min A contained in their blood.[1] Pett,[2] using his instrument for testing vitamin A deficiency visually in human subjects, has observed unaccountably short recovery times in dark adaption the day following taking of alcohol. This he considers due to an increase in blood vitamin A.

We have made a few preliminary observations on the vitamin A content of the blood in human beings before and after taking alcohol. The Carr-Price colorimetric method, modified by Clausen, was used for these determinations.

The conditions under which the alcohol was taken was the usual "social" evening drinking common in this country. The alcohol was in the form of mixed drinks taken by each subject as desired during the evening.

TABLE I

Subject	Age	Sex	Weight (lbs.)	Amount of alcohol (95%)	Evelyn photoelectric units of vitamin A per 100 Ml of serum*		
					Basal	Four hours after alcohol	Twelve hours after alcohol
A	35	M	170	135 cc	33.8	42.1	42.9
A				145 cc	47.6	50.0	46.6
B	30	M	160	162 cc	93.4	217.7	76.5
C	35	M	160	150 cc	30.5	45.3	41.7
D	31	M	170	126 cc	50.8	54.3	48.3
E	36	F	120	54 cc	40.5	42.2	40.7
F	30	M	240	216 cc	57.0	59.8	48.2
G	29	F	150	261 cc	48.4	60.1	39.5
						Two hours	
H	35	M	160	20 cc	37.8	38.7	
I	33	M	150	20 cc	60.3	62.2	

* One Evelyn Photoelectric unit of vitamin A is approximately equal to three international units of vitamin A.

Blood samples were drawn before the ingestion of alcohol, at the end of the evening (approximately four hours after the first drink) and the following morning (approximately 10 to 12 hours after the ingestion of alcohol).

In every case there was some elevation in the amount of vitamin A in the blood after taking alcohol. Although the increase in most cases was relatively slight, in subject B, whose initial vitamin A content of the blood was extremely high, the rise was also remarkably large. This subject had not been taking any vitamin A concentrates previous to the experiment. The high concentration in the blood suggests that his tissues also contained large amounts of the vitamin.

COMMENT

These findings show that the ingestion of alcohol raises the vitamin A content of the blood of man. We feel that this rise in the blood is probably due to a shift of vitamin A from other tissues of the body, notably the liver, to the blood. Further work will be necessary to determine what factors determine the degree of rise in the blood. Probably the amount of alcohol ingested and the degree of saturation of the body with vitamin A are important factors. Possibly tolerance to alcohol may also be a factor. This effect of alcohol on mobilizing vitamin A from the tissues might form the basis of a test for vitamin A storage in the body.

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[1] S. W. Clausen, *et al.*, SCIENCE, 91: 318.
[2] L. B. Pett, SCIENCE, 92: 63.

ULTRAVIOLET TRANSMISSION BY THE VITELLINE MEMBRANE OF THE HEN'S EGG

THAT the developmental behavior of chick embryos may be altered by exposure to ultraviolet radiation, even when irradiated through the shell or the shell membrane, has been reported by several workers.[1, 2, 3]

It has been shown by Sheard and Higgins[1] and Landauer[2] that the shell may transmit some radiation as short as 2,800–3,000 Å, although perhaps less than one per cent. Absorption by the albumen was not measured by them, although it constitutes an important factor from the absorption view-point.

Hinrichs[3] removed a part of the egg shell and shell membrane and exposed the blastoderm directly to the radiation, which meant that the vitelline membrane (and possibly a very thin layer of albumen) still acted as a filter to the underlying embryo. Although the transmission by the vitelline membrane was not measured, Hinrichs was convinced that it did not effectively shield the embryo from the ultraviolet radiation.

However, in any attempt to correlate quantitatively the effects produced as a function of wave-length with the absorption spectrum of the substance responsible for the behavior in question, it is essential to have numerical data on the ultraviolet transmission by this membrane. It was in connection with an investigation of this kind, to be reported elsewhere by Mr. James O. Davis, that the measurements now reported were undertaken.

