the Mud Creek Dam road above McCloud.

*Pholiota involuta.* — On a Shasta fir log near Panther Creek meadows, 7500 feet.

**Cortinariaceae.**

*Cortinarius* (nr. *C. aurifolius*) sp. — Specimens were collected along the Mud Creek Dam road above McCloud at about 4000 feet.

*Cortinarius cotoneus* Fr. — Collected once in 1942 on coniferous duff, near Horse Camp.

*Cortinarius heterosporus* Bres. — Nearly buried in soil under manzanitas along the old snowline road in the chaparral.
Cortinarius orichalceus Fr. — Probably nearly buried in the ground under manzanita but kicked out by some animal; in the chaparral along the old snowline road at about 4000 feet.

Nauoria sp. — Sixteen specimens were found on manzanita bark along the old Sisson Southern Trail between 4000—4500 feet.

Crepidotaceae.

Crepidotus sp. — Common on branches of Shasta fir in one grove near Horse Camp, 8000 feet, after an early September rain.

Rhodophyllaceae.

Rhodophyllus sp. — Eight specimens were found on duff in pine woods near McCloud, 3500 feet.

Paxillaceae.

Paxillus panuoides Fr. — Found on short lengths of Shasta fir logs used as stools in cabins with dirt floors and in cabin yards at Horse Camp, 8000 feet, just after the snow had melted. Also on a ponderosa pine board along the Mud Creek Dam road at about 4000 feet.

Boletaceae.

Boletus albidos ssp. eupachypus Konrad. — Collected occasionally throughout the Shasta Fir zone especially in the area between Cascade Gulch and Mud Creek Canyon. This species presents a subhypogaeous habit. It grows under the duff pushing up dry segments of the duff an litter as the fruiting bodies expand. Squirrels like it as, apparently do deer. In 1946 it was collected as low as 6000 feet in the White Fir zone and as high as 8000 feet in the Shasta Fir zone near Horse Camp. No mycorrhizal relationship has been established between this species and the firs near which it grows although such a relation is possible. The largest fruit bodies found were 17 cm. in diameter.
Collections: 10281, 10304, 14661, 15721, 18327, 18337, 18338, 18374, 20165, 20231, 20347, 20355, Exs. 203. Dates: 8, 10 Sept. 1938; 8 Aug. 1940;

Boletus frustosus Snell & Dick. — Collected in the same habitats as the above species. No animals appear to eat this species as is evident in the case of the above species. It is also, in open woods, subhypogaeous, although it has been found exposed on sandy open banks of Mud Creek Canyon.


Boletus miniato-olivaceous Frost. — Collected under white fir along the Wagon Camp Road above Bear Springs.


Suillus sp. — Near rotten wood of Shasta fir near Horse Camp, 8000 feet.


Russulaceae.

Russula delica Fr. — One specimen was found under Shasta fir duff along the Sisson Southern Trail at 7000 feet.


Gastromycetes.

Hymenogastrales.

The first three orders and some of the genera in other orders are hypogaeous in fruiting habit. Most of the collections on which these names were based were obtained within a mile of Horse Camp in the Shasta Fir zone. Most of the specimens were associated with Shasta fir wood, either being found buried deep inside of logs, or beside logs and rotting sticks buried in the ground. Some were found in the soil and the collections of these were more accidental than planned since there was little or no evidence before the soil was disturbed that fungi grew there. One or two specimens were found on stones or logs, obviously dug up by rodents and left to dry in the sun. The following numbers of hypogaeous specimens were collected in the indicated years: 1937: 5; 1938: 11; 1939: 26; 1940: 21; 1941: 17; 1942: 4.
Hydnangiaceae.


Hymenogastraceae.


Melanogastraceae.


Rhizopogonaceae.


**Gautieriales.**

**Gautieriales.**


**Hysterangiales.**

**Hysterangiales.**


**Lycoperdales.**

**Lycoperdales.**


**Calvatia craniiformis** (Schw.) Fr. — A sterile base assigned to this species was found under pines near timberline on the north side of the mountain. Collection: 25702. Date: 26 Aug. 1949. Abundance: V, D. Associates: *Pinus ponderosa*, *Pinus albicaulis*. Distribution: North America, Mt. Shasta.

