localizes in a small area. Equally obscurely, this usually occurs in the mucosa of the ethmoidal region, and then, it is thought by gravity and the suction effect of inspiration, these oedematous areas are drawn downward into the nasal cavity as polyoidal excrecences, pedunculated or sessile. Occasionally, the process occurs inside the maxillary sinus, and the oedematous mass may make its way out through the ostium into the nasal cavity and ultimately through the posterior choana into the nasopharynx, a type known as an antrochoanal polypus. Nasal polyposis may be associated with pyogenic infection, but in view of the relative frequency of both conditions the combination is unusual. It is unfortunately rarely possible to identify a specific allergen for either form of allergic reaction, and in a known case with an allergic diathesis it is impossible to forecast which, if either, type of reaction will occur.

The dominant symptom of nasal polyposis is increasing nasal obstruction, often bilateral. The patients suffering from nasal polypi rarely also suffer from sneezing attacks and rhinorhoea, in spite of their commonly believed similar allergic aetiology.

Treatment with antihistamines would seem reasonable, but is unfortunately of little value in established cases. It is doubtful whether steroid therapy is generally justifiable, but it has been tried. From time to time beneficial results are reported. However, none of the suggested procedures has received much support. Effectively, removal of the obstructing masses is still the method of choice, though techniques vary.

In many cases there is only one pedunculated polypus hanging from an ethmoidal cell. Careful removal of this under a local anaesthetic using a snare is a relatively simple procedure and may never be followed by recurrence. When several pedunculated polypi are present, the same technique can be used. With a clean cutting pull-through snare the trauma is minimal. Some surgeons prefer an avulsing snare, but this implies an uncontrolled tearing technique which seems unnecessary in these cases. Antrochoanal polypi can also be removed by snare or forceps (though a general anaesthetic is sometimes needed) and frequently never recur.

When polypi do recur, and especially when they are numerous and sessile, more radical measures must be used. An intranasal ethmoidectomy, attempting to remove all the mucosa at risk, is an excellent operation. It is not an easy one, especially if septal or other anatomical abnormalities are present, but a careful and painstaking technique taking plenty of time in visualizing and identifying structures will yield gratifying results.

External approaches to the ethmoidal region have been described and advocated. If the frontal sinus is involved, an external approach is essential. Good access to the area of disease is obtained through the classical incision in the inner canthus region or the Patterson incision below the eye. Those who advise and use an external approach are satisfied that they get a better result than with an intranasal technique, but a carefully performed operation by either method should secure a good result. Unfortunately, it is virtually impossible to remove every square centimetre of ethmoidal mucosa by any surgical operation and guarantee complete freedom from a recurrent polypus. In some cases polypi re-form almost like malignant tumours, but happily such cases are rare. The disease is not malignant and not in itself mortal, but it causes a good deal of misery. In any case of continuing and increasing nasal obstruction, nasal polyposis is a likely diagnosis, and in the early stages it can readily be treated.


Monkeys for Research

In recent years the number of monkeys used for biomedical purposes has greatly increased, mainly in the production and testing of vaccines. Most monkeys used in laboratories are captured from their natural habitats. It has been estimated, for example, that the number imported into the United States during 1966 was greater than 100,000 and into the United Kingdom during 1968 over 11,000.

Many of the imported monkeys are in poor condition. They are frequently infected with pathogenic microorganisms, some of them transmissible to man, occasionally with fatal consequences. It is essential, therefore, to quarantine and condition the animals after they arrive at their destination and before they are used for experimental work or the production of vaccine. During a conditioning period of 12 weeks it is not unusual to lose at least 20% of each intake mainly from bacterial, viral, and parasitic infections and probably "stress" resulting from capture and transportation. The principal bacterial infections are those caused by salmonellae, shigellae and Mycobacterium tuberculosis, but the most serious microbial hazards to personnel are those created by viruses. Among these are rabies, Herpesvirus simiae ("B" virus), and the Marburg agent of verrat monkeys. To prevent the spread of rabies to Britain the importation of all mammals is now strictly controlled, and animals from abroad may be held only in quarantine premises authorized by the Minister of Agriculture, Fisheries, and Food.

Though the recommended precautions designed to reduce the risks associated with the handling of wild-caught monkeys or their tissues no doubt confer a high degree of safety, these risks could be further reduced by using animals bred from healthy stock under controlled conditions, just as other laboratory animals and farm animals are produced. Furthermore, the use of healthy laboratory-bred animals would reduce the numbers required for scientific purposes simply by decreasing the wastage of tissues and the frustration of experiments owing to infective agents.

Research in developmental biology, including fetal development and infant growth, will continue to be an important field of study, and many species of animals, including monkeys, will be needed for the study of problems that for ethical reasons cannot be undertaken in man. The demand by research workers for pregnant and newborn monkeys has lately increased, and initially attempts were made to satisfy it by importing wild-caught pregnant animals. But it was soon found that this method of obtaining them caused high wastage from abortion and stillbirths. Breeding under controlled conditions largely overcomes these problems. Moreover, when accurately timed pregnancies are required it is essential to have access to colony-bred animals with a known reproductive history.

