

ments in the trap, the design of which has been in use since 1963.

A considerable amount of data on physical factors which may affect salmon migration has been accumulated by the Lancashire River Authority, other fishery boards and university groups. It has been shown, for example, that more fish move upstream during the dark than in the daylight, and they also tend to move more when the air temperature is lower than the water temperature. Mr Stewart's department has also been getting interesting information on the mean water level in rivers necessary for migratory fish which apparently need deeper water than non-migratory fish. They have found, for example, that in the upper reaches of the Lune 26 miles from its mouth, and in the Leven only 400 yards from tidal waters, salmon require a very similar mean water level. In other words, the fish appear to need the same water level in estuaries and at the head waters of a river. It is obviously important to know the minimum water level tolerated by migratory fish, for then it can be judged how much water can be extracted from salmon rivers for urban and industrial purposes. The fishing value of the Lune is well over £1 million, so that more than just the pleasure of the local angler is at stake. The computer analysis is also expected to help in other directions. It may show, for example, how the number of fish in British rivers is being affected by netting salmon off Greenland.

## Fertile London Zoo

In 1967, for the third year running, attendances at the London Zoo exceeded two million. The council of the Zoological Society of London in its annual report attributes the high attendance to the attraction of the new buildings, to the general improvement of the exhibition and facilities for visitors and to an extensive advertising campaign and wide press publicity. At Whipsnade, the attendance of 588,825 was less than



Two of the cheetah cubs born at Whipsnade in September.

in 1966, but the wet weather in May was probably partly responsible for the decrease.

Rebuilding at Regent's Park and improvements at Whipsnade continue to make heavy demands on the society's financial resources. Capital expenditure during the year was £233,000. The accounts for the year show a small deficit, but the council has decided not to increase the entrance charges for 1968. The

Charles Clore Pavilion for mammals, opened last year, is said to have been a great success, but its popularity with visitors has brought some unforeseen difficulties, in particular the problems of noise and crowd control in the nocturnal section. Other works in progress are reported—the new combined sea-lion viewing stand and canine quarters building postponed from 1966 should be finished this summer.

The society is concerned to co-operate with other zoos in breeding projects. Its efforts on behalf of Chi-Chi, the giant panda, are well known. During 1967 its male snow leopard was sent to Amsterdam Zoo where there is a single female of this comparatively rare species. The chief breeding success of the year at Whipsnade was the birth in September of three cheetahs. The cubs, one male and two females, were left in their enclosure with their mother who has reared them entirely herself. This is the first time in Britain that cheetahs have been bred successfully and it is probably only the second time that cheetah cubs born in captivity have been reared by their mother.

Details are given of the society's scientific activities and research projects. The staff of the Nuffield Institute of Comparative Medicine now numbers 47. During the year the institute was designated by the World Health Organization as a collaborating centre for comparative pathology of non-domesticated vertebrates. Research at the institute included studies on viral and filarial disease in New World monkeys, trypanosomiasis, and nutrition in primates. Projects at the Wellcome Institute of Comparative Physiology included work on the reproductive cycle of the Skomer vole, problems of infertility in captive animals and reproduction in the chinchilla. The society's educational programme for schools seems also to have been a success—the number of pupils attending lecture-demonstrations increased by about 18 per cent over the figure for 1966. Membership of the Young Zoologists Club has also increased.

## Disease caused by Transfusion

A RECENT study undertaken by Allan G. Redeker and Carl E. Hopkins of the University of Southern California School of Medicine and the Los Angeles County Hospital has shown that whole pooled serum often transmits the virus causing hepatitis. Out of 120 patients studied over a period of three years, twelve contracted acute hepatitis within six months of receiving whole pooled serum, but not a single case occurred among patients receiving a control solution of five per cent serum albumin. The severity of this finding is further emphasized by the fact that the pooled serum in each case had been subjected to the method of sterilization normally used in the United States—storage for six months at room temperature followed by treatment with ultraviolet irradiation.

Pooling—the mixing of large quantities of plasma from the blood of many individuals—is used on a large scale in the United States, and it has been estimated that more than 300,000 units are administered annually. Serum is used primarily for severe burns and for transfusing to patients while they are waiting for their blood to be cross-matched. It was used extensively during the Second World War to revive and sustain the badly wounded. In view of

this new evidence, which is reported in the March-April edition of *Transfusion*, a committee of the National Research Council, Washington, DC, has recommended that the use of whole pooled serum "be discouraged or even discontinued".

That the Americans use pooled serum at all is highly surprising because as far back as 1954 Murray *et al.* (*J. Amer. Med. Assoc.*, **154**, 1072) showed that storage at room temperature did not prevent the occurrence of hepatitis in three out of five volunteers. The danger of using pooled serum was further emphasized in 1955 when Murray (*Bull. NY Acad. Med.*, **31**, 341) showed that injection of as little as  $10^{-6}$  ml. of known infected plasma was capable of inducing an attack of hepatitis. Obviously the more donors the plasma is derived from, the greater the chance that one of them has hepatitis or is a carrier.

