publication of a new *Southwestern Journal of Anthropology*, to appear early in 1945. Supplementing existing periodicals, this quarterly will provide additional space for articles in general anthropology. Contributions are invited by the editor, Dr. Leslie Spier, of the University of New Mexico.

A FIVE-VOLUME collection of photo-micrographs of more than a hundred meteorites, made by Stuart H. Perry, of Adrian, Mich., has been presented by him to the University of Michigan, where he conducted his work, to the Chicago Natural History Museum and to the U. S. National Museum. Three sets only have been made.

DISCUSSION

AMPHIPATHIC CHARACTER OF GELATIN SHOWN IN ITS ADSORPTION TO POLAR SURFACES

SOME experiments on the retention of gelatin by silver bromide made in these laboratories were described in 1932.[1] They were made with silver bromide grains centrifugally separated from a diluted silver bromide emulsion, and indicated that continued washing (at pH 6.5) brought down the retained gelatin to a limit after which no more was removed. The specific area of the grains was determined[2] and the thickness of gelatin estimated from experiments on film spreading.[3] From these measurements there was indicated a layer of the order of two molecules thick, *ca.* 16 Å. Further experiments, washing at higher temperature (boiling in water), reduced the value to one half. It was concluded that "a monomolecular layer was actually present, and that the rest of the gelatin was occluded in the grain, or . . . that a secondary layer is attached to the primary layer by weaker forces."

Recent experiments, using techniques developed in connection with the study of dye adsorption,[4] have enabled us to confirm the latter hypothesis, and to show that gelatin is primarily and irreversibly adsorbed, by polar groups, to silver halide as a monolayer, exposing nonpolar groups to the solution. As more gelatin is added to this, a second layer is built up, in which the nonpolar groups of the second layer adhere to—or cohere with—the nonpolar groups of the primary (priming) layer, while the polar hydrophile groups solvate and repeptize the first precipitate. This second layer—which is relatively reversible (Langmuir type of adsorption isotherm)—it is which confers on protein-covered silica—and other—particles the characteristic electric potential and charge of "adsorbed" protein, which is identical, therefore, with that of dissolved protein.[5] Whether molecularly stratified systems of still higher order can be built up[6] is still uncertain, though a reconsideration of some experimental work of A. H. Nietz,[7] of these laboratories, suggests that it may not be impossible. Concerning this and other aspects of the general problem of protein lamellae, fuller publication by the writer and colleagues is in preparation.

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EFFECT OF VITAMIN B_6 (PYRIDOXINE) IN THE TREATMENT OF LEUCOPENIA AND GRANULOCYTOPENIA OF TOXIC ORIGIN IN HUMANS. PRELIMINARY REPORT

AGRANULOCYTIC angina is a disease characterized by an acute febrile illness, necrotic and ulcerative lesions in the mouth and pharynx and an extreme reduction of the granulocytes in the blood. Granulocytopenia is pathognomonic of the disorder, although leucopenia is usually present as well. The disease is uncommon in the idiopathic form but occurs more often secondary to the administration of certain drugs such as amidopyrine, some barbiturates and dinitrophenol. Since the introduction of sulfonamides in the treatment of bacterial diseases, this complication has been noted more frequently. Within the past year, a similar hematologic catastrophe was described by Astwood[1] following the use of thiouracil for the treatment of hyperthyroidism. His findings have been amply confirmed. This hazard seriously interferes with and restricts the use of a large group of valuable therapeutic agents.

The accepted therapy relies on the use of blood transfusions and on pentose nucleotides. The result obtained by these means is often disappointing.

[1] S. E. Sheppard, R. H. Lambert and R. L. Keenan, *Jour. Phys. Chem.*, 36: 174–184, 1932.

[2] By photomicrographic scanning, *cf.* A. P. H. Trivelli and R. P. Loveland, *Jour. Franklin Inst.*, 204: 193, 377, 1927.

[3] S. E. Sheppard and R. L. Keenan, *Nature*, 121: 982, 1928; S. E. Sheppard, A. H. Nietz and R. L. Keenan, "Supermolecular State of Polymerized Substances in Relation to Thin Films and Interfaces," *Ind. Eng. Chem.*, 21: 126, 1929.

[4] S. E. Sheppard, R. H. Lambert and R. D. Walker, *Jour. Chem. Phys.*, 7: 265, 1939.

[5] H. A. Abramson, "Symposia on Quantitative Biology" (Cold Spring Harbor, N. Y.), I, 39 (1933).

[6] K. Blodgett and I. Langmuir, *Phys. Rev.*, 51: 964, 1937.

[7] A. H. Nietz: "Molecular Orientation at Surfaces of Solids, Pt. III. Monomolecular Films Measured by a Contact Angle Method," *cf. Ind. Eng. Chem.* (*News Edit.*), 6, No. 16, Aug. 20, 1928. Part III was presented at the 76th meeting of the American Chemical Society, September 10–14, 1928, but not published.