**Calvatia fumosa** Zeller. — On the ground under Shasta firs and mountain hemlock, 7500—8500 feet. Collections: 15522, 15630, 15778, 16799, 18003, 18110, 18190, 18413, 20003, 20037, 20049, 20050, 20080, 20131, 20228, 20287, 20335, 28291. Dates: 27,

*Calvatia sculpta* Harkn. — Observed on or near rotting Shasta fir wood and on duff and litter in Shasta fir and white fir forests between Horse Camp and Wagon Camp.


*Calvatia subretacea* Zeller. — Occasional on litter in Shasta fir woods.


**Geastraceae.**

*Geastrum coronatum* (Schaeff.) Schroet. — Found on soil in a patch of chaparral in the Sierra Mixed Conifer zone at about 5500 feet.


*Geastrum mammosum* Pers. — On sandy soil in the chaparral along the old Sisson Southern Trail at about 4000 feet.


**Mycenastraceae.**

*Calbovista subsulcata* Morse. — On ground at Bear Springs, Wagon Camp and near Squaw Valley Creek just above McCloud, 4000–5700 feet. Reported by Miss Morse from Mount Shasta.


**Mesopheliaceae.**

*Abstoma reticulatum* Cunn. — One collection of this hypogaeous species was made near Horse Camp in Shasta fir duff.

**Sclerodermatales.**

*Astraeaceae.*

*Astraeus hygrometricus* (Pers.) Morg. — Sterile stellate exoperidia of a fungus corresponding to the exoperidia of this species have been collected in the Cascade Gulch area between 5000 and 7000 feet, and along the Sisson Southern Trail between 7000 and 7500 feet. Mature fruit bodies have been found along the Old Military Highway on the north side of the mountain.


*Astraeus pteridis* (Shear) Zeller. — Found along the Sisson Southern Trail at 4000 feet in the chaparral, and at 7000 feet in the Shasta fir zone.


*Scleroderma bovista* Fr. — In a garden at Mount Shasta, 3550 feet.


*Scleroderma cepa* Fr. — On the ground in a lawn at Mount Shasta, 3550 feet.


*Scleroderma hypogaeum* Zeller. — In a garden at Mount Shasta.

Sedeculaceae.

Sedecula pulvinata Zeller. — One collection was made of several specimens buried in the soil under Shasta fir duff in Cascade Gulch below Horse Camp in the Shasta Fir zone at about 7500 feet; one specimen was found on the floor of Mud Creek Canyon above Mud Creek Dam; one specimen was found near timberline on the north side of the mountain east of Bolam Creek at about 8500 feet. Collections: 10307, 14667, 25699. Dates: 10 Sept. 1938, 28 July 1940, 26 Aug. 1949. Abundance: IV, D. Associates: Abies magnifica var. shastensis; Abies concolor, Pseudotsuga taxifolia, Pinus ponderosa; Pinus albicaulis. Distribution: Known only from these collections.

Tulostomataceae.

Tulostoma tuberculatum White. — One collection of a half dozen specimens was made in a sandy hill along the Sisson Southern Trail just above the cut-off to the spring, Shasta Fir zone at about 6500 feet. Collection: 14614. Date: 18 June 1940. Abundance: V, D. Associates: Both species of Abies, Ceanothus velutinus. Distribution: British Columbia, Colorado, Mt. Shasta.

Nidulariales.

Nidulariaceae.

Crucibulum levis (DC.) Kambly & Lee. — One collection was made at Horse Camp of a number of specimens growing on bits of possibly Shasta fir wood in the turf area at the water system. Also found on wood of Pinus attenuata along the Mud Creek Dam road above McCloud. Collections: 15702, 19337, 19347. Dates: 8 Aug. 1941, 8 April 1947. Abundance: IV, A. Associates: Abies magnifica var. shastensis; Pinus attenuata, Libocedrus decurrens. Distribution: Cosmopolitan, Mt. Shasta.

Podaxales.

Secotiaceae.


