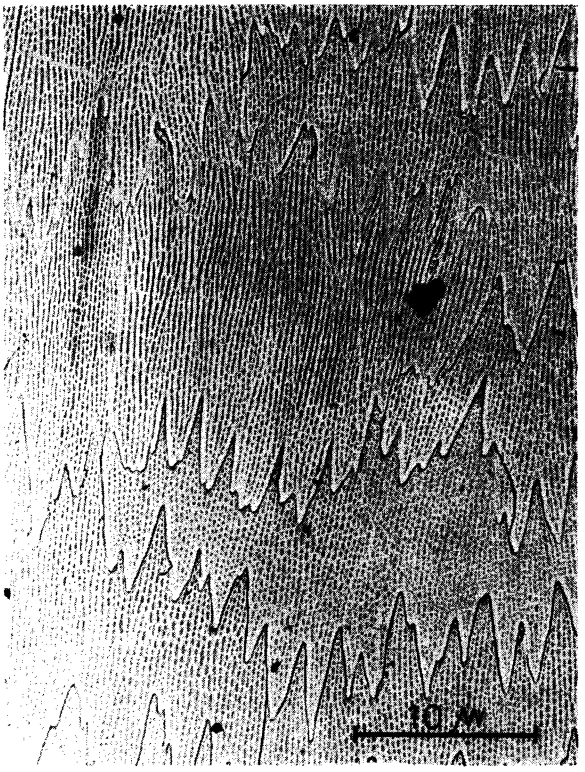

FIG. 3. *Epicrates cenchria crassus* Cope (1862).

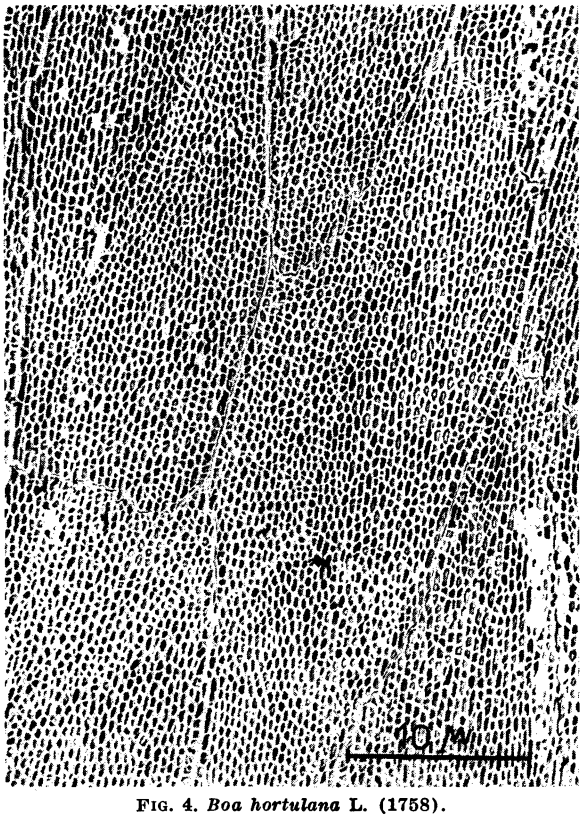

FIG. 4. *Boa hortulana* L. (1758).

6300. The micrographs are direct prints, thus representing a negative image of the scale surface. The dorsal scale pattern is uniform over all of the surface of the replica, is reproducible within the species, and is the same in both sexes. We observed differences among various species of the same genus, but there appeared no differences among subspecies.

The patterns of the 5 genera examined are the following: *a*) *Constrictor* and *Xenoboa* (*5*) show furrows of irregular form, parallel to the axis of the scale (Fig. 1). *b*) *Eunectes* and *Epicrates* show irregularly pointed, periodically repeated waves, whose profile is raised above the surface of the stratum corneum as shingles on a roof, and it is perpendicular to the longitudinal axis of the scale. Between the waves are found depressions of elliptical form regularly distributed in the stratum corneum (Figs. 2 and 3). *c*) *Boa* shows a network whose walls are salient upon the surface of the stratum corneum, as can be observed in Fig. 4.

The value of this method in taxonomy is shown by the following example: the exact determination of *Eunectes notaeus* Cope, 1862, and *Eunectes dechauenseei* Dunn and Conant, 1936, based upon the characters generally used often offers great difficulties and in the electron microscope, the scales from these 2 species show different design.

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Manuscript received June 18, 1953.

