MARINE SHELLS OF THE SOUTHWEST COAST OF FLORIDA

Marine Shells of the Southwest Coast of Florida. By LOUISE M. PERRY. No 95, *Bulletin of American Paleontology,* Paleontological Research Institution, Ithaca, N. Y., 260 pp., 39 pls., 6 text figures and frontispiece. 1940. Paper cover, $3.50; board cover, $4.50.

THIS volume contains descriptions of 346 shells, of which 3 are Loricata (coat-of-mail shells); 161 Pelecypoda (bivalves); 6 Scaphapoda (tooth shells), and 176 Gastropoda (univalves).

I know of no contribution that will be hailed with more pleasure by the flock of nature lovers that throng the beaches of the west coast of Florida every winter than the present volume.

Dr. Perry, for almost a quarter of a century, has been a beach-comber herself; becoming fascinated by the subject, she has not only searched the flotsam and jetsam of the beaches about Sanibel Island, the richest marine collecting ground in America, but has devoted much time to dredging, thereby bringing to light the denizens of the deeper waters. By this combined effort she has accumulated the finest collection secured in this region and an endless amount of information about the ecologic adjustment, seasonal migration and life histories of mollusks, as well as the means of securing and preparing these creatures for the cabinet. All this information has been condensed in the pages of her book. Her descriptions are simply told, concise and to the point, and the illustrations will give pleasure to the picture-minded amateur seeking a name for some new-found treasure.

It is to be hoped, now that the more obvious larger forms have been adequately treated, that Dr. Perry will direct her attention to the minute forms, for example, the members of the families Pyramidellidae, Cerithiopsidae, Rissoideae, etc., which are greatly in need of revision.

We congratulate the collectors of Florida shells for having this new tool available, and compliment its author.

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SPECIAL ARTICLES

THE EXCRETION OF SPECIFIC FLUORESCENT SUBSTANCES IN THE URINE IN PELLAGRA

IN a recent publication Najjar and Wood[1] described a specific reaction in urine which was apparently dependent upon the store of nicotinic acid in the body. When urine was adsorbed on zeolite and subsequently eluted with KCl, the eluate on treatment with NaOH developed a bluish fluorescence. The substance responsible for this bluish fluorescence was not identified chemically, but could be measured quantitatively by means of a fluophotometer. Its fluorescent spectrum was published. It was shown that after the ingestion of nicotinic acid the excretion of this substance increased. It was suggested that in pellagra the excretion of this material might be diminished or absent, and that the quantity of this material excreted in the urine might serve as a measure of the deficiency of nicotinic acid. An opportunity to study pellagra patients had not, however, been obtained at the time of our previous publication.

Since then we have been able to study[2] four patients with typical pellagra. In one of these the symptoms were relatively mild; in two they were of moderate severity and in a fourth case they were unusually severe. None of these four patients, studied before treatment was commenced, excreted any of the material described by us giving the characteristic fluorescence on the addition of alkali to the urine eluate. A fifth pellagra patient, recently studied in Baltimore, likewise failed to excrete any of this material, as did also two dogs suffering from canine black tongue. It would, therefore, appear that we are in possession of a specific chemical reaction by which deficiency of nicotinic acid can be quantitatively measured. This reaction, it may be pointed out, is far more specific than the cyanogen bromide color reaction which has been used by a number of other investigators, since various pyridine derivatives which play no part in pellagra react positively with cyanogen bromide. Our studies on normal persons indicate that only the ingestion of pyridine derivatives with anti-pellagric activity will result in an increase of the fluorescent material described.

We now wish to report a further observation upon the urine of pellagra patients and of dogs with black tongue. Not only is there in pellagra the absence of a urinary component which develops fluorescence on alkalinization, but there appears in the urine of these patients a fluorescent substance which is not normally present, which gives a whitish-blue fluorescence without any alkali addition. Under the conditions used in carrying out our test,[1] this substance appears in the

[1] Najjar and Wood, *Proc. Soc. Exp. Biol. and Med.,* 44: 386, 1940.