Cyttarophyllum polytrichoides (Zeller) Singer. — Found during most years in the sod near the “well” of the Horse Camp spring. From there it has apparently migrated, possibly by
being carried in the water, to the small turf formed at the Shasta Alpine Lodge. There, rather than being scattered among the rush and grass plants, it was gregarious, more than 100 specimens having been collected at one time in each of two small patches. Two specimens were obtained once in wet sod along Squaw Valley Creek at 7800 feet. Collections: 8607, 13313, 13361, 14718, 15701, 15752, 18315, 20260, 20265, Exs. 136. Dates: Aug. 1936; 20 July 1937; 5, 20 July 1939; 8 Aug. 1940; 8, 24 Aug. 1941; 30 July 1946. Abundance: III, D. Associates: Juncus orthophyllus, Campanula wilkinsiana. Distribution: Known only from Mt. Shasta.


Montagnea arenaria (DC.) Zeller. — Twenty specimens were found in 1940 on a sandy hill along the lane leading from Andesite Station to the Military Pass. The conditions at this point are as near desert-like as can be found on the mountain. This area lies on the north side of the mountain. It was found again in 1941 in the same habitat.


Se cotium nubigenum Harkn. ex Zeller. — Frequent on rotten Shasta fir logs and on piles of brown remains of Shasta fir logs and stumps in the Shasta Fir zone. At one point near Horse Camp at 7800 feet where a number of Shasta fir logs have reached a very advanced stage of decay in a very large grove of trees, 30—40 specimens at a time have been obtained from logs from which the snow had just melted. In 1946 in a few square feet 85 specimens were found on duff, litter and logs. Frequently specimens are found on logs and rocks apparently set out to dry by squirrels. Occasionally near snow banks the specimens will penetrate through the snow or will flourish in hollows under the snow from which the snow has already melted.

Collections: 10163, 10174, 10182, 10209, 14605, 14610, 14618, 14646, 15534, 15542, 15552, 15528, 15561, 15572, 15640, 15649, 15664, 15759, 18004, 18026, 16798, 18148, 18215, 20066, 20133, 24044, 24067, 28241, 28290, 28315, 28346, 28317, 28341, Exs. 78, 78-A. Dates: 29 June, 1, 6, 15 July 1938; 10, 14 June, 3, 8 July 1940; 3, 9, 12, 14, 16, 18, 26, 29 July, 7, 28 Aug. 1941; 7 Sept. 1942; 19, 23 June, 2, 10 July 1946; 22, 25 June 1947; 3, 4 July

Secotium pingue Zeller. — Collected once in a rotten Shasta fir log near Horse Camp.

**Fungi Imperfecti.**

**Phomales.**

**Phomaceae.**


**Ascochyta pisi** Lib. — A heavy infection associated with Uromyces fabae was found in 1941 on Lathyrus lanzswertii var. aridus at MacBride Springs, 5000 ft. Exs. 140. Abundance: V, C. Associates: Purshia tridentata, Ceanothus velutinus, Arctostaphylos patula.

**Botryosphaerostroma visci** (Sollm.) Petrak. — On Phoradendron libocedri. — On fallen branches of the host under incense cedars along the Mud Creek Dam road above McCloud, 4000 feet. Collection: 19351. Date: 8 April 1947. Abundance: V, C. Associates: Libocedrus decurrens, Pinus ponderosa, Abies concolor.

**Coniothyrium fuckelii** Sacc. — Isolated from soils as indicated in the table.


**Darluc a filum** (Biv.) Cast. — Associated with the following rusts: Puccinia rubigo-vera on Holcus lanatus along an irrigation ditch near Mount Shasta, 3500 feet, June 1941. — Uromyces fabae on Lathyrus lanzswertii var. aridus at MacBride Springs, 5000 feet, 1941. — Puccinia atrofusca on Carex whitneyi along the Shasta Snowline Highway at about 5500 feet. Abundance: IV, F. Distribution: Europe, Africa, Ceylon, North America; Mt. Shasta.

**Diplodia lupini** Cke. & Harkness. — On Lupinus obtusi-lobus. — On occasional leaves on plants found between 7000—8000 feet on the north side of the mountain.
Collection: 25692. Date: 26 Aug. 1949. Abundance: V, C. Associates:
Pinus ponderosa, Abies magnifica var. shastensis. Distribution: California, Mt. Shasta.

Diplodia veratri Earle. — On Veratrum californicum. — On rotting stems on swampy ground along Squaw Valley Creek in Shasta fir woods at about 7500 feet.