According to Dr W. D. A. Maycock of the Blood Products Laboratory, the American method has never been adopted in Britain because of the recognized disadvantages. Instead, small pooled sera obtained from the blood of not more than ten donors are used. The results of a survey in 1954 showed that hepatitis following transfusion occurred in one or two individuals per thousand and the method is therefore fairly safe.

The virus can be killed by exposure to ultraviolet light, but unfortunately in practice it is difficult to sterilize the plasma without damaging the plasma proteins and the method is therefore of doubtful use. A survey carried out by the Medical Research Council in 1954 showed that four per cent of patients transfused with irradiated plasma contracted hepatitis. Hartman *et al.* have shown (*Amer. J. Clin. Path.*, **24**, 339) that  $\beta$ -propiolactone can be used to enhance the effect of irradiation, but the conditions of treatment seem fairly critical.

Hepatitis can also be transmitted by using imperfectly sterilized syringes or needles. This is especially evident among drug addicts who use communal needles, as shown by H. B. Dull in 1961 (*J. Amer. Med. Assoc.*, **176**, 413).

## Oxygen

A HYPERBARIC oxygen bed has now been in use at the Westminster Hospital for 18 months for the treatment of acute myocardial infarction. There was some quiet crowing at Vickers last week when the impressive results with a small series of patients were announced. Thirty-seven of the forty serious cases of acute myocardial infarction survived. Post-mortem examination showed that two of the three deaths were caused by thrombosis of both main coronary vessels, which precluded survival. The cases were further analysed to show that of twelve patients with cardiogenic shock, ten survived. Pulmonary oedema was reversed in all of fourteen cases and, in thirty-six patients, atrial or ventricular arrhythmias or conduction defects were reverted to normal, except for one case of complete heart block.

At present, the mortality rate among people admitted to hospital with acute myocardial infarction is 30 per cent. The doctors at Westminster suggest that, as well as a 10 per cent reduction in this figure with intensive-care units, a further 10 per cent reduction can be achieved if hyperbaric oxygen therapy is used. High pressure oxygen treatment has been used by

other doctors with less dramatic results. Dr A. J. V. Cameron and his group in Glasgow have treated patients in pressurized rooms, with pressurized oxygen given by mask. This method has had little success and there is scepticism as to just what future there is for hyperbaric oxygen treatment in heart disease. A full series of clinical trials will be necessary if the effectiveness of the Vickers bed is to be demonstrated convincingly, and proposals have been submitted to the Ministry of Health.

The Vickers bed is an individual chamber looking rather like the cockpit of a racing car. Patients can sit or lie inside while oxygen is supplied to them at pressures of up to two atmospheres. The advantage is that in such individual compartments the patient is completely surrounded by oxygen and a mask is not required. At the hospital, patients are in the bed for up to two hours at a stretch, during which time the two most obvious symptoms of heart trouble, pains in the chest and difficulty in breathing, are relieved. Treatment of this kind is essentially of a first aid nature, providing oxygen to the tissues to maintain them in good condition until normal respiration is restored. After a heart attack the body tends to recover by itself, so the effects due to the hyperbaric oxygen treatment alone are hard to assess. Clinical trials with controls would be helpful, but in this case it would be hard to deny the treatment to a specific number of patients if, with the treatment, they would have a good chance of survival.

## Fish take to the Air

AN air-lift of about 150,000 live fish from Lake Tanganyika to Lake Kariba, 700 miles away, has recently taken place. The project was organized for the Food and Agriculture Organization as part of a United Nations Special Fund project for boosting fisheries in the Kariba area. Lake Kariba is naturally stocked with fish, but it was decided that stocking it with outside species might improve its fishery potential.

A clupeid fish native to Lake Tanganyika, *Limnothrissa miodon*, was chosen. It is a plankton-eating species, is very prolific and sells well in Tanganyika.

The operation of transporting the fish fry in water-filled containers began in July 1967. The organizer, Hubert Matthes, estimates that 60 per cent of the fry survived. A further 100,000 fry have been transferred by the Zambian Game and Fisheries Department. Sightings of schools of the small silvery fish have been reported by local fishermen, but Matthes has said that it is too early yet to tell whether the introduction to Lake Kariba was successful.

## Back from Aldabra

THE third phase of the Royal Society expedition to Aldabra is now complete, and those concerned have left the island. Their spell of duty, since last December, spanned the wet season. Their work will be continued by a fourth party of scientists which has just sailed from Mombasa.

The returning party has nothing spectacular to report. The study of insects, birds and giant tortoises has been continued. One innovation has been the investigation of fresh water pools by Dr K. G. McKenzie, leader of the expedition since he joined it in January.