nuptial migratory movement". That moult adaptation in relation to long-distance migration need not be a general phenomenon, and probably has only taken place in certain families of birds, is indicated by the following observations on two species of long-distance passerine migrants. In April 1953 a large number of swallows, chiefly consisting of the European swallow, *Hirundo rustica*, and the European house martin, *Delichon urbica*, perished in the neighbourhood of Cape Town, due to a short spell of adverse weather conditions. Of the thirty-five *H. rustica* examined, 99·1 per cent showed moulting flight-feathers, 65·7 per cent had moulting tail-feathers and 8·6 per cent had moulting body- and head-feathers. Of fifty-two *D. urbica*, 40·4 per cent had moulting wing-feathers, 75 per cent moulting tail-feathers and 94·2 per cent moulting body- and head-feathers[2].

It is in April that these swallows leave southern Africa on their long-distance flight to the northern breeding quarters. Moulting flight- and tail-feathers at this time must be a disadvantage to these birds. The above data show that the moult which these swallows undergo in their wintering quarter sets in late and is continuous with no hiatus between the moulting of body- and head-feathers and the wing- and tail-feathers. Swallows are also very much dependent on their wings just as petrels are. Still, moult adaptation in relation to long-distance migration seems to have taken place in one but not in the other.

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[1] Marshall, A. J., and Serventy, D. L., *Nature*, **177**, 4516 (1956).
[2] Broekhuysen, G. J., *The Ostrich*, **24**, 3 (1953).

Injury from the Decompression Component of an Air-Blast Wave

PREVIOUS experiments have shown that about 80 per cent mortality is to be expected when 60-day old mice are explosively decompressed, in a matter of 30 m.sec., from a pressure of 80 lb. per sq. in. above atmospheric. Since the positive phase of an air blast wave is characterized by a shock front followed by a rapid drop in pressure comparable to explosive decompression, it was thought of interest to investigate the lethal effect of this component of the blast wave. Accordingly, mice were subjected to 80 lb. per sq. in. over-pressure for varying durations of time and then explosively decompressed. No lethal effect was observed until the mice had been under pressure for times longer than 100 m.sec. At 1 second the mortality had only risen to about 12 per cent, as compared with the control data on 80 per cent mortality which was obtained when the mice were under pressure for a matter of 1 min. It is therefore concluded that the explosive decompression component of the blast wave has no lethal effect *per se*. Details of this work will be reported later.

The opinions or assertions in this letter are the private ones of the writers, and are not to be construed as official or reflecting the views of the Navy Department.

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Spike Potentials produced by the Sea Lamprey (*Petromyzon marinus*) in the Water surrounding the Head Region

UNDER the auspices of the Fisheries Research Board of Canada an investigation was started recently in this laboratory on hearing in the sea lamprey. During preliminary observations, adult *Petromyzon marinus* were placed in rigid 'Lucite' cylinders of 1½ in. inner diameter. A row of silver electrodes had been placed in the wall of the tube at 1-in. intervals along a straight longitudinal line. Each of the electrodes could be connected individually with a d.c.-fed pre-amplifier. The last electrode in the row, located beyond the tail of the animal, served as reference electrode. The tube, filled with fresh water and containing the animal, was kept in a Faraday cage together with the pre-amplifier. The output of the amplifier was connected with a cathode ray oscilloscope. In the water surrounding the head region spike potentials were recorded from electrodes 15–20 mm. away from the animal's surface. Fig. 1 represents a recording from an electrode located immediately above the left eye of the animal. The triphasic spike has a duration of about 20 m.sec. and a potential of 200 μV.; the positive third phase has a potential of 30 μV. and lasts about 15 m.sec. Successive recordings from electrodes headwards or tailwards demonstrated that the highest potentials in the water were towards the anterior extremity of the animal, that is, surrounding the region of the head anterior to the eyes. The values of the potentials decreased rapidly posteriorly to the eyes and no spikes could be recorded from electrodes beyond a distance of 2–3 in. from the eyes towards the tail of the animal. The electrical field was therefore confined to the anterior end of the body.

By recording with continuously moving film and using single sweeps, the frequency of the spike potentials was determined. Fig. 2 represents a short section of such a film. The time scale is 0·1 sec. The spikes on this film recur with a frequency of 0·4 sec., but under different experimental conditions this frequency changed. It was established that the recurrence of the spikes is synchronous with the externally visible respiratory movements of the gill

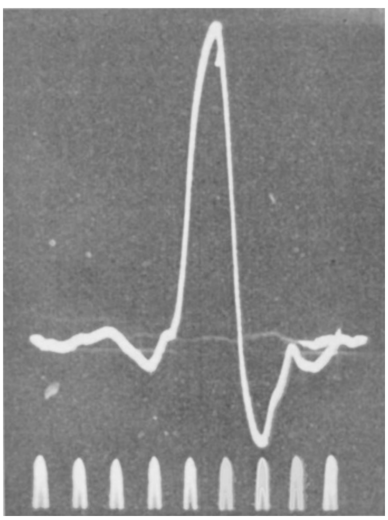

Fig. 1. Spike potential in the water; electrode 20 mm. away from the fish above the left eye. Time signal, 10 m.sec.; 200 V.

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