and comparing their indices of toxicity, a fairly constant difference can be found; the 20 and 10 ml/l serum in water toxicity index is 3.0 and 0.4 for females, whereas the corresponding values for men are 3.7 and 1.1, respectively. It is probably not going too far to connect the higher indices of serum toxicity in men with their higher daily average 17-ketosteroids excretion if compared with that of women (*5*).[4]

References

1. FISCHER, R. *Monthly Rev. Psychiat. Neurol.* In press.
2. SELYE, H. *Stress.* Montreal: Acta Inc. (1950).
3. KALLMANN, F. J. *Congr. intern. psychiat., Paris,* **6**, 1 (1950).
4. UTERS, M., *et al. Deut. med. Wochschr.,* **76**, 1408 (1951).
5. ZIMMERMANN, W. *Ibid.,* **76**, 1363 (1951).

[4] More detailed information on this and other aspects of the problem are to be considered in a future report.

Manuscript received May 6, 1953.

Submicroscopic Structure of "Stratum Corneum" of Snakes[1]

A. R. Hoge and P. Souza Santos

Laboratório de Ofiologia and Laboratório de Virus do Instituto Butantan, São Paulo, Brasil

Superficial microstructure of stratum corneum was noted in European snakes by Leydig (*1*), who suggested its use in systematics as an auxiliary character. Picado (*2*) compared this microornamentation in 3 *Crotalinae*; Schöttler (*3*) in 4 species of the genus *Vipera.*

FIG. 1. *Constrictor constrictor amarali* Stull (1932) (L. 1758).

The dorsal scales of members of the family *Boidae* do not present visible microstructure through the optical microscope. Examination by the electron microscope, however, showed a submicroscopic structure of taxonomic value.

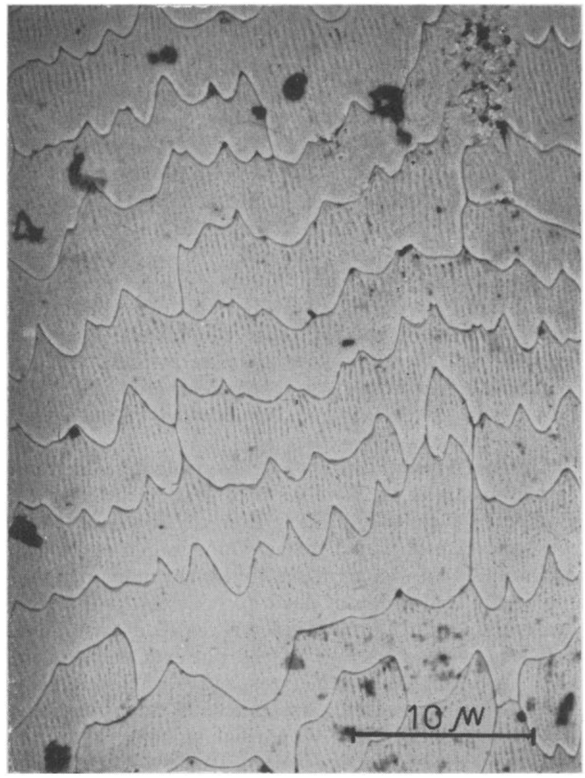

FIG. 2. *Eunectes murinus* L. (1758).

Ten South American species belonging to 5 genera were examined; these included not less than 3 examples of each species, and at least one example of each sex per species. Superficial structure was found in all examples. In addition, a microstructure in the ventral and cephalic shields also could be noted.

Skin fragments with approximately 20 scales were selected from the vertebral mid-body region of adult snakes and washed with acetone. The scales were separated by means of a scalpel, dried, and covered with a 0.5% parlodion solution in amyl acetate. After drying at 50°–60° C, replicas were obtained from the center of the scale by the dry-stripping method (*4*) and shadowed with chromium at an angle of 10°.

Examination of the replicas was made with the help of a Siemens electron microscope, type UM 100b, at 40 kv. Three to four replicas of different scales were examined in order to check the reproducibility of the observed structure. Electron micrographs were taken of representative fields at magnifications of 1300 and

[1] This work has been supported by grants from the Conselho Nacional de Pesquisas.

