*Journal of Research on the Lepidoptera* 30(3-4):237-244, 1991

# Three New Taxa of *Calephelis* from Costa Rica (Lycaenidae: Riodininae)

George T. Austin

Nevada State Museum and Historical Society, 700 Twin Lakes Drive, Las Vegas, Nevada 89107

**Abstract.** Two new species and one new subspecies of *Calephelis* (Lycaenidae: Riodininae) are named from Costa Rica.

## Introduction

*Calephelis* Grote and Robinson, 1869 is a large riodinine genus (Lycaenidae); its species are typically difficult to determine. The subtle differences between taxa in size, wing shape, pattern, and genitalia are recognized only after considerable study and frustration. The revision of the group by McAlpine (1971) was a start in elucidating their diversity but has little comparative information. The species limits of the nearly forty putative species are debatable (e.g., Scott 1986) and may require detailed studies of the early stages or genetic data to resolve. Nonetheless, local faunas, at least, seem to have constant genitalia and, taking into account possible seasonal variation, pattern and color on the wings.

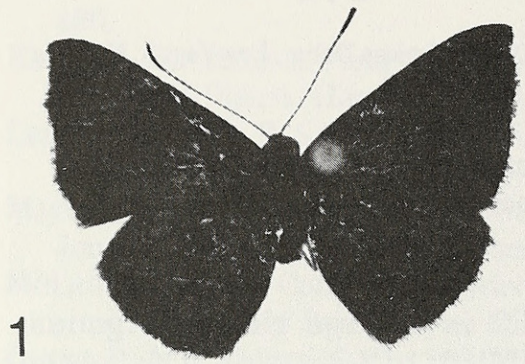
While examining the *Calephelis* for a treatment of the Costa Rica riodinine fauna (DeVries, in prep.), I encountered three phenotypes which have not been previously recognized. Because of a general disinclination of workers to deal with the genus and the need of names for the above mentioned work, I describe these herein to bring them to the attention of future taxonomists.

### ***Calephelis sodalis*** new species

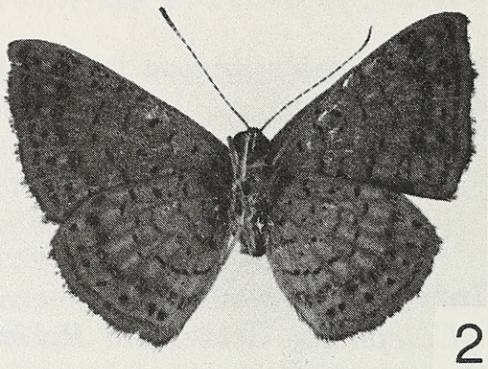
Figs. 1, 2 (male), 3, 4 (female), 13 (male genitalia)

**Description.** Male. Forewing length = 11.6 mm (11.0-12.3, N = 6; holotype = 11.2). Dorsum dark grayish red-brown; basal 2/3 of both wings with five relatively indistinct, broken, black lines from costa to inner margin, the outer broader than others and shaded slightly proximally with darker brown; marginal and submarginal lines distinct, iridescent blue-gray, the outer thin and more-or-less parallel to outer margin, narrowly broken at veins, the inner broader, composed of irregular scrawls or crescents, broken and often disjunct at veins, produced distally between veins $M_2$ and $CuA_1$ on both wings; row of rather large black dots between iridescent lines; area distal to black dots red-brown, lacking gray cast of remainder of wing; fringes checkered about equally with whitish and dark gray.

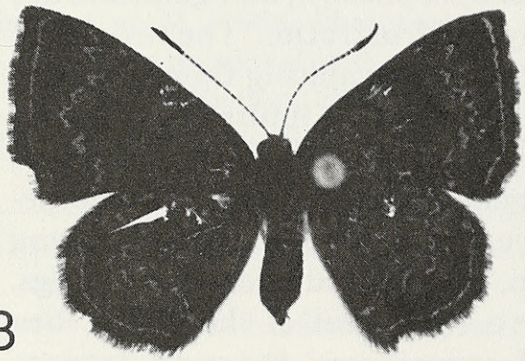
Ventral surface bright orange-brown with markings of dorsum repeated; basal black lines very fine, segments often obsolete in some cells; outer black line usually single (occasionally trace of doubling on more



