during the acute stages of the infection, bringing about impedance of blood flow. Other actions of histamine are being further investigated.

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A model to demonstrate the inhibition by dexamethasone of anaphylactic bronchoconstriction

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The efficacy of steroids in the treatment of human bronchial asthma is well known. Their selection for anti-asthmatic use is based on their anti-inflammatory and anti-rheumatic potency, as no satisfactory laboratory test for assessing their effects against allergic bronchoconstriction has been demonstrated. We describe the effect of dexamethasone against anaphylactic bronchoconstriction in the rat.

Wistar rats were infected by subcutaneous injection of 3,000–5,000 larvae of *Nippostrongylus brasiliensis*. Five weeks later, animals were lightly anaesthetized with ether and the brain and spinal cord destroyed by pithing. The trachea was cannulated and the rat ventilated with a Starling miniature respiratory pump of stroke volume 5–7 ml. at a rate of 90 strokes/min. The side arm of the tracheal cannula was connected to a non-return water valve set at a pressure of 7·5 cm water. For intravenous administration of substances the jugular vein was cannulated. Tracheal flow was measured with a pneumotachograph and recorded on a multi-channel electronic recorder. Animals were challenged with *N. brasiliensis* antigen (500 worm equivalents/kg intravenously) (Ogilvie, 1967). The resultant decrease in tracheal flow was used as an assessment of bronchoconstriction and was recorded for 10 min after challenge.

In an experiment using thirty-nine animals, dexamethasone (5 mg/kg) was given intraperitoneally at 1, 4, 24 and 48 hr before challenge to groups of nine to eleven rats. Twelve rats were untreated. The resultant time/response curve showed that the activity of dexamethasone increased with time to a maximum at 24 hr, then waned. The maximum reduction was significantly ($P<0·025$) different from control. In a further experiment using ninety-four animals, one dose of dexamethasone was given intraperitoneally 24 hr before challenge to each of six groups of twelve to thirteen rats using a dose range of 0·0156 to 16 mg/kg using four-fold dose increments. One further group of nineteen animals received only saline. Dexamethasone reduced the anaphylactic bronchoconstriction in a linear ($P<0·001$) dose related manner. Significant ($P<0·05$) reductions were obtained over the dose range 0·25 to 16 mg/kg.

Guinea-pig anaphylaxis may serve as a model of human bronchial asthma (Collier & James, 1967), but steroids have not been conclusively demonstrated to reduce anaphylactic bronchoconstriction in this species (Hicks, 1969). The above

results indicate that the bronchial tree of the rat and of the human asthmatic respond comparably to a corticosteroid.

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Pulmonary mechanical changes in experimental bronchitis

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SO_2-induced pulmonary mechanical changes have been studied in the dog (Lulling, Lievens, El Sayed & Prignot, 1968). These studies have shown that the bronchitic dog responds to treatment with bronchodilator drugs such as isoprenaline, theophylline and decloxizine.

Since the rat is a more convenient species for laboratory study, it was decided to study the pulmonary mechanical properties of rats which had been exposed to SO_2. Male caesarean-derived rats were exposed 6 hr daily, 5 days a week for 20 weeks to an atmosphere containing SO_2 (200 p.p.m.). At the end of this period pulmonary mechanical properties were measured and histological damage assessed.

The rats were anaesthetized and the trachea cannulated. Recordings were made of respiratory flow rate and transpulmonary pressure. Integration of the flow signal provided volume information. Pulmonary compliance and resistance were calculated from the flow, pressure and volume traces (Amdur & Mead, 1958) and corrected for body weight.

The lungs were removed and fixed in buffered formalin. After staining with Mayers haemalum and eosin, periodic acid-Schiff and alcian blue the sections were assessed for histological damage (Lightowler & Williams, 1969). The pulmonary resistance of the animals exposed to SO_2 was significantly greater than that of the air control animals (from "t" test $P=0{\cdot}002$). Pulmonary compliance of the rats which had been exposed to SO_2 was significantly lower than that of the air control rats (from "t" test $P=<0{\cdot}05$). Pulmonary damage due to SO_2 was reflected in the total histological score. The SO_2 group had significantly higher histological scores than the air control group (from "t" test $P=<0{\cdot}01$).

It is suggested that this experimental system may be of value in the assessment of drugs intended for use in chronic bronchitis.

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