

finished drinking the water, the T wave which had been diphasic in the first lead, became positive and remained positive for twelve hours and eighteen minutes. During this time the patient had not ingested any food or fluid. Twenty hours and fifteen minutes after ingesting the water, he was given 300 c.c. of fluid. The form of the electrocardiogram made immediately after this showed its form to be the same as that of the control.

The second patient is one suffering from hypertrophy of the heart and arterial disease. He was given the same test as the preceding patient. The control electrocardiogram showed in the third lead a diphasic T wave, the positive part of it being of greater amplitude than the negative part. Five minutes after the patient had finished drinking the water (twenty minutes after the beginning of the test), the T wave had become wholly negative. The T wave remained negative for sixteen hours and thirty-five minutes, when it became diphasic. This change occurred without the patient having had additional fluid. On another occasion, this patient was given two hot packs and showed the same variation in the third lead. He lost 0.95 kg. He then drank 200 c.c. of milk. The electrocardiogram now resumed the form of the control.

This test has been made on a normal man, in whom no qualitative change occurred.

In the above tests the resistance of the patients varied from 800 to 1,300 ohms, except once when the resistance was 2,000 for each of three leads and on two other occasions when it lay between 1,600 and 1,700 in each of three leads.

*Conclusion:* Bleeding, hot packs, ingestion of water and fasting may in certain persons affect the form of the electrocardiogram.

44 (1222)

### **The influence of ergotoxin on the pupil of the rabbit.**

By **T. S. GITHENS.**

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In the very careful studies of Dale on the pharmacodynamic action of ergotoxin, it is stated, without qualification, that this

drug causes a contraction of the pupil. His studies were made on cats.

I have found that in rabbits, ergotoxin produces exactly the opposite effect. That is to say with all doses a dilatation of the pupil lasting several hours results. With doses of 1 mg. per kilo, which did not cause any marked general intoxication, the pupil dilated to  $7\frac{1}{2}$  mm. from an original size of 5 mm. With doses of 2 mg. per kilo, the pupil reached a size of 9 to 10 mm. All injections were in the ear vein.

These larger doses cause a certain amount of disturbance of the respiration, and it might be claimed that the dilatation was due to asphyxia. In fact Dale ascribes a dilatation mentioned by Kobert in a protocol, to this cause. In order to exclude this factor I curarized a number of rabbits and under artificial respiration, injected ergotoxin. The heart was not markedly disturbed, but the dilatation of the pupil was even greater than in most of the normal animals.

We may then assume that the dilatation seen in the rabbit's pupil is not secondary to asphyxia but is due to the action of the drug itself.

Dale states that ergotoxin exerts two distinct actions on the sympathetic nervous system. First a stimulation of the muscle fibers of certain organs, notably the uterus. Second a paralysis of the motor myoneural junctions of the true sympathetic. It is to the latter action that the constriction of the cat's pupil is said to be due. It is possible either that ergotoxin acts in a different manner in the two species, or that the first action, direct stimulation of the muscle fibers is exerted on the dilator muscle of the rabbit's pupil and overcomes the effect of paralysis of the myoneural junction. The view that ergotoxin acts at least in part, directly on the muscle fiber, is perhaps favored by the occurrence of dilatation from ergotoxin, in two rabbits which were anesthetized with ether until the light reflex was abolished.

That the action of ergotoxin is not exerted on any more central structure of the dilating mechanism is proved by the fact that its action is little influenced by ganglionectomy.

I recently reported that in rabbits, ergotoxin caused a very marked rise of temperature. That the pupil dilatation is not

associated with this, is shown by the fact that the dilatation reaches its maximum within 15 minutes, at a time before the temperature has begun to rise. It is of interest to note, however, that the two seemed almost always to parallel one another. The wider the dilatation of the pupil, the higher was the subsequent fever.

45 (1223)

**The excretion of Congo red by the stomach.**

By **R. L. CECIL** and **R. WEIL**.

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The excretion of dyes by the stomach has not as yet been studied in human beings, and even in animals has been investigated only to a very slight extent. Abel found that phthalein dyes were not excreted by the stomach in animals. For several years we have been engaged in the study of the diazo dyes, one of us<sup>1</sup> having paid particular attention to the effects of Congo red when injected intravenously into human beings. The present communication gives a preliminary report on the excretion of Congo red by the human stomach in conditions of health and disease. We have injected up to one gram intravenously into human beings and found that the normal stomach fails to excrete the dye, except in very small amounts, even when these maximal doses are used. As a matter of routine, we have injected 0.3 or 0.4 gm. in normal salt solution.

One of us has shown that anilin dyes, when injected intravenously, may be discovered in the secretions of external ulcers and of ulcerated cancers. With this fact in mind, it seemed advisable to examine cases of gastric ulcer and cancer after intravenous injections of Congo red. We have found in a limited series of such cases, that, as a matter of fact, the dye may generally be demonstrated in relatively considerable quantity in the stomach contents. It is not in solution, but upon filtration is deposited upon the filter paper. Microscopically, granules of the dye can be detected

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<sup>1</sup>Weil, R., *Jour. of Cancer Research*, 1916, I, 1.