An unincubated egg (New Hampshire breed) from the University of Missouri Poultry Farm was opened, and the yolk placed on a watch glass. The vitelline membrane was cut half-way around at the equator

[1] C. Sheard and G. M. Higgins, *Jour. Exp. Zool.*, 57: 205, 1930.
[2] W. Landauer, *Storrs Agric. Exper. Sta. Bull.*, No. 179. 1932.
[3] M. Hinrichs. *Jour. Exp. Zool.*, 47: 309, 1927.

so that the contents of the yolk escaped. The membrane was removed, washed four times in distilled water, and mounted in glycerol between two crystal quartz microscope slides. The preparation was then

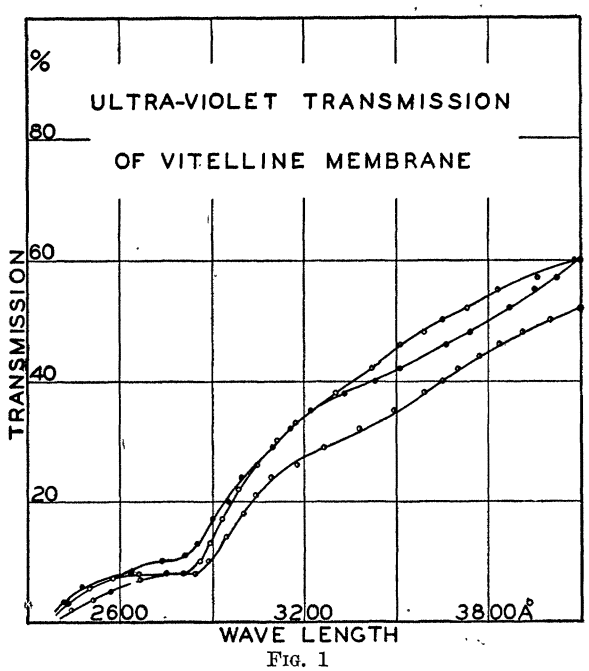

FIG. 1

sealed at the edges with paraffin. Owing to the natural spherical contour of the vitelline membrane, it was not possible to avoid folds entirely when placing it between flat slides; however, the fractional area covered by such folds was estimated to be considerably less than 10 per cent. of the total area of the membrane in the light path.

Transmission measurements were made with a Spekker photometer and a Hilger medium quartz spectrograph. A control consisting of a 10 micron layer of glycerol between another pair of similar crystal quartz slides was employed. The results are shown in Fig. 1, where the per cent. transmission is plotted as a function of the wave-length for each of three separate trials.

It will be noted that selective absorption occurs in the region around 2,800 Å. Since these membranes scatter light noticeably in the visible, it is to be expected that they would do so more strongly in the ultraviolet and that scattering would be responsible in large measure for the low transmission at 4,000 Å. That this is true was demonstrated in an attempt to measure the transmission with a quartz microscope and photocell, in which case the transmission was observed to increase greatly with increased numerical aperture of the objective. To account for the absolute differences in transmission between the three sets of measurements, one must consider natural fluctuations in thickness and possibly variations in membrane composition. It is intended that these results will call attention to the order of magnitude of the transmission; in any given irradiation experiments, it would probably be necessary to make measurements on the particular egg samples employed.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE APPARATUS FOR PRESSURE FILTRATION

THE sterilization of protein solutions by Seitz filtration using positive pressure requires a motor, a pump and a tank, all of which are expensive for the small laboratory in which they may be needed at infrequent intervals. Suction produced by water aspiration is slow and noisy and, in addition, since protein solutions foam under reduced pressure, requires "venting" of the system with its possible contamination. We have, in this laboratory, devised a simple, inexpensive instrument suitable for the small laboratory in which there is no compressed-air system.

The tank consists of a single length of six-inch-diameter pipe capped at both ends. One end serves as a base. The other end is pierced by ordinary iron pipe into which is threaded a pressure gauge and two outlets. To one outlet is fixed a tube ending in an automobile tube valve stem. Through this, using a bicycle pump, the tank can be charged. To the other outlet is fixed a piece of fabric-covered pressure tubing ending in an automatic air chuck of the type used on air hoses with which tire tubes are inflated. The pressure cap of the Seitz filter is fitted with a standard valve stem which fits the automatic valve chuck of the tank. The exact details are shown in Fig. 1.

Since the length of fabric-covered tubing may be varied, the tank can be placed in any convenient part of the laboratory. Seitz filters can be set up in groups and several filtrations done at the same time. As filter pads become clogged, the pressure in the tank may be increased so that the rate of filtration is constant. The pressure in the tank can be raised by the pump while filtration is taking place.

Certain details of operation must be given special consideration. Before filters are autoclaved, the pads must be moistened, centered exactly and screwed firmly into place. After sterilization, the screw must be tightened mechanically by pliers. If the pad is loose, or if it is not centered, some fluid may be forced