In fraction 1 the electrophoretic starting point of the labelled serum was included. This may account for the fact that here the ^{59}Fe-activity was significantly higher than in the fractions 3, 4 and 5. Fraction 2, which contained the transferrins, had the highest counting rate per 1% protein and was significantly different from all the other fractions. Fraction 3, the object of our investigation, had the same activity per protein content as fraction 4 and 5.

From these results it could be concluded that the sex-specific fraction 3 in the female animals was not a part of the transferrin bands.

Summary. Sex-specific differences with regard to the intensity of transferrin bands were observed in a non-inbred adult mouse population after separation of the serum proteins by polyacrylamide gel electrophoresis. Amongst the female animals, an additional protein fraction was found just above the position of the transferrin bands. By means of a tracer method, using ^{59}Fe-labelling, it could be shown that the additional fraction is not a part of the transferrin bands.

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Autonomic Control of Renal Portal Blood Flow in the Domestic Fowl

Sperber[1] was the first to demonstrate a functional renal portal system in the domestic fowl; his observations have latterly been extended[2]. The integrity of this system depends on the activity of the renal portal valve which lies at the junction of the renal vein, external iliac vein and inferior vena cava[2]. This valve is composed largely of circularly arranged smooth muscle cells that have been shown, by histochemical techniques, to receive a dense noradrenergic and cholinergic innervation[3–5]. Pharmacological observations on the renal portal valve from the turkey indicate that acetylcholine has excitatory and adrenaline has inhibitory effects[6]. However, there have been no physiological studies on the nervous control of the smooth muscle of the renal portal valve; in the present account, such a study is reported.

Materials and methods. 12-week-old White Leghorn chicks were decapitated under light ether anaesthesia and the renal portal valve from the left side was removed intact. The valve was then slit open and mounted in an organ bath in such a way that contraction of the smooth muscle cells was recorded as a change in length. The tissue was bathed in a physiological saline solution at 37 °C gassed with 95% O_2, 5% CO_2. The nerve fibres within the renal portal valve were stimulated through a pair of platinum wire electrodes arranged either side of the tissue.

Results. The majority of preparations exhibited rhythmic spontaneous activity, superimposed on slow changes in tone (Figure A). This activity appeared to be myogenic since it was unaffected by autonomic drugs. The response of the renal portal valve to nerve stimulation depended on stimulus frequency. At low frequencies (1–2 Hz) there was a marked relaxation of the tissue with little excitatory effect (Figure B). However, with higher stimulus frequencies (4–10 Hz) there was an initial excitatory response followed by a prolonged relaxation. The excitatory re-

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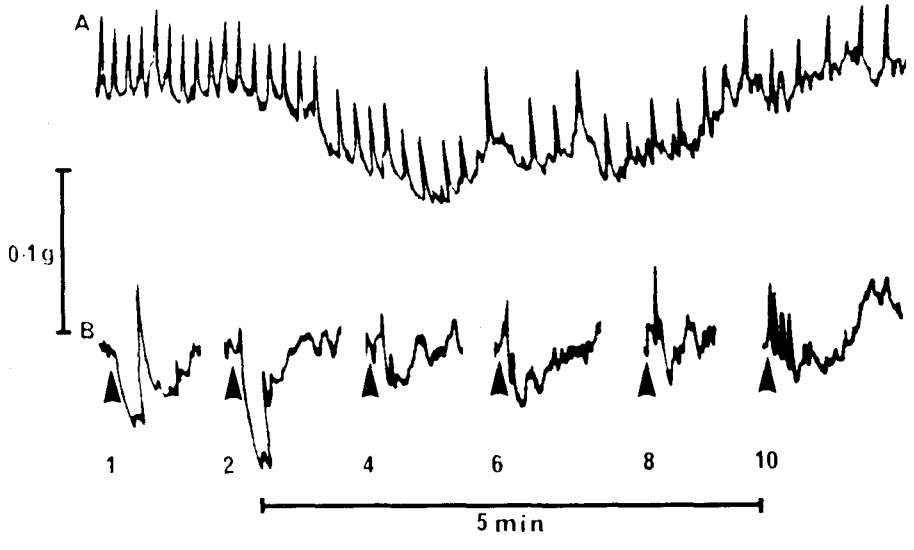

A) Spontaneous activity in the renal portal valve. Note the frequent spontaneous contractions superimposed on the slow changes in tone. B) Responses of the renal portal valve to nerve stimulation (60 V strength, 0.2 msec duration for 10 sec periods) at frequencies of 1 to 10 Hz. Note the predominant relaxatory response at low frequencies and the initial contraction seen with higher stimulus frequencies.

sponse was blocked by hyoscine (10^{-7} g/ml), while the nerve-mediated relaxation was abolished by propranolol (5×10^{-7} g/ml).