[2] For the opportunity to study these cases, we are indebted to the courtesy and cooperation of Dr. Tom D. Spies, of Birmingham, Alabama.

blank. Even in the case of normal urine eluates a positive blank is always obtained—*e.g.*, there is a measurable bluish fluorescence in samples untreated with alkali. This blank is due in part to Rayleigh scattering of the light rays by the solvent itself, and in part to traces of unknown fluorescent compounds. In pellagra, however, the value of the blank is markedly increased, reaching in well-developed cases four or five times the normal values (see Table 1). The substance in the normal subject's urine. The presence of a relatively large amount of fluorescent material in the untreated urinary eluate of the pellagrin suggests that we may be dealing with the material responsible for the photosensitivity of these patients.

We wish to emphasize the fact that the dog with black tongue behaves exactly like the patient with pellagra with respect to the excretion of these fluorescent substances. This is contrary to our earlier impres-

TABLE 1

FLUORESCENCE* OF URINARY ELUATES

Range in normal subjects	Before treatment			After 50 mgms nicotinic acid by mouth		
	Blank†	After alkali	Increase (= substance F_2)	Blank†	After alkali	Increase (= F_2)
	10–15	30–50	20–35	15–20	50–70	35–50
Pellagra: Subject W (very mild)	12	12	0	22	40	18
Subject H (moderately severe)	38	38	0	26	43	17
Subject S (moderately severe)	104	69	0	60	71	11
Subject E (very severe)	64	36	0	40	34	0

* Fluorescence is expressed in Najjar-Wood units, one unit being the fluorescence caused by 1 microgram quinine sulfate dissolved in dilute sulfuric acid.[1] The figures given represent urinary excretion during a 4-hour period preceding and immediately following the administration of a dose of 50 milligrams nicotinic acid by mouth.

† The figure given represents the actual reading of the blank minus a constant correction which has been made for the Rayleigh scattering effect caused by the solvent itself. The fluorescence as given is caused by traces of unknown substances plus that of F_1 when present.

responsible for the increased fluorescence of the blank has not been identified as yet. Studies of its fluorescent spectrum are in progress. For the present we shall designate it as F_1 and we shall designate the fluorescent substance obtained from normal urine eluates after alkali addition as F_2.

The earliest change in the urine in pellagra appears to be the disappearance of F_2. This occurs before any appreciable increase in F_1 is noticeable (patient "W"). As the disease progresses the increase in F_1 becomes more and more striking. Conversely, it would appear that the first step in the healing of a severe case is some reduction in the excess of F_1, and that subsequent to this F_2 makes its appearance. The effect of treatment with a single dose of nicotinic acid is shown in Table 1. It may be seen that in the most severe case (patient "E") treatment produced only a reduction in F_1 without the appearance of any F_2. In the less severe cases the dose of nicotinic acid employed caused the appearance of F_2.

Our present interpretation of the significance of these two fluorescent compounds in the urine is as follows: an enzyme of which nicotinic acid is a component serves normally to convert the substance F_1 (which is fluorescent regardless of the reaction of the medium) into F_2, a substance which fluoresces in alkaline but not in acid solution. In states of nicotinic acid deficiency this conversion does not take place, and as a result F_1 accumulates. It is worthy of note that in pellagra the total fluorescence (found here altogether in the blank) is often far greater than the maximum fluorescence obtainable by any procedure sion. At the time of our previous publication we had had the opportunity to study only the urine of a single black tongue dog, before and after treatment. Because of the failure of the dog to excrete F_2 after what we supposed to be adequate treatment we concluded that the dog's metabolism might be different from that of man. It is now clear, however, that the failure of that animal after treatment to exhibit F_2 in his urine was attributable to inadequate treatment; he behaved exactly like the most severe of the pellagra patients, showing only a reduction in an elevated blank as the result of therapy. The adequately treated dog and the normal dog show F_2 in the urine just as in the case of the normal human being, and the concentration of F_2 can likewise be increased in the normal dog by the administration of nicotinic acid.

We have then two criteria by which to characterize states of nicotinic acid deficiency: (1) the disappearance of a normal substance which produces fluorescence on alkalinization, and (2) the appearance of an abnormal substance, which is fluorescent without any such treatment. Both of these substances can be measured quantitatively.

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EFFECT OF ALCOHOL ON VITAMIN A CONTENT OF BLOOD IN HUMAN SUBJECTS

IN this laboratory it has been shown in dogs that ingestion of alcohol will increase the amount of vita-