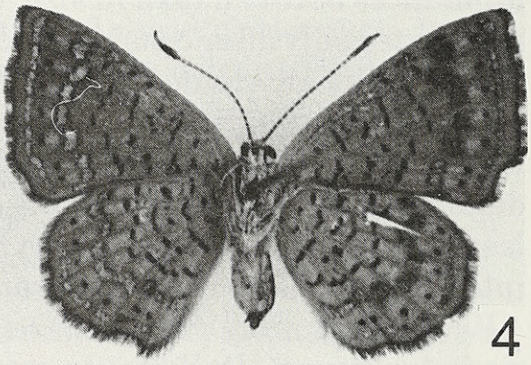
1



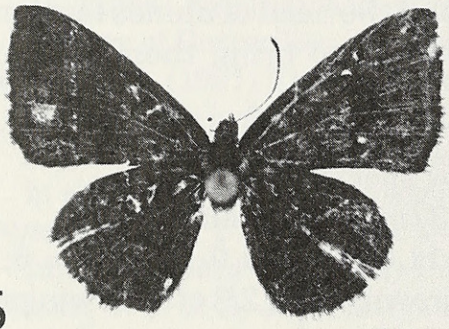
2



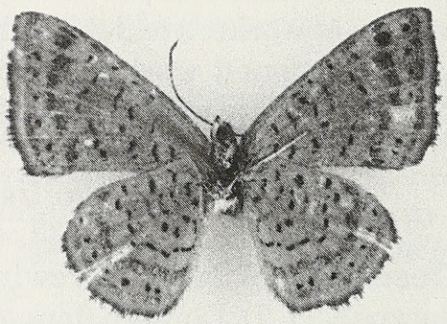
3



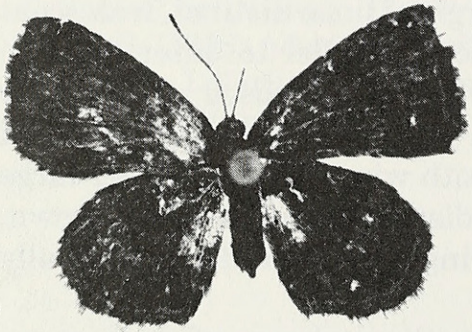
4



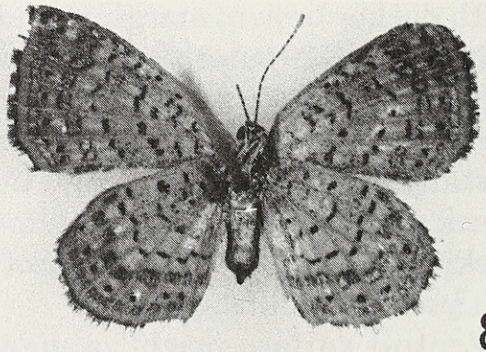
5



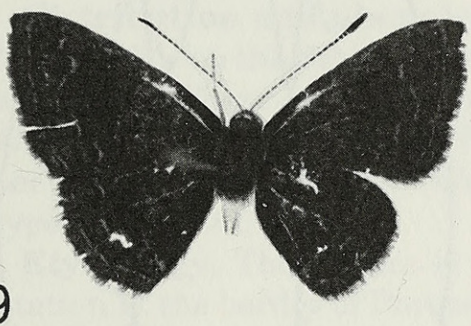
6



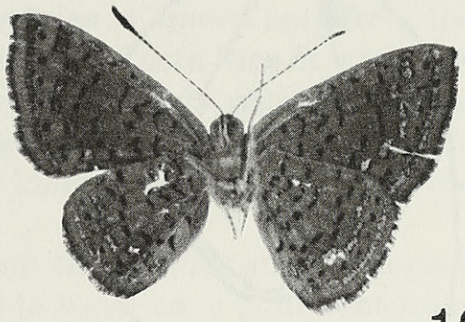
7



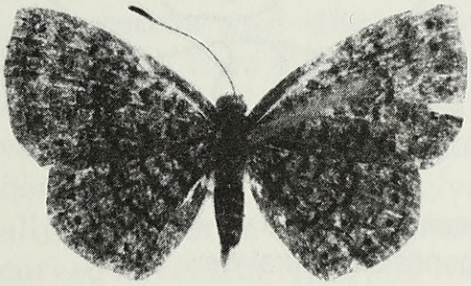
8



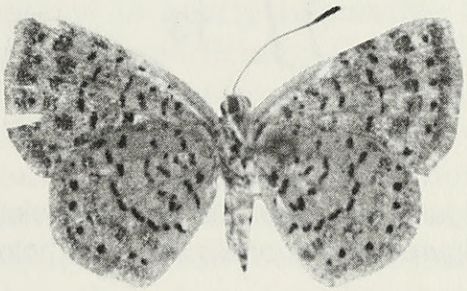
9



10



11



12

---

**Facing Page:**

Figure 1. *Calephelis sodalis* Austin - holotype male, dorsal surface. Data in text.

Figure 2. *Calephelis sodalis* - holotype male, ventral surface.

Figure 3. *Calephelis sodalis* - paratype female, dorsal surface. COSTA RICA: Puntarenas Prov.; Las Alturas, Tajo Rd. & pasture top, 8 Sept. 1990.

Figure 4. *Calephelis sodalis* - paratype female, ventral surface. Same specimen as Fig. 3.

Figure 5. *Calephelis exiguus* Austin - holotype male, dorsal surface. Data in text.

Figure 6. *Calephelis exiguus* - holotype male, ventral surface.