Diplodia silene W. B. Cke. — On Silene douglasii var. douglasii. — On the north side of the mountain east of Bolam Creek on smutted plants.

Dothiorella magnifructa (Pk.) Petrak & Sydow. — On Libocedrus decurrens. — On cones on the ground under trees along the Mud Creek Dam road.


Hendersonia spp. — Collected on overwintered leaves of Agrostis thurberiana and on overwintered stems and sheaths of Veratrum californicum.

Kellermannia alpina Ell. & Ev. — See Heteropatella umbilicata.

Macrophoma chrysothamnii W. B. Cke. — On Chrysothamnus nauseosus var. occidentalis. — Along a lane above Bolam Station at about 5500 feet.

Macrophoma cylindrospora (Desm.) Berk. & Vogl. — See Lophodermium phloxii Bonar & W. B. Cke.

Naemophora shastensis Sprague & W. B. Cke. — On Streptanthus orbiculatus. — Collected on a number of overwintered stems of this annual host at the lower part of the Horse Camp spring area. Unless the host plant occurred near or in running water this species was not found on it. On the south wall of Cascade Gulch at about 9000 feet in the White Bark Pine zone on open talus slopes most overwintered portions of this herb were found covered with this fungus in 1947.
Collections: 8542, 8578, 8589, 20481, 28303, Exs. 277. Dates: 29 June,
12, 20 July 1937; 28 August 1947; 2 July 1951. Abundance: IV, C. Associates: *Mimulus tilingii, Luzula subcongesta; Eriogonum marifolium, Polygonum shastense, Pinus albicaulis*. Distribution: Known only from these collections.

*Phoma caricis* (Fr.) Sacc. — On *Carex breweri*. — On dead leaves around base of widely scattered clumps on ridge north of Horse Camp at about 10,000 feet.
Collection: 18248. Date: 16 July 1946. Abundance: V, C. Distribution:

*Phoma eriogoni* W. B. Cke. — On *Eriogonum marifolium*. — On occasional plants in South Gate, 8000 feet.

*Phoma harknessii* Sacc. — Collected once on dead pieces of wood of *Pinus albicaulis*. Abundance: V, C. Associate: The host. Distribution: California; Mt. Shasta.

*Phoma herbarum* Westd. — This species occurred on overwintering remains of *Castilleja arachnoidea var. shastense* collected at Horse Camp in 1937 and 1946. In 1946 it was also found on *Carex breweri* at 9000 feet in Cascade Gulch and at 9500 feet on ridges north of Horse Camp, as well as on *Juncus parryi* at Horse Camp at 8000 feet.

*Phoma herbicola* Wehmeyer. — On *Carex breweri*. — On dead leaves around plants on a ridge north of Horse Camp.

*Phoma spp.* — On *Castilleja arachnoidae var. shastense, Arnica viscosa, Lupinus albicaulis var. shastensis*. — In the Horse Camp area at timberline, 8000 feet, and in Shasta fir forest along the Horse Camp-Wagon Camp trail, 7500 feet.

*Phoma sp.* — On Shasta fir bark on a tree along the Sisson Southern Trail at 7500 feet.
Collection: 18355. Date: 10 Aug. 1946. Abundance: V, A.

*Phyllosticta amicta* Ell. & Ev. — On *Arctostaphylos nevadensis* Gray. — Forming spots on parts or all of 182 out of 500 of the small sclerophyllous leaves on a branch of this shrub along the Sisson Southern Trail about a half mile below Horse Camp; and on a ridge between Horse Camp and Wagon Camp.


**Phyllosticta ferox** Ell. & Ev. — On Lupinus albicaulis var. shastensis. — Covering all leaves of entire plants or only a few leaves of individual plants in a colony of the host along the Sisson Southern Trail near the upper end of the Horse Camp-Wagon Camp Trail. Also in a Shasta fir forest between Horse Camp and Panther Creek meadows. Collections: 13405, 20443, Exs. 52. Dates: 22 Aug. 1939, 15 Aug. 1946. Abundance: III, C. Associate: Abies magnifica var. shastensis. Distribution: On more than 4 species of Lupinus in western North America; Mt. Shasta.


