tanas and, in addition, she commented on the similarity of her collection to that species. The microscopic characters of the holotype of *B. eastwoodiae* are the same as those of basidiocarps of *B. satanas*. The spore sizes are in the same range; the cystidia are similar, and both have the same type of tangled trichodermium. Singer (2), in a brief note on *B. eastwoodiae,* stated that its spores were larger than those of *B. satanas* and also mentioned other minor differences. He did not, however, indicate whether his data were taken from the holotype of *B. eastwoodiae,* a matter of considerable importance as is indicated below.

Even though the holotype of *B. eastwoodiae* is a basidiocarp of *B. satanas,* for some inexplicable reason many on the west coast have erroneously assigned the name of *B. eastwoodiae* to a completely different bolete. This is the species described by Thiers (4) as *B. eastwoodiae* in his manual on the boletes of California, and is also the fungus pictured as *B. eastwoodiae* in recent popular works (1, 3) on western and North American fleshy fungi. It is apparently a new species and a description is given below. We regret the necessity of having to reduce *B. eastwoodiae* to synonymy with *B. satanas,* but there is no way it can be avoided.

Boletus pulcherrimus Thiers & Halling, sp. nov.[1] FIG. 2

Pileus 8–20 cm latus, convexus demum plano-convexus vel planus, siccus, glaber vel subtomentosus, aetate immutabilis vel appresso-fibrillosus, brunneus vel rufo-brunneus. Contextus 2–4 cm crassus, flavus, caerulescens. Sapor et odor mites. Tubuli 0.5–1 cm longi, flavi, caerulescentes; pori rubidi, caerulescentes. Stipes 7–18 cm longus, 2–5 cm crassus, clavatus vel subaequalis vel subbulbosus, siccus, reticulatus, pallide rufo-brunneus; reticulum rubidum. Sporae 13–16 × 5.5–6.5 μm, subellipsoideae vel subfusoideae, leves. Cystidia 33–60 × 8–12 μm, ochracea in KOH, fusoideo-ventricosa vel subclavata. Hyphae cuticulae intertextae, punctatae. Solitarius vel gregarius in silvis litoralibus. Holotypus: prope Jackson State Forest, Mendocino Co., California, Nov. 17, 1963, H. D. Thiers 10677 (SFSU).

Pileus 8–20 cm broad, convex when young becoming broadly convex to plano-convex to plane to somewhat irregular in outline with age; surface moist to dry, glabrous to subtomentose to sometimes slightly velutinous when young, unchanging or becoming obscurely appressed fibrillose with age, often when very old somewhat areolate to rimose-areolate and obscurely fibrillose scaly; color when young reddish brown ("deep olive buff" to "buffy brown"), usually with distinct reddish tones, particularly near the margin, unchanging with age or darkening somewhat, frequently with the fibrillose scales developing grayish tips; margin entire, incurved becoming decurved to plane with age. Context 2–4 cm thick, bright yellow ("picric yellow" to "Naples yellow" to near

[1] Color names in quotations from Ridgway, R. Color standards and color nomenclature.