[1] E. B. Astwood, *Jour. Am. Med. Asn.*, 122: 78, 1943.

Sebrell and his associates[2] have shown that folic acid, a component of the vitamin B-complex, is effective in preventing and curing the neutropenia produced in rats by feeding the insoluble sulfonamides. It has been suggested[3] that this effect is an indirect one, in the sense that the folic acid fed is required by the coliform bacteria in the intestine for the production of some accessory substance which in turn produces the granulocytic response. Fouts *et al.*[4] observed that dogs with a dietary deficiency of vitamin B_6 develop a microcytic hypochromic anemia which is not relieved by iron. It is well known that the anemia of pellagra and pernicious anemia is similarly unresponsive to iron. Since pyridoxine is a constituent of liver and yeast, both of which are effective in these disorders, Vilter, Schiro and Spies[5] administered pyridoxine intravenously to three pellagrins and two patients with pernicious anemia in relapse. Improvement was noted within 48 hours, and although there was only a 5 per cent. reticulocyte response, there was a striking increase in the leucocyte count, especially in the granulocytic series. Goldman and Malvados[6] report somewhat similar observations in bone marrow studies on three cases of Cooley's anemia when pyridoxine was used in association with pregnancy urine hormone. These findings led us to attempt the treatment of leucopenia and granulocytopenia using intravenously administered pyridoxine hydrochloride.

The material used was a 10 per cent. solution of pyridoxine hydrochloride in physiological sodium chloride. Three cases of agranulocytic angina were studied. The precipitating factor in the first instance was 4.0 grams sulfathiazole given over a period of 24 hours. In the second instance there was no medication apart from self-administered aspirin. The third case followed the use of thiouracil and developed about two months after this therapy for hyperthyroidism was instituted. A total of 13.5 grams of the drug had been taken.

In the first instance noted, leucopenia and granulocytopenia persisted despite repeated blood transfusions and pentose nucleotide in large doses. The second case received one blood transfusion without apparent effect. The third case received only pyridoxine. Pyridoxine hydrochloride was administered in doses of from 125 mgm to 200 mgm intravenously daily. The temperature in each case fell to normal limits and symptoms disappeared within 48 hours. This was associated with a leucocyte increase and the reappearance of granulocytes in the blood. Therapy was continued for from five to six days and blood examinations performed for varying periods thereafter. The findings at two-day intervals for the first ten days after commencing pyridoxine therapy are recorded in Table 1. A full report is in preparation and will be published elsewhere.

TABLE 1

Days after first dose of pyridoxine HCl	Case 1		Case 2		Case 3	
	W.B.C.	Gran. Per cent.	W.B.C.	Gran. Per cent.	W.B.C.	Gran. Per cent.
0	2,850	0	6,400	0	4,300	6
2	8,050	44	7,050	8	5,400	30
4	19,150	67	10,900	27	8,400	53
6	23,750	43	21,300	61	7,750	68
8	28,500	59	29,300	61	7,800	75
10	27,900	64	18,000	78	9,100	66

Our results suggest that pyridoxine hydrochloride administered intravenously is a useful agent for the treatment of agranulocytic angina of toxic origin. Its effectiveness in three instances arising as a result of toxicity due to three chemically unrelated drugs suggests that pyridoxine acts by direct stimulation of the myelocytic elements of the bone marrow.

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SUMMER UPWELLING—NORTHEAST COAST OF FLORIDA

DAILY surface water temperatures, taken for a number of years in connection with sea-level studies at U. S. Coast and Geodetic Survey primary tide stations, disclose an interesting anomaly in summer temperatures along the Florida northeast coast in the vicinity of Daytona Beach.

Southerly winds prevail in July and August, causing an offshore transport of surface water which is replaced by the colder subsurface waters of the Florida Current, the western edge of which is 25 nautical miles from shore at this latitude. That the water area thus cooled is comparatively extensive is indicated by the displacement of the air temperature-latitude curves for the months of July and August. By September the prevailing wind is northeast and the temperature of both surface water and air returns to normal for the latitude.

The full line curves in Fig. 1 show the mean monthly surface water temperatures for July, August and September, and are based on observations at Charleston, Savannah, Daytona, Miami and Key West. The light symbol shows the mean monthly surface water temperatures as observed at Diamond Shoal Light-

[2] S. S. Spicer, F. S. Daft, W. H. Sebrell and L. L. Ashburn, *Public Health Reports*, 57: 1559, 1942; F. S. Daft and W. H. Sebrell, *ibid.*, 58: 1542, 1943.
[3] Leading article, *Nut. Rev.*, 2: 103, 1944.
[4] P. J. Fouts, O. M. Helmer and S. Lepkovsky and T. H. Jukes, *Jour. Nutrition*, 16: 197, 1938.
[5] R. W. Vilter, H. S. Schiro and T. D. Spies, *Nature*, 145: 388, 1940.
[6] L. M. Goldman and A. Malvados, *Jour. Clin. Endocrin.*, 1: 945, 1941.