sights are dissimilar to the extent of preventing fusion, or when the left or right reticle beam is adjusted to yield a vertical displacement between the two reticle images, the ranging task may become one of either binocular summation or interocular vernier acuity (i.e., vergence of the right reticle beam results in phenomenal movement of the right reticle image in the right-left dimension only). The on-target condition in this case occurs while fixating the target with the phenomenal achievement of the particular geometric configuration used (e.g., the vertical alignment of the two reticle images of the two vertically displaced reticle beams).

It may have been noted that the instrument described above provides for vergence of the right reticle beam only. With such asymmetrical vergence, the fused reticle image in the stereoptic task appears to move obliquely from far-right to near-left, and vice versa. Were the left reticle beam the verging system, this apparent motion would be on a near-right to far-left oblique, whereas with symmetrical vergence the fused reticle image would appear to move radially in depth. It would seem desirable to have an instrument which would provide symmetrical vergence of both reticle beams as well as asymmetrical vergence of either. Such an instrument is under construction at this laboratory.

Manuscript received November 6, 1952.

Studies on the Uricase Activity of Rats Fed *p*-Dimethylaminoazobenzene

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An attempt was made in this paper to investigate the uricase activity of rats in the course of liver-cancer production by *p*-dimethylaminoazobenzene (butter yellow) feeding. The rats were fed *p*-dimethylaminoazobenzene for 120 days by the method of Kinoshita (*1*). This was continued for an additional 2–3 weeks with the basal diet free from the dye. After this both sexes of 14 albino rats were killed by exsanguination within a week. The livers were classified macroscopically according to the suggestion of Nakahara *et al.* (*2*) into four groups: macroscopically normal, uneven surface, cirrhotic, and liver cancer. As a control group, both sexes of 10 albino rats were fed with basal rice diet. Water intake was ad libitum and green vegetables were supplied twice a week.

To estimate the uric acid consumed, Benedict's direct method was adopted. Enzyme solution was prepared as follows. A piece of liver tissue, weighing exactly 1 g, was ground in a mortar and thoroughly extracted with 10 ml of borate buffer solution (pH 8.5), and centrifuged at 3000 rpm for 5 min. To 0.5 ml of this extract, 2 ml of borate buffer containing 0.4 mg of uric acid and 20 ml of borate buffer was added. After adding 0.5 ml of toluene, each test tube was stoppered tightly and incubated at 37° C for 6 hr. After the incubation, to 5 ml of this solution was added 4 ml of 1/12 *N* sulfuric acid, and 0.5 ml of 10% sodium tungstate solution (Folin-Wu's precipitation method), in succession, after which the solution was filtered. To 5 ml of the filtrate, 4 ml of sodium cyanide solution and 1 ml of arsenophosphotungstic acid was added, the test tube was placed in a boiling water bath for 3 min, and it was then left at room temperature for about 2 min and finally subjected to photocolorimetry.

TABLE 1

URICASE ACTIVITY OF THE LIVER OF RATS IN THE COURSE OF LIVER CANCER PRODUCTION (37° C, 6 HR).

Liver findings	No. of examples	Uric acid consumed (mg %)*	Uricase activity†
Normal liver (controls)	10	0.312 (0.276–0.369)	100
Experimental group macroscopically normal liver	10	0.390 (0.356–0.432)	125
Uneven surface liver	4	0.357 (0.285–0.414)	114
Cirrhotic liver	6	0.294 (0.227–0.359)	94
Liver cancer	6	0.072 (0.041–0.098)	23

* Figures given as averages and ranges.
† Value for normal taken as 100.

All data are summarized in Table 1. It is clearly seen in the table that the degrees of uricase activity of the livers which showed macroscopically normal and uneven surfaces were 125 and 114 respectively, whereas the activity of the normal liver reached just 100. The uricase activity of the cirrhotic liver was 94, and that of the liver cancer was only 23. This indicated that the uricase activity of rat liver was evidently increased when the pathological change in the liver was not recognized or not remarked. But, when the liver tissue became cirrhotic, the uricase activity became less remarkable than the above and almost the same as normal. It is noteworthy that when the liver tissue became cancerous, the uricase activity dropped to only a quarter of normal.

Conclusions. It was demonstrated that the uricase activity of rat liver increased once at the early stage of liver change and then decreased at the cancerous stage in the course of liver-cancer production. Uricase contains iron in the molecule as catalase does. Drastic decreases in the activity of catalase of mice and rats by tumor implantation were demonstrated by several workers (*3*), especially Greenstein (*4, 5*). And the significance of this enzyme has become more prominent in cancer research since the discovery of toxohormone by Nakahara and Fukuoka, who have shown that the extraction of a fraction with low molecular weight from tumors which, when injected intraperitoneally, lowered liver catalase activity of normal mice (*6, 7*).