Selenophoma donacis Sprague & A. G. Johnson. — This species occurs occasionally on a few or most of the leaves on clumps of Elymus glaucus, Elymus hansenii and Elymus elymoides. It has been found between 5000 and 9000 feet on the mountain. It is commonest on Elymus elymoides and is found frequently at Horse Camp (8000 feet) on most of the clumps of this species in most years. Collections: 18256, 18257 (and other years). Dates: 16 July 1946 and most years. Abundance: III, C. Associates: Abies magnifica var. shastensis, Abies concolor, Pinus ponderosa, Pinus albicaulis, Libocedrus decurrens. Distribution: Western North America; Mt. Shasta.


Septoria curvispora Ell. & Ev. — On Acer glabrum. — Collected on leaves of this host by W. C. Blasdale, Aug. 1894, and distributed in Ellis and Everhart: Fungi Columbiani No. 773. Also issued as No. 3270 in North American Fungi where it was cited as a variety of S. circinata Ell. & Ev.


Septoria marginata Heald & Wolf. — On Acer glabrum. — Occasional in one year on a tangle of host trees along Squaw Valley Creek at about 5500 feet in the Sierra Mixed Conifer zone. This species is considered synonymous with S. aceris (Lib.) Berk. & Br. by Gilmen and Archer. Collection: 14678, Exs. 75. Date: 8 Aug. 1940. Abundance: IV, B. Associates: Pinus ponderosa, Pinus lambertiana, Abies concolor, Pseudotsuga taxifolia. Distribution: Western North America; Mt. Shasta.


Septoria nodorum (Berk.) Berk. — On Melica californica. — The Ascochyta stage of this species was common on this grass around Wagon Camp meadows. Collection: 20432, Exs. 279. Date: 15 Aug. 1947. Abundance: IV, C. Associates: Stipa occidentalis, Elymus hansenii, both species of Abies. Distribution: Cosmopolitan with the hosts; Mt. Shasta.


Septoria shastensis Bonar & W. B. Cke. — On Aster shastensis. — A colony of this host along the Snowline Highway in the chaparral was completely covered by this species — leaves, petioles, stems, were completely infected.


*Septoriella* sp. — One collection of overwintered remains of *Lupinus obtusilobus* had on it a few fruit bodies of a fungus referred to this genus.


*Stagonospora* sp. — Found once on chips of Shasta fir in the Horse Camp woodpile.


*Sphaeropsis microscopicum* Tassi. — Collected once at Horse Camp in 1937 on overwintered remains of *Castilleja arachnoidea* var. shastensis.

**Excipulaceae.**


*Heteropatella umbilicata* (Pers.) Jaap. — On Agoseris gracilens, Aster shastensis, Castilleja arachnoidea var. shastensis, Castilleja miniata, Juncus sp., Ligusticum grayi, Monardella odoratissima, Pentstemon gracilentus. — Sometimes alone and sometimes in association with various species of *Leptosphaeria* and *Pleospora*, among others, this species occurs on overwintered herbage as described under *Leptosphaeria*. While the Kellermannia alpina stage is common, the ascigerous stage (*Heterosphaeria*) has not yet been obtained.

Sir excipula wyomingensis Wehm. — On Arabis platysperma, Saxifraga tolmiei. — On the former host in open places, on colonies of the latter in niches of lava rocks on the west side of Shastina between 9000 and 9500 feet in the upper White Bark Pine zone.


Leptostromataceae.

Leptostromella hysterioides f. graminicolum (de Not.) Sacc. — On Elymus elymoides. — On dead leaves around a clump along the ridges north of Horse Camp at about 9500 feet.


Thyrenula sp. — On fallen needles of Pinus attenuata at McCloud Summit on the south flank of Mt. Shasta at 4000 feet along State Route 89.


Nectrioidaceae.

Nectriella sp. — On Castilleja arachnoidea var. shastensis. — Collected once at Horse Camp on overwintered herbage.


Ollula pezizoidea Lév. — Collected once at Horse Camp on two dead twigs of Shasta fir.


Melanconiales.

Melanconiaceae.

Cryptostictis arbuti (Bonar) Zeller. — Occasional on Arctostaphylos patula in the chaparral and infrequent on Arctostaphylos nevadensis in the Shasta Fir zone.


Cylindrosporium rhamni Ell. & Ev. — The type was collected on leaves of Rhamnus sp. at Shasta Springs by W. C. Blissdale, No. 283, possibly in Aug. 1894.