Figure 7. *Calephelis exiguus* - paratype female, dorsal surface. COSTA RICA: Limon Prov.; Sixaola Rd., 14 km SE Bribri, 3 Sept. 1987.

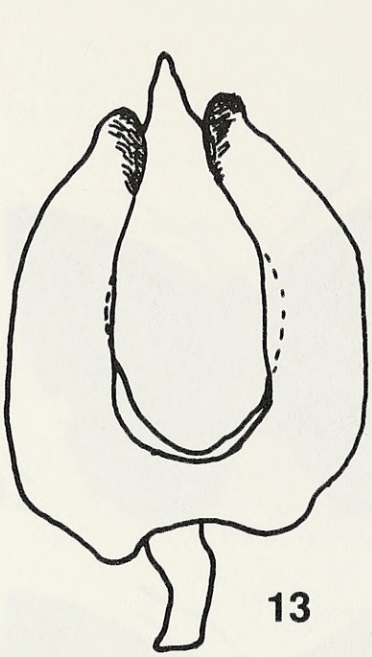
Figure 8. *Calephelis exiguus* - paratype female, ventral surface. Same specimen as Fig. 7.

Figure 9. *Calephelis laverna parva* Austin - holotype male, dorsal surface. Data in text.

Figure 10. *Calephelis laverna parva* - holotype male, ventral surface.

Figure 11. *Calephelis laverna parva* - paratype female, dorsal surface. COSTA RICA: Puntarenas Prov.; Osa Peninsula, 2.5 mi SW of Rincon, 1-7 Mar. 1967.

Figure 12. *Calephelis laverna parva* - paratype female, ventral surface. Same specimen as Fig. 11.



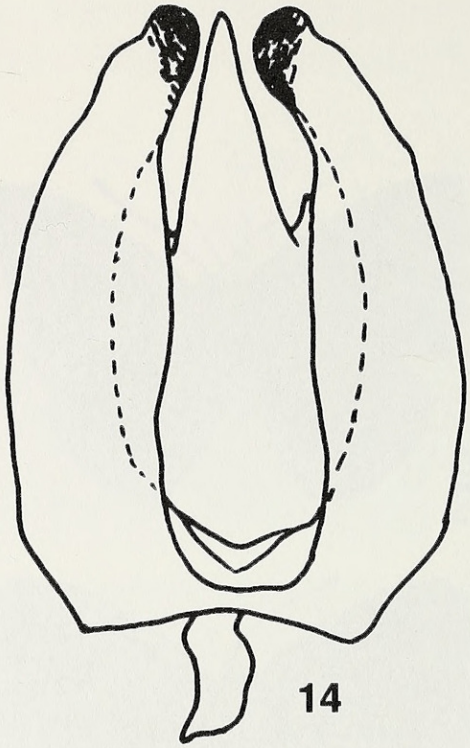




Figure 13. *Calephelis sodalis* - holotype male genitalia, ventral view.
Figure 14. *Calephelis exiguus* - holotype male genitalia, ventral view.

heavily marked individuals); iridescent lines broader and greener than on dorsum, inner less irregular and in form of bars especially on forewing. No seasonal variation among individuals seen.