Thermochromism of Diaryldisulfides

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Contrary to the views previously accepted (*1*), it was pointed out for the first time by Schönberg (*2*) that diphenyl disulfide (Ia) and related substances are capable of forming free arylthiyl radicals (e.g., C_6H_5)

TABLE 1

KNOWN THERMOCHROMIC DISULFIDES

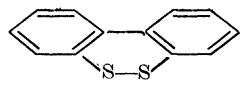
Diphenyl- (Ia) (*1*, *2*)
p,*p*′-Dibromodiphenyl- (Ib) (*3*)
p,*p*′-Dimethylaminodiphenyl- (Ic) (*1*)
o,*o*′-Biphenylene- (II) (*2*)*
2-Benzothiazolyl- (III)
bis-(Thio-α-naphthoyl)-disulfide ($\alpha\text{-}C_{10}H_7 \cdot \underset{\underset{S}{\|}}{C} \cdot S \cdot S \cdot \underset{\underset{S}{\|}}{C} \cdot C_{10}H_7$) (*2*)

* Schönberg, Rupp, and Gumlich observed that the yellow solutions of this compound obey Beer's law, which is expected, since dissociation, if occurring, does not lead to an increase of the number of molecules in the dissolved phase.

in hot solutions. The thermochromic properties of diaryldisulfides and thioacyldisulfides of the aromatic series (Table 1) may be attributed to reversible thermal dissociation into colored free radicals (dissociation theory) which explains also the fact, according to Rupp (*2*), that their hot solutions do not obey Beer's law. The dissociation theory has been strengthened by the study of the magnetic measurements of (III), the ultraviolet absorption of (Ia, Ib) (*3*) and (III) (*4*) and the pyrolysis of (Ia) (*5*).

$Ar \cdot S \cdot S \cdot Ar$
(Ia) $Ar = C_6H_5$; (Ib) $Ar = p\text{-}C_6H_4Br$
(Ic) $Ar = p\text{-}C_6H_4 \cdot NMe_2$
(Id) $Ar = B \cdot C_{10}H_7$; (Ie) Ar = 9-anthryl

I



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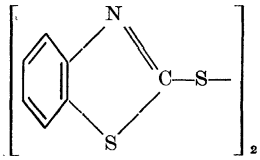
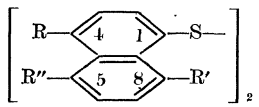


III

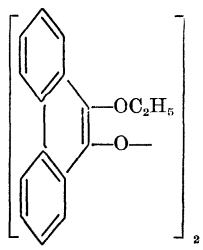
The thermochromic properties of the diaryldisulfides (Table 2) have now been studied and it has been found that their solutions in anisole or diphenyl ether and/or in ethyl benzoate show pronounced thermochromic properties which may be attributed, by analogy, to reversible thermal dissociation into free radicals. The structure of the colorless (IVd) is somewhat analogous to that of bis-(9-ethoxy-10-phenanthryl)-peroxide (V) which shows dissociation into free radicals (*6*) (the peri-positions being analog to the ortho-positions); the color of the solutions of (IVd) in anisole or in diphenyl ether and/or in ethyl benzoate is pale yellow at room temperature and deepens gradually when the temperature is raised to the boiling point, and then fades when the temperature is lowered.

8,8′-Dihydroxy-1,1′-dinaphthyldisulfide (IVc), 5,5′-dimethyl-8,8′-dihydroxy-1,1′-dinaphthyldisulfide (IVe), and dibenzenesulfonyl-8,8′-diamino-1,1′-dinaphthyldisulfide (IVf) were synthesized by the action of lithium aluminium hydride on naphthosultone, 4-methylnaphthosultone and N-benzenesulfonylnaphthosultam, respectively, and (IVd) was obtained by the action of benzoyl chloride in presence of aqueous sodium hydroxide solution on (IVc). (The experimental details will be published later.)



(IVa) $R = R' = R'' = H$
(IVb) $R' = R'' = H$; $R = O \cdot CO_2C_2H_5$
(IVc) $R = R'' = H$; $R' = OH$
(IVd) $R = R'' = H$; $R' = O \cdot CO \cdot C_6H_5$
(IVe) $R = H$; $R' = OH$; $R'' = CH_3$
(IVf) $R = R'' = H$; $R' = NHSO_2C_6H_5$

IV



V

TABLE 2

NEW THERMOCHROMIC DISULFIDES

Compound	Color of solid	Color of melt	Color of solutions in anisole or in diphenyl ether and/or in ethyl benzoate	
			Cold	Hot
α-Dinaphthyldisulfide (IVa)*	Colorless	Yellow	Pale yellow	Deep yellow
β-Dinaphthyldisulfide (Id)*	Pale yellow	Yellow	Pale yellow	Deep yellow
4,4′-Dicarbethoxy-1,1′-dinaphthyldisulfide (IVb) (*7*)	Colorless	Yellow	Pale yellow	Deep yellow
8,8′-Dihydroxy-1,1′-dinaphthyldisulfide (IVc)	Yellow	Orange	Yellow	Orange-yellow
Dibenzoyl-8,8′-dihydroxy-1,1′-dinaphthyldisulfide (IVd)	Colorless	Yellow	Pale yellow	Deep yellow
5,5′-Dimethyl-8,8′-dihydroxy-1,1′-dinaphthyldisulfide (IVe)	Yellow	Orange	Yellow	Orange-yellow
Dibenzenesulfonyl-8,8′-diamino-1,1′-dinaphthyldisulfide (IVf)	Colorless	Yellow	Pale yellow	Deep yellow (in anisole) (decomp. in diphenyl ether and ethylbenzoate)
9,9′-Dianthryldisulfide (Ie) (*8*)	Orange	Orange-red	Orange-yellow	Orange-red

* Purchased from L. Light and Co., London.