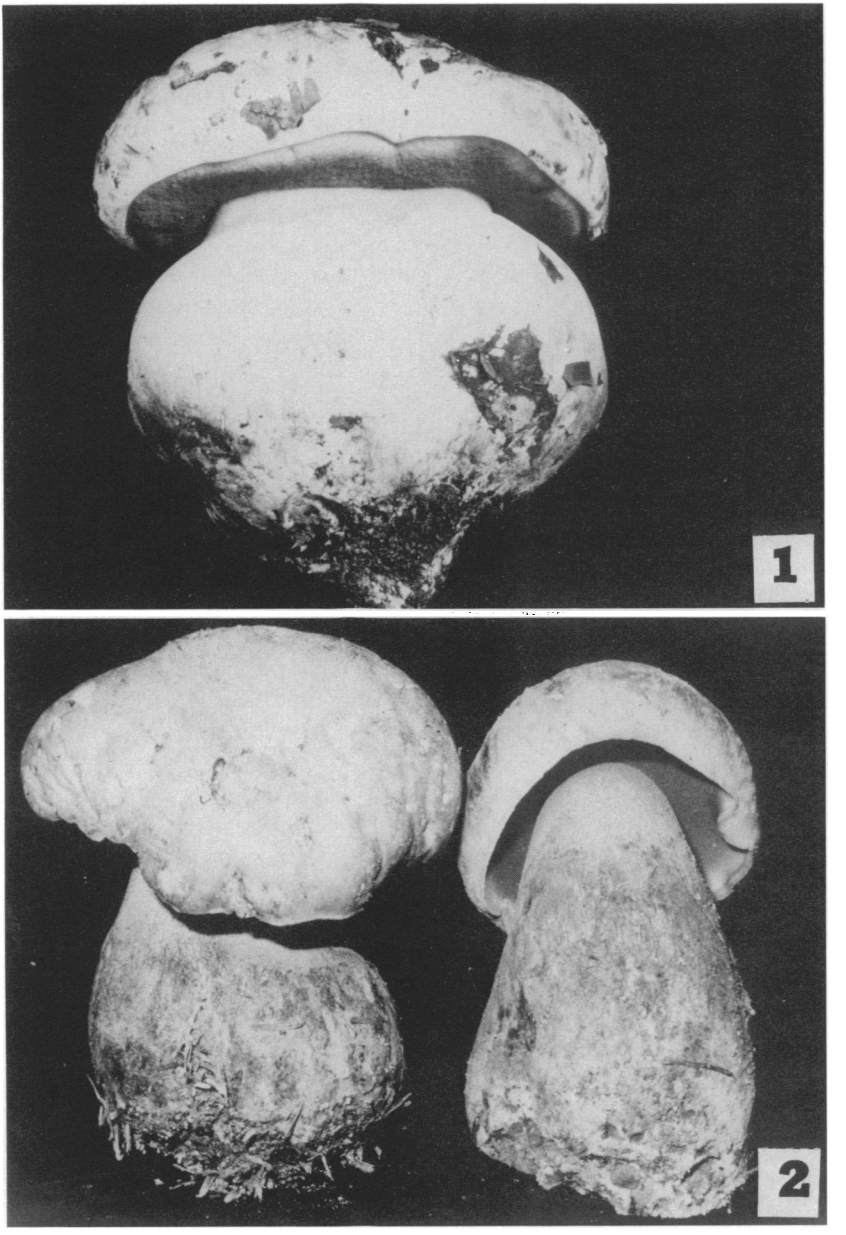

FIG. 1. *Boletus satanas.* One-quarter natural size.

FIG. 2. *Boletus pulcherrimus.* One-quarter natural size.

"naphthalene yellow"), changing to blue when first exposed then often fading to pale bluish yellow. Taste and odor mild.

Tubes 0.5–1.5 cm long, adnate to adnexed when young usually becoming depressed with age, yellow ("naphthalene yellow" to "barium yellow"), changing to blue immediately upon exposure; pores up to 1 mm in diam, angular, when young dark red ("ox-blood red" to "maroon") changing to reddish brown ("garnet brown" to "nopal red" to "Pompeian red" to "dragons blood red") with age, often yellow near the margin, bluing when bruised.

Stipe 7–16 cm long, 2–5 cm thick at the apex, up to 10 cm thick at the base, clavate to clavate-bulbous but not abruptly bulbous as in *B. satanas*, sometimes equal, especially when young, solid; surface dry, noticeably reticulate at least over upper two-thirds of the surface, background color pale reddish brown ("apricot buff" to "rufous" to as pale as "warm buff"), reticulations dark red ("Pompeian red" to "dragons blood red" to "Eugenia red"), base often staining brown ("chestnut brown"), bluing elsewhere when bruised. Context yellow, bluing when exposed.

Spores brown in mass, 13–16 × 5.5–6.5 μm, smooth, moderately thick-walled, ochraceous in KOH, not dextrinoid, subellipsoid to subfusoid. Basidia clavate, 1–4-spored, 35–40 × 9–12 μm. Hymenium amyloid when first mounted in Melzer's. Hymenial cystidia 33–60 × 8–12 μm, scattered, hyaline to ochraceous in KOH, fusoid-ventricose to subclavate to basidioid. Tube trama divergent from distinct central strand. Pileus trama interwoven, homogeneous. Pileus cuticle differentiated as a trichodermium of tangled hyphae with noticeably roughened walls, ochraceous in KOH. Clamp connections absent.