Cylindrosporium smilacinae Ell. & Ev. — On Smilacina stellata. — Found only once at Wagon Camp and then blackening leaves on a large colony.

Collection: 20315. Date: 18 July 1947. Abundance: IV, C. Associates:

Cylindrosporium veratrinum Sacc. & Wint. — On Veratrum californicum. — Collected only once at Wagon Camp at a time when it caused a heavy infection blackening many leaves in a large colony. It may have been passed up in other years when heavy insect infestations occurred on these plants; also on leaves of plants in the lower part of Panther Creek Meadows. Collections: 20320, 25639. Dates: 18 July 1947, 25 Aug. 1949. Abundance: IV, C. Associates: Libocedrus decurrens, Smilacina stellata, Abies magnifica var. shastensis, Allium validum. Distribution: Switzerland, Mt. Shasta.

Gloeosporium pteridis Harkn. — On Pteridium aquilinum var. pubescens. — Found on a number of fronds in the Wagon Camp area at 5700 feet, as well as in the chaparral near Howard at 4200 feet and in the chaparral above McCloud on the south side of the mountain at 4000 feet. The perfect state was found once at Wagon Camp (see Cryptomycina pteridis). Collections: 10258, 13547, 18278, 20430, Exs. 29. Dates: 29 July 1938; 21 July 1939, 27 July 1946; 15 Aug. 1947. Abundance: III, C. Associates: Arctostaphylos patula, Ceanothus velutinus. Distribution: North America, Mt. Shasta.

Marssonina potentillae (Desm.) Magn. — On Potentilla glandulosa ssp. nevadensis. — Where the host occurs along streams this species is found occasionally on it. It was collected once at a small spring above Wagon Camp and has been found occasionally at MacBride Springs. Collections: 14625, 15607, 20225, Exs. 124. Dates: 5 July 1940, 25 July 1941, 3 July 1947. Abundance: IV, C. Associates: Abies magnifica var. shastensis; Libocedrus decurrens, Pinus ponderosa. Distribution: Western North America, Mt. Shasta.


Moniliales.
Moniliaceae.

Botrytis cinerea Pers. ex Fr. — On Veratrum californicum Durand. — Appearing as gray masses on dead stems at Panther Creek Meadows.


Cephalosporium sp. — Isolated from soil samples.

Chromosporium sp. — Pink pustules were found on dead leaves of Cryptogramma acrostichoides. Collected once, observed several times.


Diplocladium majus Bon. — On Armillaria zelleri. — Several specimens in the colony of the host reported above were infected with this mold.


Oidium mangisporum Linder. — Collected once on rotten Shasta fir wood at Horse Camp. — Abundance: V, A. Associate: The host. Distribution: Known only from this collection.

Ovularia lotophaga Ell. & Ev. — On Lotus torreyi. — The type of this species was collected at Sisson, July 1894, by W. C. Blasdale, No. 288.

Ramularia delphinii Jaap. — On Delphinium pauciflorum. — Collected once on several plants in the dry woodland below Wagon Camp. Not observed since the first collection was made.


Ramularia mimuli Ell. & Ev. — On Mimulus tilingii. — A large collection was made of plants rather completely covered with this pathogen in a spring above Horse Camp. Also found in Panther Creek meadows. Infected colonies are different from the healthy colonies in size and color. On some leaves pycnidial initials may be indicated by hyphal knots present.


Ramularia obdusculus Thüm. — On Pedicularis densiflora. — Collected along a roadside in Mount Shasta. This is the type locality and it is possible that the type collection was made from plants near the one producing this collection. More than 20 leaves were infected.

R a m u l a r i a n i v o s a (Eil. & Ev.) W. B. Cke. & C. G. Shaw. — On Pentstemon shastensis. — Found on most of the leaves of several host plants at Wagon Camp.

R a m u l a r i a c l a y t o n i a e W. B. Cke. — On Claytonia siberica. — Found once on a few plants near the Big Springs in the McCloud River southeast of McCloud, about 3500 feet.
Collection: 18279. Date: 25 July 1946. Abundance: V, C. Associate: Pinus ponderosa. Distribution: Known only from this collection.