Head, thorax, and abdomen concolorous with wings above, paler than ground color beneath; antennae black with distinct white annular rings, club often whitish on outside edge, tip orange.

Genitalia: valvae short and relatively broad in lateral view, evenly, but not broadly, curved in ventral view; transtilla exceeding valva length, narrow and curved dorsad at the posterior end, both pairs of lateral processes usually well developed.

Female. Forewing length = 12.5 mm (11.9-12.8, N = 7). Similar to male; dorsum less dark especially basally; median dark band more prominent; venter more ochraceous with all lines more prominent.

**Types.** Holotype male with the following labels: white, printed and handprinted - Costa Rica Puntarenas / Las Alturas 1400m / Tajo Rd & Bella Vista / 26 May 1991 / time 10:30 / P. J. DeVries; white, printed and handprinted - Genitalic Vial / GTA - 1880; red, printed - HOLOTYPE / *Calephelis sodalis* / Austin. Eleven paratypes (all COSTA RICA: Puntarenas Province, *leg.* P. J. DeVries): Las Alturas, 1600 m, Tajo Bella vista, 25 Aug. 1990 (3 males), 17 Aug. 1990 (1 female), 8 Sept. 1990 (1 male), 5 June 1991 (1 male); Tajo Rd. & pasture top, 1500 m, 8 Sept. 1990 (2 males, 3 females).

**Deposition of types.** The holotype and one female paratype will be deposited at the Allyn Museum of Entomology. One pair of paratypes will be retained by the author and the remaining paratypes will be returned to Philip J. DeVries.

**Type locality.** COSTA RICA: Puntarenas Province; Las Alturas, elevation 1400-1600 m. Las Alturas is on the Pacific slope of southern Costa Rica, northwest of San Vito at about 8 km west of the Panama border.

**Distribution and phenology.** This species is known only from the type locality on the Pacific slope of southeastern Costa Rica at moderate elevations. There evidently are at least two broods with specimens known from May (fresh), June (worn), August (worn, fresh), and September (worn, fresh). No other *Calephelis* are known from the vicinity of the type locality of *C. sodalis*.

**Etymology.** The species is known from the Las Alturas Biological Station at the border of Parque Nacional la Amistad, a joint venture of Costa Rica and Panama. The name refers to comradship or friendship in Latin.

**Diagnosis and discussion.** This species is nearly impossible to distinguish from *Calephelis browni* McAlpine superficially. *Calephelis sodalis* is slightly larger than *C. browni* and the basal markings on the ventral wings are less well defined on the average. The genitalia are, however, distinctive. The valvae of *C. browni* are longer and proportionally narrower in lateral view than those of *C. sodalis*, are less evenly curved in ventral view, and there is less space between them anteriorly. The transtilla of *C. browni* is shorter than the valvae, broader at the posterior end, and the anterior processes are often poorly developed. The male genitalia are similar to those of *Calephelis dreisbachi* McAlpine, *Calephelis montezuma* McAlpine, and *Calephelis azteca* McAlpine, all known only from Mexico, differing in minor details. The pattern and color of the wings are different. Other small to medium-sized species of the genus in Costa Rica with the transtilla exceeding the valvae in length are *Calephelis schausi* McAlpine on which the transtilla greatly exceeds the valvae, the wings are more rounded, and the maculation is quite different; *Calephelis inca* McAlpine which is very small and has a paler and brighter dorsal coloration; and *Calephelis laverna* (Godman and Salvin) which again is smaller and has very different short and stout valvae.

***Calephelis exiguus*** new species

Figs. 5, 6 (male), 7, 8 (female), 14 (male genitalia)

**Description.** Male. Forewing length = 10.0 mm (9.7-10.1, N = 4; holotype = 10.1). Dorsum dark red-brown; basal 2/3 of both wings with five indistinct, broken, black lines from costa to inner margin, the outer shaded very slightly proximally with darker red-brown; marginal and submarginal lines indistinct, iridescent blue-gray, both thin, the outer more-or-less parallel to outer margin, narrowly broken at veins particularly on hindwing, the inner sinuous, produced distally between veins $M_2$ and $CuA_1$ on both wings, broken at veins; row of rather large black dots between iridescent lines; fringes dark gray checkered with white.