An important aspect of using animals for experiments which the research worker must not ignore, and which is
likewise of concern to the community benefiting from the research, is the conservation of the wild animals. The ubiquitous rhesus monkey (Macaca mulatta) is showing signs of depletion in parts of Asia, and the golden tamarin (Leonticeus rosalia) in Brazil is said to be near extinction. In addition to the depletion of wild animals by their capture for research purposes must now be added the ever increasing deforestation resulting from agricultural development in tropical countries. J. R. Napier has indeed suggested that before the end of this century there will be few natural populations of non-human primates living undisturbed lives. Simply to conserve the species, therefore, and to ensure supplies for future biomedical research there is a need for setting up breeding colonies. Nor can humanitarian considerations be ignored. Scientists and medical men, whatever their specific field of interest, must have good reason to justify the transfer of wild animals to the restricted conditions of laboratories from the free life they previously enjoyed.

What may cause concern is the greater cost of breeding animals in captivity than catching them in the wild. A conditioned wild-captured rhesus monkey now costing £40 would cost not less than five times that amount if bred in captivity, thus bringing the cost of these animals up to that of some species of farm animals—cattle, for example—which are used in veterinary research. Smaller monkeys, such as marmosets, would cost much less, but even these are likely to cost more than £40 if bred under laboratory conditions. The feasibility of breeding monkeys is well established, and the economic aspects have been summarized by W. I. B. Beveridge. He stated, “Now that this background of scientific knowledge is available, commercial breeding is a matter of technology and economics, in other words animal farming.” ... “Basically, monkeys are not so very different from other animals.”

Research workers have a duty now to look to the future and plan the controlled breeding of the species they are likely to need. For the present only wild-captured monkeys in plentiful supply should be used, and then only when no other laboratory-bred animal would be suitable.

6 Bouger, L. R., Lancet, 1966, i, 941.
11 Perkins, F. T., and O’Donoghue, P. N., Laboratory Animal Handbooks, No. 4, London, Laboratory Animals Ltd.

Undergraduate Teaching in Anaesthetics

The role of anaesthetics in the undergraduate curriculum was discussed at a recent seminar organized by the Faculty of Anaesthetists of Great Britain. Heads of anaesthetic departaments and deans of undergraduate medical schools were invited to it, as well as representatives of the General Medical Council and the Association of Anaesthetists and undergraduates. It was apparent that the teaching of undergraduates by anaesthetists is not uniform throughout the country. In some centres there is no contact between them; in others the contribution by anaesthetists to teaching is considerable. The extent to which anaesthetists teach tends to be greater where there is an established university department. London University appears to be behind provincial universities in this respect. Though the teaching of anaesthesia was not specifically mentioned either in the G.M.C.’s recommendations on basic medical education or in the report of the Royal Commission on Medical Education, there was general agreement at the seminar that it is in the interest of the aspiring doctor.

Anaesthetists can make useful contributions to instruction in physiology and pharmacology and to the education of undergraduates in such subjects as the care of the unconscious patient and the maintenance of blood volume. And, with members of other disciplines, they can contribute in topical teaching on such subjects as the management of poisoning and chronic pain. Moreover, a period of instruction in anaesthesia is popular with most undergraduates because it allows them to carry out practical procedures on patients. Students can also see what a career in anaesthetics has to offer.

Opinions varied on where anaesthetic teaching should lie in the undergraduate timetable. There was a general view that teaching of anaesthetics in the clinical period could be profitably combined with surgical appointments. The student then has the opportunity of finding a role in the preoperative, operative, and postoperative care of patients. The opportunity for students in either their fourth or fifth year to take an elective period of six weeks to three months in anaesthesia away from their own centre, in this country or abroad, might be encouraged if it is financially possible. But whether anaesthesia and related topics should be included in the final qualifying examinations is still open to debate.

Not Quite £1 plus 4%

N.H.S. doctors needed no crystal ball to forecast the outcome of their 1973 pay review (Supplement, p. 5). As might have been expected, the Review Body was not so independent as to ignore the Government’s incomes policy in making its recommendations, so the scope for innovation or surprise was limited. The profession will, however, be disappointed that Lord Halsbury and his colleagues failed to take full advantage of the Government’s “group formula” for redistributing incomes to the less well off. Money due to doctors earning more than £4,590 a year under the £1 + 4% formula could not be paid because the increase would have exceeded the individual £250 pay code limit, but within the terms of the Government’s formula this could have been passed on to lower paid doctors. The profession had agreed to doctors being treated as one group on this occasion (a summary of the profession’s evidence appears in the Supplement p. 9), and it was theoretically possible for junior house officers to have received 14% and still be within the law. In the event they will only get 9-4%, with registrars receiving 8-2% and top-of-the-scale senior registrars 6%.