R a m u l a r i a s e n e c i o n i s var. c a r n i o l i c a Jaap. — On Senecio aronicioides. — Although this species occurs at most of the localities on the mountain in which the host occurs it is most common at the bottom of the zig-zag on the Sisson Southern Trail. It has also been found in the small meadow between Gray Butte and Red Butte, at Wagon Camp, along the Wagon Camp Road, etc. Infected leaves dry up and disappear before the pycnidium-like knots of hyphae in the lesions have matured.

R a m u l a r i a t u l a s n e i Sacc. — On Fragaria californica. — Occasional at Wagon Camp, 5700 feet.

S e p e d o n i u m c h r y s o s p e r m u m (Bull.) Fr. — Collected once on rotten Shasta fir wood at Horse Camp. Abundance: V, A. Associate: The host. Distribution: Siberia, Europe, North America; Mt. Shasta.

S p o r o t r i c h u m sp. — Isolated from soil samples.

T i t a e a sp. — Collected once on overwintered herbage of Arnica viscosa above Horse Camp.

T r i c h o d e r m a v i r i d e Lk. ex Fr. — On Abies magnifica var. shastensis, Arctostaphylos patula, Quercus chrysolepis. — On dead wood of these hosts and isolated from soil Shasta fir woods and the summit of Shastina.

*Trichothecium roseum* Lk. — Pink specimens turning yellow on drying and purple in KOH were collected on *Pinus albicaulis* wood, on Shasta fir bark, spread over soil and stones near bark, near Horse Camp, 8000 feet.


*Verticillium terrestre* (Lk.) Lindau. — Isolated from soil samples.

*Dehiaeae.*

*Brachysporium oosporum* (Cke.) Sacc. — On *Sambucus racemosa* L. — Forming a black mat on dead canes, south side of Red Butte.


*Chloridium* sp. — Obtained from rotting wood of Shasta fir near Horse Camp.

Collections: 10077, 18077. Date: 27 June 1946. Abundance: V, A.

*Cladosporium herbarum* Pers. ex Fr. — Collected commonly on the overwintered herbage of most of the plants growing in the vicinity of Horse Camp. Also on *Melica californica* at Wagon Camp, on *Carex fracta* at MacBride Springs, and on *Elymus elymoides* on the north side of the mountain. On a slice of bread left at the 3-Mile post on the Summit Trail at about 13,000 feet. On rind of orange discarded near the 3-mile post along the Summit Trail at 13,000 feet. At this elevation whatever life exists must probably endure daily alternate freezing and thawing throughout the year. On pieces of cloth at Horse Camp and on a piece of cloth at the summit of the mountain. Material at Horse Camp grew on mildewed cloth kept in storage in a wet place for several years, 8000 feet. The piece of cloth at the summit, 14,161 feet was exposed to daily freezing and thawing throughout the year for about 8 years.

Collections: A number of collections and soil isolations in all years collections were made. Also 18,000-A, 18343, 18344, 18346. Dates: All years, 15 June, 6 Aug. 1946. Abundance: II, A, C, D. Associates: All materials over the mountain. Distribution: Cosmopolitan; Mt. Shasta.

*Curvularia inaequalis* (Shear) Boedijn. — Isolated from soil samples.

*Dendryphium* sp. — Collected once on overwintered herbage of *Poa pratensis* at Bear Springs.
Dendryphium pini v. Hoehn. — On bark of Shasta fir at Horse Camp.


Epochnium isthmomorphum Sacc. — On Chrysothamnus nauseosus var. occidentalis. — Several branches of one shrub on the lava flow terminating at MacBride Springs were completely blackened, and apparently killed, by this species.


Helminthosporium vagans Drechsler. — On Poa pratensis. — Collected once on a number of leaves of clumps of the host near seepage from the fountain, around the Lodge, and in turf at the water system at Horse Camp, 8000 feet.


Heterosporium allii Ell. & Martin. — On Tritelia ixoides var. analina. — Several leaves on a host colony below Wagon Camp were infected.


On Allium validum. — On overwintered herbage in Panther Creek Meadows.


Heterosporium asperatum Massee. — On Smilacina stellata. — Occurring with Cylindrosporium smilacinae on infected leaves of a large host colony at Wagon Camp.