Ventral surface dull orange-brown with markings of dorsum repeated; basal black lines very fine, broken at veins; outer black line single; iridescent lines broader and more prominent than on dorsum.

Head, thorax, and abdomen concolorous with wings above, paler than ground color beneath; antennae black with narrow white annular rings, club with orange tip.

Genitalia: valvae in lateral view relatively narrow and curving ventrally throughout their length, rather square anteriorly before curving inward posteriorly in ventral view, broadly rectangular space between; transtilla equal to valva length, very narrow and evenly tapered posteriorly, very slightly curved dorsad, posterior lateral processes well developed, anterior small.

Female. Forewing length = 9.7, 11.2. Similar to male; wings much more rounded; ventral iridescent lines broader.

**Types.** Holotype male with the following labels: white, printed - COSTA RICA / Limon Province / Sixaola Road / Paraiso / 3 Sept. 1987 / leg. G&A Austin; white, printed and handprinted - Genitalic Vial / GTA -1523; red, printed - HOLOTYPE / *Calephelis exiguus* / Austin. Five paratypes (all COSTA RICA: Limon Province, *leg.* G&A Austin): same data as the holotype (1 male); La Bomba, 2 Sept. 1987 (1 male, 1 female); Rio Blanco Road, Rio Victoria, 6 Oct. 1987 (1 male); Sixaola Rd., 14 km SE Bribri, 3 Sept. 1987 (1 female).

**Deposition of types.** The holotype and one paratype female will be deposited at the Allyn Museum of Entomology. The remaining paratypes will be retained for now by the author.

**Type locality.** COSTA RICA: Limon Province; Sixaola Road, Paraiso, elevation ca. 50 m. This locality is on the Atlantic slope of easternmost Costa Rica, less than 2 km north of the Panama border about half way between Sixaola and the main road to Limon (Ruta 36). The types were taken from roadside flowers.

**Distribution and phenology.** The species is known from the types, all taken below 100 m on the Atlantic slope of eastern Costa Rica (southeast of Limon) in September and October and a male from Madre de Dios, Limon Province, taken in July. Two males from Heredia Province taken in May and June are slightly darker on the dorsum with more distinct silvered lines. These may prove to be a seasonal phenotype of *C. exiguus*.

Two other *Calephelis* are known from the region inhabited by *C. exiguus*: *Calephelis sixaola* McAlpine and *Calephelis browni* McAlpine.

**Etymology.** The name means small and refers to the small size of this species.

**Diagnosis and discussion.** Superficially, this species resembles a small *Calephelis costaricicola* Strand but the median dark band is less well developed, the ventral ground color is more orange (more ochraceous on *C. costaricicola*), the lines are more poorly developed on the ventral surface without the doubling and shading of the outer basal line, and the forewings are less produced. The male valvae are not as broadly rounded as on *C. costaricicola* and the transtilla is narrower; *C. costaricicola* is not known from the Atlantic slope. *Calephelis browni* is larger, deeper orange-brown beneath and tends to have a grayish cast distal to the more

prominent dark median band on the dorsal wings. The male genitalia of *C. browni* are more robust than those of *C. exiguus* and curved ventrad more abruptly at the posterior end. Of the other small species of the genus in Costa Rica, *C. inca* is brighter, more orange-brown on the dorsal surface and *C. laverna* is a richer red-brown on the dorsum with more prominent iridescent lines and has a brighter ventral ground color with the various lines much better defined. The male genitalia of both *C. inca* and *C. laverna* are very different with the transtilla greatly exceeding the length of the valvae.

***Calephelis laverna parva*** new subspecies

Figs. 9, 10 (male), 11, 12 (female)

**Description.** Male. Forewing length = 9.9 mm (9.7-10.2, N = 6; holotype = 9.9). Dorsum dark red-brown, tending towards brighter red-brown distally; basal 2/3 of both wings with five relatively distinct, broken, black lines from costa to inner margin, the outer broader than others and shaded slightly (or not) proximally with darker brown; marginal and submarginal lines relatively distinct, iridescent blue-gray, the outer thin and more-or-less parallel to outer margin, narrowly broken at veins, the inner broader, broken and somewhat disjunct at veins, produced distally between veins $M_2$ and $CuA_1$ on both wings; row of rather large black dots between iridescent lines, distinct on hindwing, distinct or not on forewing; fringes dark gray, checkered narrowly with whitish.