One of the authors reported (*8*) that the liver catalase has the same influence on the activity as the uricase described above in the course of carcinogenesis. Uricase is found only in the liver tissue of mice and rats. No investigation of uricase has ever been demonstrated in the research in experimental cancer production.

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Manuscript received November 13, 1952.

Circulatory and Autonomic Factors in Bulbar Facilitation and Inhibition of Reflexes[1]

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The close association of autonomic effects and bulbar and diencephalic facilitation and inhibition of the patellar reflex has been pointed out previously (*1–4*). It appeared desirable to determine whether bulbar facilitation bears any relation to the well-known Orbeli phenomenon, which involves enhancement of the muscular contraction evoked by direct motor nerve stimulation when the sympathetic supply to the muscle is simultaneously stimulated.

Cats were anesthetized with Nembutal (30 mg/kilo) and were prepared as illustrated in Fig. 1. In some experiments only one hind limb was used, and in other experiments both hind limbs were prepared as follows. Steel pins were drilled into the extremities of the femur so that a very rigid fixation of the limb could be arranged. The iliopsoas muscle was sectioned, and the saphenous and sartorius branches of the femoral nerve and the whole sciatic trunk and its hamstring branches were divided. In one leg the quadriceps branch of the femoral nerve was also sectioned to provide a distal stump for direct stimulation of the motor nerve to the quadriceps muscle by means of shielded electrodes. The other limb was so arranged that the knee jerk could be recurrently elicited by a rhythmically actuated solenoid.

The reticular formation of the brainstem, the posterior hypothalamus, and the mesencephalon was explored with stereotaxically oriented concentric electrodes. Stimuli consisted of 60-cps pulses of approximately 10-sec duration with a strength of 5–10 v. The femoral motor nerve-quadriceps muscle preparation was rhythmically stimulated through the distal stump of the nerve by means of 0.1-v sine wave applied at the rate of 1/sec. Blood pressure, when recorded, was taken from the carotid artery, and drug infusions were administered through in-dwelling needles in the external jugular vein. The femoral artery and adrenal veins were exposed for clamping, the lumbar sympathetic chains were loosely ligated for later avulsion, and the upper lumbar cord was exposed through the dura and a loose ligature applied for later severance at L1.

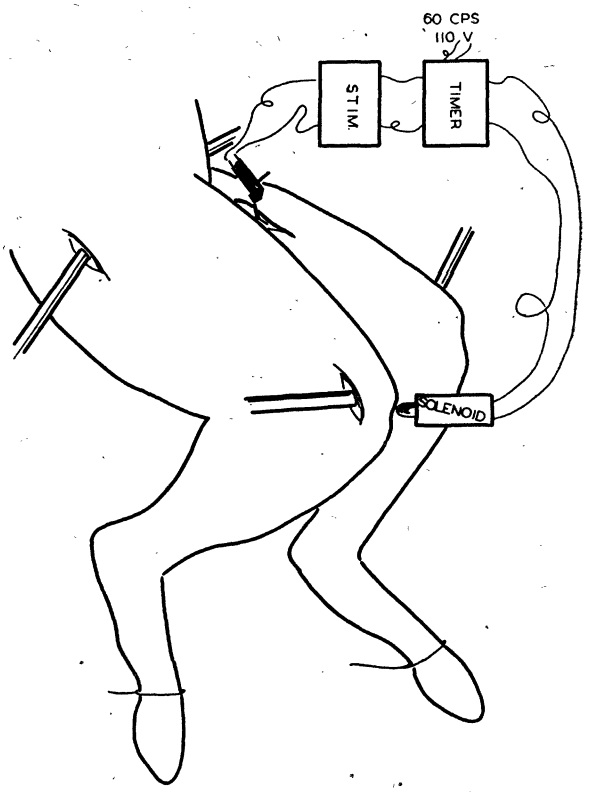

FIG. 1. Schemata of cat preparation. Both hind limbs are rigidly fixed by steel pins drilled into the extremities of the femurs. A rhythmically actuated solenoid activates the patellar reflex on one side which has been completely denervated with the exception of the quadriceps branch of the femoral nerve. The other side has been completely denervated, and the distal stump of the quadriceps branch of the femoral nerve is enclosed in shielded electrodes which recurrently stimulate the motor nerve fibers.

The first experimental procedure attempted was to determine the effect of surgical interference with the sympathetic supply to the limb on bulbar facilitation of the knee jerk. Figure 2A shows mesencephalic facilitation of the knee jerk, and Fig. 2B shows abolition of the response after bilateral resection of the lumbar sympathetic chains and clamping of both adrenal veins. The second procedure involved pharmacologic interference with sympatholytic drugs subsequent to, during, and preceding bulbar facilitation of the knee jerk. Figure 2C shows bulbar facilitation

[1] Supported by a grant from the Louisiana Heart Association.

[2] With the technical assistance of S. M. Olivier.