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Manuscript received April 23, 1953.

In Vitro Activity of Micoina on *Brucellae*, Compared with that of Terramycin[1]

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Mycoin C, an antibiotic complex that has at least four components C_1, C_2, C_3, and C_4 (*1*), is the basis of the pharmaceutical product *micoina*.[3] The complex was isolated from species of *Penicillium* by Lembke and co-workers (*2, 3*), studied in Germany (*1–5*) and in France (*6–10*), and its *in vitro* and *in vivo* activity against *Brucellae* observed. Preliminary clinical trials with mycoin C, or with some of its fractions, in the treatment of human, bovine, equine, and ovine brucellosis gave promising results (*4, 8–10*) but more work is needed in this field. The fraction C_3 seems to be identical to patulin (*5, 6*).

[1] This work was supported in part by a grant from Dr. Guilherme Guinle. Presented at the meeting of the Rio Branch of Society of American Bacteriologists, November 1952.

[2] Captain, Brazilian Army Veterinary Service.

[3] Supplied as a white powder through courtesy of Cia. Mycoina Panamericana, Montevideo, Uruguay, and Laboratorios Moura Brasil-Orlando Rangel S. A., Rio de Janeiro, Brazil.

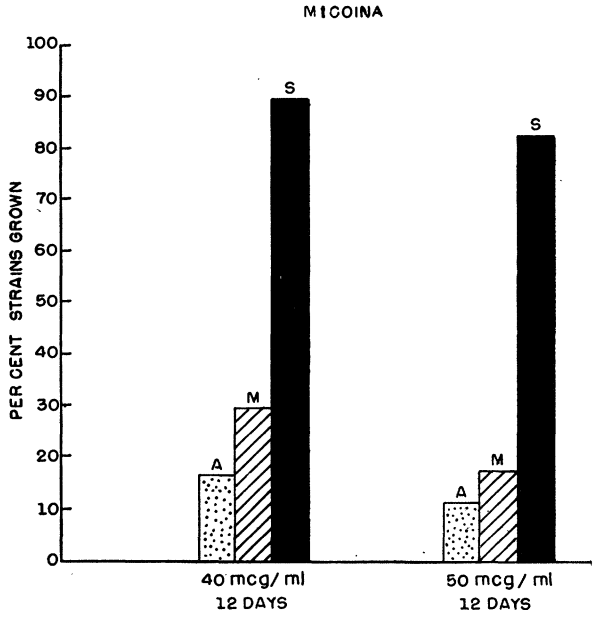

FIG. 1. Per cent of strains of *Brucellae* that survived to a 12 days exposure to 40 and 50 μg of micoina. Dotted, *Br. abortus*; crosshatched, *Br. melitensis*; solid, *Br. suis*. All the other strains died.

We observed striking differences between the action of micoina and Terramycin[4] against the three species of *Brucella*.

Eighty-two strains of *Brucella* from various sources were utilized: they were 36 *Br. abortus* (all aerobic), 29 *Br. suis*, and 17 *Br. melitensis*.

Dextrose veal infusion broth enriched with 0.5% trypticase (pH 6.9) in amounts of 2 ml was inoculated with a loopful of the stock cultures; after 24 or 48 hr of incubation, 0.1 ml of such cultures was transferred

[4] Terramycin hydrochloride for intravenous use, prepared by Chas. Pfizer & Co., Inc., U. S.

TABLE 1

NUMBER OF STRAINS OF *Brucellae* THAT GREW IN THE PRESENCE OF 40 AND 50 μg OF MICOINA*

Concentration of micoina	*Brucella*†	Days of observation			
		1–3	5	6	12
40 μg/ml	*abortus*	0	4(11.1%)	5(13.9%)	6(16.7%)
	melitensis	0	3(17.6%)	4(23.5%)	5(29.4%)‡
	suis	0	22(75.9%)	25(86.2%)	26(89.7%)§
50 μg/ml	*abortus*	0	3 (8.3%)	4(11.1%)	4(11.1%)
	melitensis	0	3(17.6%)	3(17.6%)	3(17.6%)
	suis	0	12(41.4%)	21(72.4%)	24(82.8%)‖

* All the controls grew within 24 hr. The tubes were not observed in the 4th and 11th days. All the strains that did not grow within 12 days, did not develop in subsequent days and were dead when tested after 10 days of further incubation.

† *Br. abortus*, 36 strains; *Br. suis*, 29 strains; *Br. melitensis*, 17 strains.

‡ One strain grew in the 12th day.

§ One strain grew in the 9th day.

‖ Two strains grew in the 7th day and another in the 8th day.