Ventral surface bright, dark orange-brown with markings of dorsum repeated; basal black lines distinct; outer black line single; iridescent lines slightly broader and more blue-green than on dorsum, inner less irregular and in form of bars especially on forewing. Material from March is somewhat darker than that from July.

Head, thorax, and abdomen concolorous with wings above, paler than ground color beneath; antennae black with distinct white annular rings, club with orange tip.

Genitalia: valvae very short and relatively broad in lateral view; short, stout, and straight in ventral view; transtilla greatly exceeding length of valvae, very narrow at posterior end, anterior pair of lateral processes well developed.

Female. Forewing length = 9.9 mm (9.2-10.6, N = 3). Similar to male; wings much broader and rounder; dorsum slightly less dark especially basally; median dark band more prominent; venter ochraceous to ochraceous orange with all markings more prominent.

**Types.** Holotype male with the following labels: white, printed and handprinted - COSTA RICA / Puntarenas Prov. / Osa Peninsula / 2.5 mi. SW. Rincon / 08° x42' N. 83° 29' W. / III - 1 to 7 - 1967 / OTS Adv. Zoo. Course; white, printed - J. M. Nelson / Collector; white, printed - Downey colln. / Allyn Museum / Acc. 1985 - 14; white, printed and handprinted - Genitalic Vial / GTA - 1863; red, printed - HOLOTYPE / *Calephelis laverna / parva* Austin. Eight paratypes (all COSTA RICA: Puntarenas

Province): same data as holotype (1 male, 1 female), Paso Canoa, 160 m, 19 July 1963, *leg.* L. D. Miller (1 male, 1 female), 20 km N of Palmar Sur, 140 m, 22 July 1963, *leg.* L. D. Miller (1 female), Parque Nacional Corcovado, Sirena, 20 m, 6 March 1989, *leg.* N. Greig (1 male), Corcovado, Sirena, 7 March 1989, *leg.* N. Greig (1 male), La Vacita, 24 March 1990, *leg.* P. J. DeVries (1 male).

**Deposition of types.** The holotype and a pair of paratypes will be deposited at the Allyn Museum of Entomology. One male and two female paratypes will be deposited at the Carnegie Museum of Natural History. Two male paratypes are in the care of P. J. DeVries and one male paratype will be retained by the author.

**Type locality.** COSTA RICA: Puntarenas Province; Osa Peninsula, 2.5 miles southwest of Rincon. This is near sea level in the northeastern portion of the Osa Peninsula on the Pacific Coast of southern Costa Rica.

**Distribution and phenology.** This species is known only from the Pacific slope of southern Costa Rica at low elevations near the coast and centered on the Osa Peninsula. There evidently are at least two broods with fresh material from March and July. One other species of the genus, *Calephelis schausi* McAlpine, is known within the distribution of *C. l. parva*.

**Etymology.** The name refers to the small size of this subspecies of *C. laverna*.

**Diagnosis and discussion.** The male genitalia of this phenotype are virtually identical to those of *Calephelis laverna laverna* (Godman and Salvin) described from "V. de Chiriqui" (Panama). McAlpine (1971) apparently viewed the type, additional specimens from the type locality and nearby, and from South America. The only variation he noted was of material from Trinidad and adjacent Venezuela which had somewhat different genitalia and was described as *Calephelis laverna trinidadensis*. Specimens of *C. laverna* which I have seen from Panama and Columbia are considerably larger (the forewing length averaging about 12 mm), are distinctly more reddish above, and thus the various markings are much more distinct.

*Acknowledgments.* I thank the curators and others at various museums for the opportunity to examine specimens in their care: L. D. and J. Y. Miller (Allyn Museum of Entomology), J. Rawlins (Carnegie Museum of Natural History), F. Rindge and G. Martinez (American Museum of Natural History), and S. Borkin (Milwaukee Public Museum). P. J. DeVries kindly loaned material in his care and made numerous suggestions for improvement of the manuscript.

## Literature Cited

McAlpine, W. S. 1971. A revision of the butterfly genus *Calephelis* (Riodinidae). Jour. Res. Lepid. 10: 1-125.

Scott, J. A. 1986. The butterflies of North America, a natural history and field guide. Stanford University Press, Stanford, CA.