Discussion. The present study has provided the first direct demonstration that the renal portal valve in the domestic fowl has an excitatory, cholinergic and a noradrenergic inhibitory innervation. Previous work[2] has shown that, when the renal portal valve is open (i.e. inhibited), blood flows into the inferior vena cava; functional studies[7] have provided evidence that the inferior vena cava receives a dense noradrenergic innervation that causes contraction of the muscle in its walls. The vasomotor control of the vasculature in this region is thus such that a generalized noradrenergic nerve discharge would cause opening of the renal portal valve and hence flow of blood into the inferior vena cava, the capacity of which would be reduced by contraction of its musculature. This would seem to be an efficient means of facilitating venous return. The dual innervation of both the renal portal valve and the inferior vena cava would clearly permit very rapid adjustments in the volume of blood returning to the heart.

Summary. Electrical stimulation of the intrinsic nerves of the renal portal valve of the domestic fowl demonstrated the presence of noradrenergic inhibitory, and cholinergic excitatory fibres. They may be involved in the control of venous return.

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Ultraviolet Light-Induced Miniature End-Plate Potentials in Frog Neuromuscular Junction

Several physico-chemical conditions and biochemical agents have been known to induce an experimental increase in the rate of appearance of miniature end-plate potentials (MEPP)[1-3]. Their contribution to the study of the releasing mechanism of acetylcholine (ACh) vesicles is considerable. Ultraviolet (UV) irradiation has often been used to obtain selective changes in specific cellular components[4,5]. This preliminary communication describes the increase in the discharge frequency of MEPPs following the application of UV light to the frog neuromuscular junction (NMJ).

The experiments were performed on preparations of the sciatic-sartorius NMJ of *Rana nigromaculata*, in a few cases *Xenopus laevis*, at room temperature. The bathing solution had a standard composition of K^+ 2.5, Ca^{++} 1.8, Na^+ 116.5, Cl^- 117.1, $H_2PO_4^-$ 0.45, HPO_4^- 2.55 in m*M*. The MEPPs with a rise-time of 1 msec or less were recorded by the use of 3 *M* KCl-filled microelectrodes of 5–10 MΩ resistance. They were displayed on an oscilloscope through a FET-operating preamplifier. Light, supplied by a mercury lamp of 100 *w*, (USH-102D, Ushio) was focused through a quartz lens. The spectrum range shorter than approximately 300 nm could be removed, when needed, by a glass filter. Recordings were mostly made from relatively deeper fibres after the more superficial ones were removed to ensure more effective irradiation. After identifying and recording the spontaneous MEPPs, the center of the light spot was adjusted to hit the tip of the recording electrode. The size of the spot was large enough to give approximately equal amounts of irradiation to both pre- and post-synaptic elements from which the recording was taken.

From 3–6 min after the onset of continuous application of the unfiltered light, an abrupt and transient increase in the MEPP frequency was consistently produced. When the wave-lengths shorter than 300 nm were cut off by a filter, the increase in discharge frequency could no longer be produced, even after irradiation for 10 min. It follows

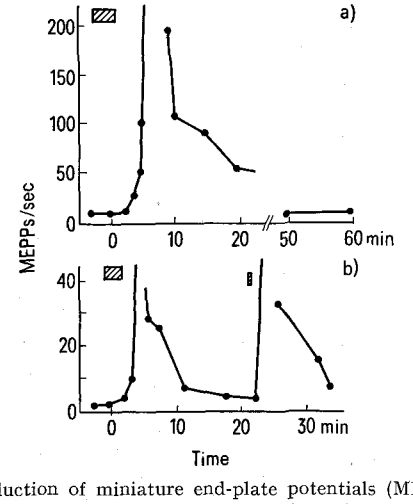

Fig. 1. Induction of miniature end-plate potentials (MEPP) from *Rana* neuromuscular junction by irradiation with UV-light. The UV application time is indicated by the hatched block. a) 4 min; b) 1st application, 3 min; 2nd application, 10 sec.

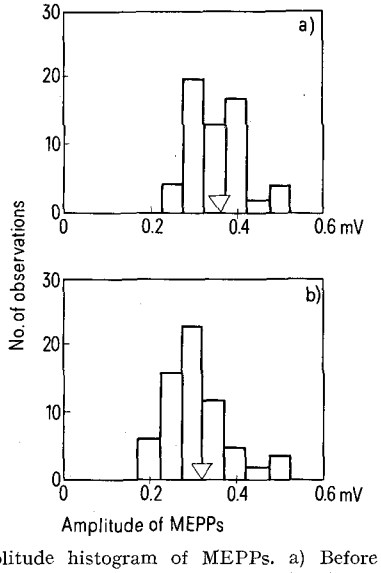

Fig. 2. Amplitude histogram of MEPPs. a) Before irradiation; b) as the MEPP discharge rate was increasing (measurement was started at 4 min after onset of UV application). ▽, Mean value.