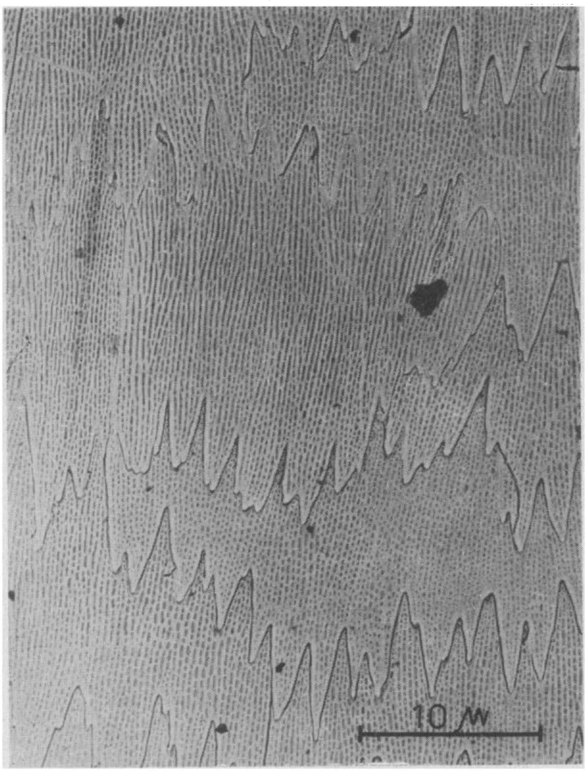

FIG. 3. *Epicrates cenchria crassus* Cope (1862).

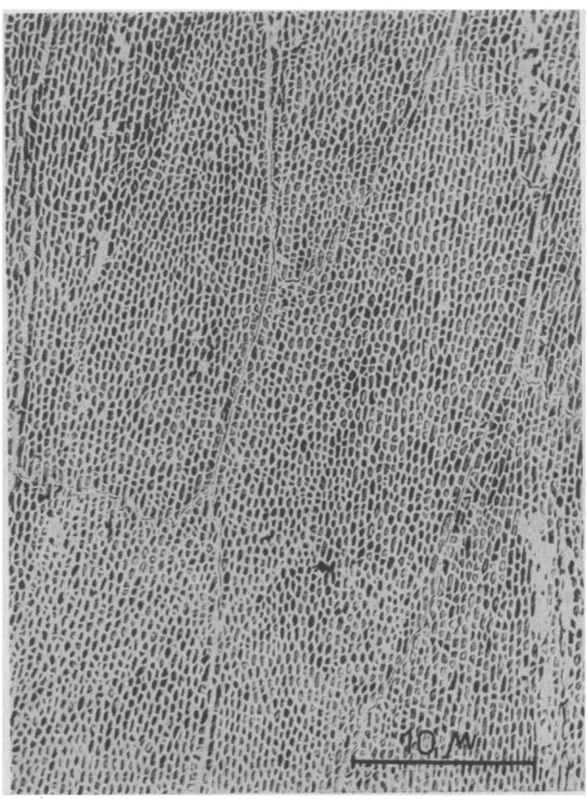

FIG. 4. *Boa hortulana* L. (1758).

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.

References

1. LEYDIG, F. *Arch. mikroskop. Anat. Entwicklungsmech.*, **9**, 753 (1873).
2. PICADO, C. *Bull. Antivenin Inst. Am.*, **4**, 104 (1931).
3. SCHÖTTLER, W. H. A. *Z. Hyg. Infektionskrankh.*, **120**, 408 (1938).
4. SCHAFFER, V. J. *Science*, **97**, 188 (1943).
5. HOGE, A. R. *Mem. inst. Butantan* (*São Paulo*), **24**. In press.

Manuscript received June 18, 1953.

Thermochromism of Diaryldisulfides

Ahmed Mustafa and Mohamed Kamel

Department of Chemistry, Faculty of Science, University Fouad I, Cairo, Egypt

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
(α-$C_{10}H_7 \cdot \underset{S}{C} \cdot S \cdot S \cdot \underset{S}{C} \cdot C_{10}H_7$) (*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.