while the benzoic acid procedure gives better results with the luteinizing hormone,** when these methods are applied to urine. Our experiments indicate that the aluminum hydroxide method leads to a recovery of at least 60% of the F.S.H. originally present in the urine.

The above described method has been satisfactorily used for daily determinations of the amount of F.S.H. excreted in the urine of more than 150 patients suffering from various mental and nervous diseases. Various physiological and clinical aspects of the findings will be discussed in a detailed report which is being prepared for publication in the *Psychiatric Quarterly.*

The investigations are being continued.

8372 C

Influence of Ultra Violet Irradiation on Clam Heart Subjected to Potassium Excess.

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This investigation was undertaken in an attempt to determine the effect of ultra violet on tissue subjected to potassium excess. For this purpose the heart of the clam, *Venus mercenaria,* was used.

Records were obtained of the ventricular beat of the heart *in situ.* A small hook, made of glass capillary tubing, was inserted into the apex of the ventricle and, by means of a thread attached to the hook and a light balanced lever (a drinking straw), records were obtained on a moving kymograph. The clam, on the half shell, was placed in a finger bowl which was filled with sea water. To this the desired amount of potassium chloride was added.

The ultra violet source was a Cooper-Hewitt Uviarc (6-inch tube with reflector and running at 110 volts D. C.) placed at 35 cm. from the preparation. A thermopile, with a blackened couple, at the heart, served as a temperature index. The sensitivity of the galvanometer enabled temperature changes of 0.01°C. to be observed. During all of the experiments the temperature changes were negligible. Room temperature varied from 22 to 27°C. During the course of an experiment the temperature both of the room and of the heart

** Antuitrin-S was used as the source of L.H. We are indebted to Dr. Oliver Kamm of Parke, Davis and Co., for considerable quantities of this material.

never changed more than one degree Centigrade from the beginning of the experiment to the end. Temperature rise during irradiation never exceeded 0.3°C.

Short ultra violet irradiation (2-3 min.) of the clam heart appears to cause a marked increase in tonus, a definite decrease in amplitude, but does not affect the pace maker.

Experiments were performed with potassium chloride concentrations up to 2.7% in sea water. When concentrations above 1.36% potassium chloride were used ultra violet (1-2 min.) did not always restore a rhythm. This was the case in 3 experiments out of 20. The preparations were then thoroughly washed in sea water. Neither this nor mechanical stimulation was effective in restoring a rhythm. When the foot was stimulated mechanically it did not respond. It is probable that in these 3 experiments the tissue had been killed by excess potassium. This leads me to believe that approximately the maximum concentration of potassium was employed during the course of this investigation and that ultra violet irradiation is effective in overcoming potassium which is present in these concentrations. The amounts of potassium were so great that the solutions employed were hypertonic. This hypertonicity caused a marked increase in tonus and ultra violet was also able to overcome this. Thus it appears that ultra violet irradiation may alter the potassium-calcium equilibrium.

Lieber[1] studied, by micro-chemical methods, the distribution of potassium and calcium in the skin of white rats and guinea pigs and found a potassium excess in the hair follicles and in the depths of the epidermis. Following X-ray treatment he reports that the potassium in the vicinity of the hair follicles practically disappears. Calcium was found to be redistributed to occupy the region where the potassium excess originally appeared, *i. e.*, the follicles and depths of epidermis. Adler and Wiederhold[2] reported partial disappearance of potassium from blood serum which was X-rayed. Numerous investigators, Lepeschkin[3] on blood erythrocytes, Lepeschkin,[4] Blackman and Paine,[5] and Tröndle[6] on plant cells, have reported an increase in permeability after ultra violet treatment. It appears that somehow an increase in permeability occurs and pos-

[1] Lieber, G. D., *Strahlentherapie*, 1925, **20**, 93.

[2] Adler, K., and Wiederhold, O., *Strahlentherapie*, 1932, **44**, 383.

[3] Lepeschkin, W. W., *Protoplasma*, 1933, **18**, 243.

[4] Lepeschkin, W. W., *Am. J. Bot.*, 1930, **17**, 953.

[5] Blackman, V., and Paine, S. G., *Ann. Bot.*, 1918, **32**, 69.

[6] Tröndle, A., *Jahrb. wiss. Bot.*, 1910, **48**, 171.

sibly a shift in potassium-calcium equilibrium takes place. The potassium is enabled to leave the cell and calcium may go in and thus enable a normal equilibrium to be attained. It is quite possible that this physical shift is, in part, able to account for some of the biological effects of ultra violet.

8373 C

Notes on the Weil-Felix Reaction in Individuals not Suffering from Typhus.

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In view of the increasing frequency with which the Weil-Felix reaction is being used in the United States for the diagnosis of obscure fevers suspected of Rickettsia origin, and especially because of our own interest in the possibility of latent typhus infection in individuals infected a long time ago, we undertook to carry out a considerable number of Weil-Felix reactions on individuals not at the time suffering from typhus or fevers of any kind, for the purpose of establishing the significance of low titre reactions. We are reporting these briefly because they seem to us helpful in appraising occasional doubtful cases.

The reactions were carried out on sera from several groups of subjects. One group was composed of Jewish out-patients furnished us by the Beth Israel Hospital Clinic in Boston, and in these record was made as to whether the individual was born in Russia or in the United States. Since such information had no significant effect on these observations, we abstain from tabulating it. Another

TABLE I.
Weil-Felix Reactions.

Material	Total No.	Positive Reactions 1-20	1-40	1-80	1-160	% of Positives 1-20 or over %
Jewish patients, Beth Israel Hospital	123	7	10	7	1	20+
Non-Jewish patients	242	18	19	10	1	19+
Routine Wassermann sera	207	25	18	6	2	24+
Russian-born garment workers	24	0	2	2	0	17+
Totals	596	50	49	25	4	21+