Macrosporium puccinioides Ell. & Anderss. — On Lathyrus lanzswertii var. aridus. — Associated with Uromyces fabae on at least some leaves of a large diseased colony at MacBride Springs, 5000 feet.


Peyronelia sirodesmoides Cif. & Cav. — On Holodiscus discolor var. glabrescens. — On a dead branch lying on the ground on ridge above Horse Camp at about 9000 feet.

*Polythrincium trifolii* Kze. — See *Dothidella trifolii* (Pers. ex Fr.) Bayl.-Ell. & Stan.

*Scolecotrichum graminis* (Pers.) Fckl. — Occasional collections of grasses from most parts of the southwest slopes of the mountain between 4500 and 5500 feet included this species. The infected grasses include: *Bromus marginatus*, *Elymus glaucus*, *Glyceria elata*, *Melica aristata*, *Elymus hansenii* and *Stipa occidentalis*; on *Elymus elymoides* at about 8000 feet on the north side of the mountain. Abundance: III, C. Distribution: On many grasses in Europe, North America; Mt. Shasta.

*Stemphyllum consortiale* (Thuem.) Groves & Skolko. — Obtained in cultures made from specimens of cloth on which *Cladosporium* was the only observed fruiting fungus. The isolations were made at the Biological Laboratories, Philadelphia Quartermaster Depot, by the late W. Lawrence White and his staff.

*Stemphyllum* sp. — Following the winter on intact fruit heads of *Monardella odoratissima* material assigned here formed a partial black mat. It was found only once at Horse Camp although it was looked for after each snow pack melted.

*Torula? crustacea?* Schw. — Forming a black covering on the stems of a number of branches of *Salix scouleriana* near the Sisson Southern Trail spring.


*Stilbacaeae.*

*Arthrobotryum spongiosum* Hoerl. — Sterile material probably assignable to this species was found on young trees of *Libocedrus decurrens* at MacBride Springs.


*Stilbum tomentosum* var. *ovalisporum* A. L. Smith. — Collected several times on rotten Shasta fir wood in the vicinity of Horse Camp; and on mountain hemlock along Squaw Valley Creek.


*Tuberculariaceae.*

*Arthrinium cuspidatum* (Cke. & Harkn.) v. Hoehn. — Forming black spots on dead culms of *Juncus balticus* var. *montanus* and on dead leaves of *Carex* sp. at Horse Camp, 8000 feet.

*Exosporium pedunculatum* (Ell. & Ev.) W. B. Cke. — On *Sambucus glauca*us. — Pustules were produced from lenticels and cracks in bark on several branches on a shrub at MacBride Springs, 5000 feet.


*Cylindrocolla* sp. — Collected on Shasta fir wood and boards at Horse Camp. This grows in the form of gelatinous orange hemispheres on the substratum. It was associated with *Guepiniopsis alpina* and may prove to be its imperfect or oidial stage.


**Sporobolomysetaceae.**

*Sporobolomyces roseus* Kluyver & Van Neil. — Isolated as a result of attempting to culture spores of *Entyloma compositarum* on *Hieracium cynoglossoides* var. *nudicaule* by George Nyland in the spring of 1948.


*Mycelia Sterilia.*

*Rhizomorpha subcorticalis.* — *Rhizomorpha subterranea.* — Found occasionally in association with roots and bark of newly fallen trees and on wood of trees blown over or fallen several years before being observed. In all zones below the White Bark Pine zone. See *Armillaria mellea*.

In addition several types of sterile mycelia and sclerotia have been found. White sterile mycelium was found parasitizing a small agaric; brown sterile hyphae were found forming a mat of White Bark Pine needles in litter under trees at Horse Camp. Pycnosclerotia have been found associated with *Scolecochrichum graminis* infections on *Melica aristata*, and similar atrosclerotic masses of tissue have been found in connection with *Ramularia* infections on several hosts and with *Cylindrosporum smilacinae* on *Smilacina stellata*.

Using cultures derived from single ascospores from Mt. Shasta collections of *Clathrospora diplospora* (Ell. & Ev.) Wehm., *Clathrospora elynae* Rab., and *Leptosphaeria heterospora* (de Not.) Niessl., Simmons (23) obtained cultures assignable to the form species *Alternaria tenuis* Nees. Morphologically, then, this species is very variable including the imperfect state of many perfect fungi.