TABLE I.

Protocol of Dogs Showing the Nature of Results Obtained.

Time A. M.	Temp. °C.	Ether in 100 cc. Arterial Blood cc.	Ether in 100 cc. Arterial Blood mg.	Air cc.	Remarks.
Dog A.					
10:45	39	....	.....	.....	Dog anesthetized.
11:02	39.1	41	136	6.63	Very slight corneal reflex.
11:18	39.3	32	106	4.50	Corneal reflex.
11:24	....	....	.....	.....	Ether concentration increased.
11:35	39.6	38	126	7.63	Arterial blood dark. No corneal reflex.
11:46	39.8	36	119	6.06	Arterial blood dark. No corneal reflex.
11:53	....	....	.....	.....	Ether concentration increased.
12:00 M.	39.7	43	142	8.67	Respiration shallow. Arterial blood dark. No corneal reflex.
Dog B.					
A. M.					
10:00	39.0	....	.....	.....	Dog anesthetized.
10:48	39.2	....	.....	5.11	Corneal reflex.
10:56	39.2	....	.....	4.31	Corneal reflex.
11:04	39.4	28	93	3.40	Corneal reflex.
11:12	....	....	.....	.....	Ether concentration increased.
11:18	39.5	32	106	5.70	Corneal reflex.
11:26	39.6	31	103	4.35	Corneal reflex.
11:37	39.6	31	103	4.57	Corneal reflex.
11:52	....	....	.....	.....	Ether concentration increased.
11:57	39.8	42	139	6.92	Quieter resp. Slight corneal reflex.
P. M.					
12:06	39.9	32	106	6.55	Slight corneal reflex. Arterial blood dark.
12:18	40.0	31	103	5.38	Corneal reflex.

43 (2275)

The absorption of digitalis from the rectum in man.

By ROBERT L. LEVY.

[*From the Department of Medicine of the College of Physicians and Surgeons, Columbia University, and the Presbyterian Hospital, New York City.*]

Not infrequently, patients suffering from heart failure are unable to take digitalis by mouth because of nausea, vomiting or surgical operation. The margin of safety between therapeu-

tic and toxic dose, when a member of the digitalis group is given by vein, is sufficiently small to render this method of administration hazardous. The present study was undertaken to ascertain the feasibility of rectal digitalis therapy, concerning which only a few fragmentary reports have been recorded.

Twenty-six observations were made on 20 patients with auricular fibrillation. Hourly records of heart and pulse rates were charted for 8 hours after the drug was given and at 4 hour intervals for the next 24 hours. In 19 instances, an electrocardiogram was taken just before administration and approximately every hour thereafter for 3, 4, or 5 hours. Another graphic record was made the following morning.

The preparation employed was an aqueous extract of digitalis leaves furnished by Merck and Company and called by them "Digitan." One cubic centimeter of the liquid contained the equivalent of 0.1 gm. of powdered leaf. Biologic assay was done by the 1 hour frog method.

The patient received a preliminary cleansing enema. After evacuation, 8 to 20 cc. of digitan were given by rectal tube and washed through with 25 cc. of water. The micro-enema was retained. Alcoholic extracts of digitalis were found to be irritating to the rectal mucosa unless diluted to such volume that, because of bulk, they were often expelled.

Retardation in ventricular rate occurred in every instance following digitalis administration. The average time necessary for an unmistakable initial effect on rate was 2 hours and 35 minutes. The interval ranged from 1 hour and 15 minutes to 7 hours and 40 minutes. The average time which elapsed before a maximal effect on rate was apparent was 9 hours and 30 minutes. This time ranged from 3 hours and 15 minutes to 22 hours.

A characteristic change in the T-wave of the electro-cardiogram occurred in 14 of the 19 observations. In 5 cases, no change was observed. The initial effect was seen, on an average, in 2 hours and 30 minutes; this was approximately the time necessary for a beginning fall in rate. This period varied in length from 1 hour and 20 minutes to 5 hours and 15 minutes. Usually, a greater change in the T-wave was seen in the curves made the following morning.

A desirable therapeutic effect was apparent in every case. In many of the patients, the results were dramatically rapid and

beneficial. On two occasions there was nausea and vomiting. There were no other evidences of untoward digitalis action. A detailed report of the clinical aspects of this study will shortly be made.

44 (2276)

Experimental production of rickets with diets of purified food substances.

By THOMAS B. OSBORNE, LAFAYETTE B. MENDEL and EDWARDS A. PARK.

[*From the Laboratory of the Connecticut Agricultural Experiment Station, the Sheffield Laboratory of Physiological Chemistry and the Department of Pediatrics, Yale University, New Haven, Conn.*]

The possibility of producing experimentally in animals symptoms essentially identical with those associated with rickets in human beings promises to advance the study of this disease greatly. The efforts in this direction have hitherto been concerned with the effects of diets of varied composition—usually for the most part mixtures of natural foods or materials derived therefrom without much manipulation. This has made comparisons between different rations somewhat difficult and often unconvincing because with a change in the natural foods several chemical ingredients are altered at the same time and consequently the cause of any marked change induced thereby in the animal usually cannot be charged directly to changes in any one chemical factor. For example, Sherman and Pappenheimer have demonstrated that rickets is brought about in a few weeks in rats by a diet of patent flour 95 per cent plus a mixture of three inorganic salts (Ca lactate 2.9 per cent, NaCl 2.0 per cent, Fe citrate 0.1 per cent). In experimental feeding tests under otherwise comparable conditions we found that the introduction of 10 per cent of a protein (lactalbumin was used) to replace an equal weight of flour in the Sherman-Pappenheimer ration increased the severity of the symptoms. The calorie value of the