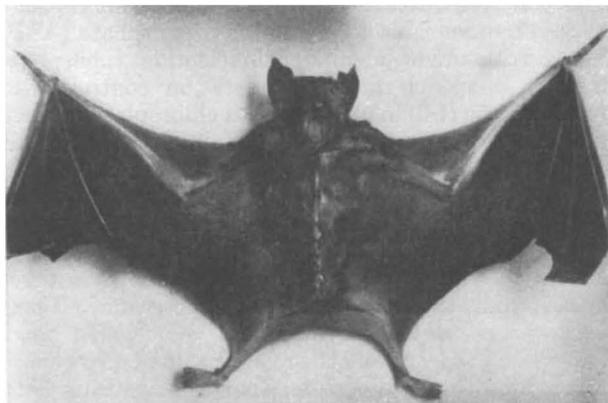


other activators of plasminogen now in use—urokinase and streptokinase. But purification of desmokinase is still in progress and there will be a long time to wait before clinical trials can begin on a potential new treatment for sufferers from thrombosis.



Vampire bat.

Schoolboys and students, too, can expect to benefit from the fruits of the labours in the Nuffield Institute, for Dr G. H. du Boulay is preparing an atlas of radiograms of the cerebral arteries of mammals. So far he has injected the arteries of dead specimens of more than a hundred species and made radiograms from them. Early volumes are in the press, and when the atlas is complete its author hopes that it will become a revered guide for dissection, updating the classic work of nineteenth century anatomists.

Activity in the Wellcome Institute of Comparative Physiology centres on reproduction in various exotic animals which have not previously been familiar inhabitants of laboratories. Dr B. J. Weir has a collection of hystricomorph rodents from South America, including the tuco-tuco (*Ctenomys talarum*) which unexpectedly developed diabetes in captivity. The degu (*Octodon degus*) bred so successfully that its numbers increased seven-fold in its first year of captivity. The chinchilla (*Chinchilla langeri*), however, is far less fertile, which leads to problems for commercial breeders. The reproductive difficulties of chinchillas arise because they have long heat cycles within a restricted breeding cycle, and also have a long pregnancy, so that opportunities for conception are limited. Pregnant mare's serum and human chorionic gonadotrophin have been injected to induce fertility, with the consequence that successful mating was followed by normal pregnancy and the birth of normal numbers of young.

The next step is to inseminate semen artificially from chosen males to propagate desired characteristics of fur quality and reproductive capacity. Advice will doubtless be on hand from Dr R. C. Jones, who is studying the problems of preserving mammalian semen for artificial insemination. Although many millions of cows have been inseminated with deep frozen sperm, the semen of some species deteriorates unless it is used when fresh. Dr Jones is looking at the injurious effects of freezing on sperm of various animals, including zebra, chimpanzee and boar, a species which presents particular problems of sperm preservation. Artificial insemination may well provide the means of preserving species in danger of extinction.

## POLLUTION

# Take a Deep Breath

from a Correspondent

CONCERN for the effects of atmospheric pollutants on the lung was reflected in the theme of the annual Hanford Biology Symposium, held from June 2 to 5 at Richland, Washington. A notable feature of the meeting was the increasing interest in attempts to define effects of pollutants not only in terms of pulmonary structural and functional changes affecting gas exchange, but also in terms of the underlying biochemistry. The cells in the lung have always seemed to biochemists much less active and interesting than cells of the liver, kidney, heart, brain and other organs, but now lung biochemistry has emerged as a discipline in its own right. Several contributions were devoted to analyses of metabolic pathways in lung cells, which have certain peculiarities.

Much attention was given to lipid synthesis in the lung in an attempt to understand the formation and turnover of the surfactant which, by reducing surface tension at the liquid-air interface, helps to maintain open airways. One of the pioneers of this work, Dr J. A. Clements (University of California, San Francisco), reported that in the lungs of eleven vertebrates, varying from reptiles to man, the abundance of surfactant and its principal component, dipalmitoylphosphatidylcholine, is related to the area of the respiratory surface, whereas the quantities of other lipids reflect pulmonary mass and diet. How many surfactant components exist is still unknown, nor has its composition provided clues to differences in susceptibility to adverse environments—although surfactants represent an obvious possible target. Several investigators, notably Dr J. Gil (University of Berne, Switzerland), have developed methods for preserving a layer of material over the alveolar epithelium in electron micrographs, and most experts agreed that this probably corresponds to surfactant. Dr O. K. Reiss (University of Colorado) and his colleagues have shown that a specific thiolacetate esterase is liberated from the lamellar bodies of the type 2 epithelial cells and is apparently related to surfactant.

Several contributors dealt with the origin and biochemistry of alveolar macrophages. Dr M. A. Brunstetter and her colleagues (University of California, Davis) used chimaeric mice with esterase (*Es-2*) markers to show that most alveolar macrophages originate from bone marrow. Several pollutants have been found to affect the capacity of alveolar macrophages to kill organisms, this being the principal mechanism by which the lung resists bacterial infections. Some of the most striking effects on macrophages are produced by particulate pollutants, such as silica and asbestos, as described by Dr A. C. Allison (Clinical Research Centre, London).

Of the gaseous pollutants, most work has so far been carried out with oxidizing atmospheres, such as high oxygen, ozone or nitrogen dioxide. These oxidize lipids and produce marked changes in lung structure and function. The structural changes following exposure to pure oxygen at one atmosphere, described by Dr E. R. Weibel (University of Berne, Switzerland), included degeneration of endothelial and type I alveolar epithelial cells and replacement of the latter by type II epithelial cells.