Chemical reactions. KOH: context pale yellow; HCl: context and cuticle pink; HNO_3: context and cuticle pink; sulfoformalin: context and cuticle pink; $FeSO_4$: cuticle gray.

Habit, habitat and distribution.—Solitary to gregarious in humus under mixed woods. Distributed throughout the coastal forests of northern California and extending into Oregon and Washington.

Material studied.—California. Lake Co.: Dusatko, fall, 1962. Mendocino Co.: Thiers 9431, 10591, 10677 (Type), 21318, 21421, 21501, 21659, 24490, 26999, 30411, 30418, 30434, 33171, 35536. Sonoma Co.: Dusatko, fall, 1962. (SFSU). Washington. Klickitat Co.: Puget Sound Myc. Soc., Oct. 9, 1967 (WTU).

Discussion.—As previously indicated this is the bolete which has been erroneously identified as *B. eastwoodiae* in northern California. *Boletus*

pulcherrimus is readily distinguished from *B. satanas* and all other red-pored boletes by the dark reddish brown, tomentose to fibrillose pileus, the dark red colored pores, and the clavate to subbulbous stipe which is colored pale reddish brown and has dark red reticulations on the surface. Microscopically *B. pulcherrimus* is further distinguished by having a trichodermium in which the hyphal walls are noticeably roughened and by having spores up to 16 μm in length and to 6.5 μm in width. It should also be noted that in California *B. satanas* seems to form mycorrhizal associations exclusively with coastal live oaks (*Quercus agrifolia*) in the coastal forests and with various other oaks such as California black oak (*Quercus kelloggii* Newb.) canyon oak (*Quercus chrysolepis* Liebm.) or interior live oak (*Quercus wislizenii* A. DC.) in the foothills and Sierra Nevada. *Boletus pulcherrimus,* on the other hand, has never been found associated with any oak and has only been found in mixed forests composed largely of tanbark oaks (*Lithocarpus densiflora* (H. & A.) Rehd.), Douglas fir (*Pseudotsuga menziesii* (Mirb.) Franco) and giant fir (*Abies grandis* (Dougl.) Lindl.)

As mentioned earlier a third member of this complex of red-pored boletes has been found, often abundantly, in the Sierra Nevada at elevations from 5,000 to 7,500 feet. This third species is obviously distinct from both *B. pulcherrimus* and *B. satanas* but is perhaps closer in appearance to *B. satanas.* A description of this species is given below.

Boletus haematinus Halling, sp. nov.[2] FIG. 3

Pileus 11–16 cm latus, convexus demum late convexus, siccus, glaber demum fibrillosus vel rimoso-areolatus, cervinus vel fuscus, saepe rufotinctus. Contextus 3–6 cm crassus, flavus, caerulescens. Sapor et odor mites. Tubuli 1–1.5 cm longi, flavi, caerulescentes; pori primo flavi deinde rosei demum haematini sed ad marginem pilei constanter flavi, caerulescentes. Stipes 5–11 cm longus, 4.5–7 cm latus, aequalis vel interdum clavatus vel subbulbosus, siccus, reticulatus, e flavo subflavidus vel albidus. Sporae 12–15 × 6–7.5 μm, ellipsoideae vel subfusiformes, leves. Cystidia 40–45 × 7.5–9 μm, rara, obclavata vel ventricoso-rostrata. Hyphae cuticulate intertextae spiraliter incrustate, punctatae. Gregarius vel sparsus sub arboribus coniferis montium. Holotypus: prope Yuba Pass, Sierra Co., California, Sept. 20, 1975, Halling 812 (SFSU).

Pileus (6–) 11–16 (–25) cm broad, spherical to convex when young, becoming pulvinate to plano-convex in age, irregular in outline; surface dry, often undulating and pitted, glabrous when young soon becoming appressed fibrillose and rimose-areolate in aged specimens; color during all stages light brown ("dark blonde" to "clay" to "oak brown"), occasionally bruising dark brown ("snuff" to "sepia") on the disc when

[2] Color names in quotations from Kornerup and Wanscher, Methuen Handbook of Color.