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The effect of apomorphine on oral behaviour in piglets

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The new-born mammal has both nutritive and non-nutritive sucking requirements (Levy, 1934). When non-nutritive sucking is prevented, abnormal oral behaviour which can resemble the effect of apomorphine may be induced. The two types of sucking behaviour can be distinguished using equipment described by Stephens (1975). This consists of a wooden box lined with rubber sheeting. A rubber teat is inserted through a hole in one wall. The teat is connected to two microswitches which record teat movements and milk flow through the teat is also monitored. One-day-old piglets can be trained to feed from the teat in three days at which time they develop a regular pattern of teat activity. This consists of an ingestive phase lasting approximately 15 min during which the piglets drink the milk provided. Then follows a period of sporadic non-nutritive teat activity when the piglets nuzzle at or around the teat without drinking. Low doses of apomorphine (0.1-0.2 mg/kg s.c.) injected during the latter phase greatly prolong and intensify the non-nutritive teat activity. This method is useful for quantifying behavioural effects of apomorphine. The responses of other farm animals to apomorphine and other drugs thought to affect central dopaminergic neuron systems will also be shown and compared with abnormal oral behaviour seen under intensive husbandry conditions.

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Measurement of vascular changes in acute inflammatory responses

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Acute inflammatory responses are associated with increases in blood flow and accumulation of plasma proteins within the inflammatory lesion. We have modified existing techniques to measure the vascular changes caused by acute inflammatory stimuli in rat hindpaws. Experiments have been made in male rats, body weight 160-200 g, anaesthetized with urethane (1.25 g/kg i.p.). The inflammatory stimulus was applied to one paw and the other paw served as a control. Paw blood content was measured using [^{51}Cr]-labelled rat red blood cells (approximately 1 μCi) and accumulation of albumin in the tissue using [^{125}I]-labelled human serum albumin (approximately 250 nCi), each injected intravenously 5 min before the inflammatory stimulus. Paw blood and albumin content were expressed as volume in terms of venous blood. Blood flow was measured using [^{85}Sr]-labelled microspheres, 25 μ diameter (3M Company). The microspheres were injected into the left ventricle of the heart via a catheter in the right carotid artery. Blood flow to each hindpaw was expressed as a % of cardiac output and flow to the injured paw was also expressed as a % of the flow to the control paw. After injection of the microspheres the rats were killed and both paws removed and placed in vials to permit differential γ-counting of the ^{85}Sr, ^{51}Cr and ^{125}I content of the paws using a Packard autogamma scintillation spectrometer.

Table 1 shows the results from a typical group of experiments in which the inflammatory

Table 1 Local vascular changes caused by immersion of rat hindpaws in water at 60° C for 30 s, $n = 5$

	Oedema	*Blood flow*		*Blood volume*		*Albumin accumulation*	
	Injured paw weight % of control paw	*% cardiac output*	*% of flow in control paw*	*ml*	*% of content in control paw*	*ml*	*% of content in control paw*
Control paw	100	0.29± 0.06	100	0.05± 0.01	100	0.06± 0.01	100
Injured paw	132.2± 4.1	3.71± 0.56	1279	0.13± 0.01	260	0.74± 0.11	1233

stimulus was immersion of the paw in water at 60° C for 30 seconds. The changes measured 15 min after the burn indicate a large increase in blood flow to the injured paw with marked accumulation of albumin in the tissue and a small increase in blood content.

The use of a mass spectrometer for the analysis and measurement of trace concentrations of anaesthetic vapours

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The possibility of untoward effects resulting from the long term exposure to low concentrations of certain anaesthetic vapours has recently caused concern amongst some anaesthetists. Various methods have been devised to minimize the concentration of these vapours in the operating theatre and in order to judge their effectiveness it has been necessary to devise a method of accurately measuring the concentration of the vapour remaining in the operating room. Since other vapours may be present in relatively high concentrations it is important to ensure the method used is specific for the particular vapour being studied. It is also important to have a method of providing standard concentrations of the gas in the parts per million range.

An ideal instrument for such an investigation is a mass spectrometer since it is capable of measuring very low concentrations and can be specific for any particular vapour under investigation. The instruments that will be demonstrated are quadrupole mass spectrometers capable of measuring ions of up to 200 at. mass units in concentrations as low as one part per million.

A method of producing calibration vapours in the parts per million range by continuous serial dilution has been developed. The problems associated with stabilizing high flow rates through rotameters were overcome by using a fluidic device which ensured a high stability of flow rate into the dilution circuit.

The technique is at present being used to study the rate of loss of vapours from anaesthetic tubing both during use and during periods when, though not in use, vapours absorbed by the tubing may pollute the surrounding atmosphere.