THE point raised by Prof. Polanyi appears to be based on a difference of opinion between him and the financial backers of inventors. He is of opinion that the proposed reform "would not on the whole take away any of the financial stimulus for the exploitation of patents while leaving everyone free to use them". On the other hand, however, the opinion of the financial backers, insofar as it has been indicated during recent discussions of suggestions for the compulsory licensing of all patents, is that the monopoly or *exclusive* licence obtained through the grant of a patent is generally necessary before the financial arrangements for commercial exploitation of an invention become practicable. The small number of patents that are voluntarily endorsed 'licences of right' under the existing arrangements shows that the opinion of inventors is, as a rule, in agreement with that of their financial backers.

THE WRITER OF THE ARTICLE.

Strength of Glass and Duration of Stressing

IN the columns of *Nature* recently and in other places there have appeared various discussions of the relation between the strength of glass and the duration of the stressing, frequently centring on the experimental results of Mr. T. C. Baker reported in my paper on the "Mechanical Properties of Glass"[1] in the form of a graph. There, breaking stress is plotted as ordinate against the logarithm of the time as abscissa. This is the way the scanty earlier results were plotted by other investigators.

To save the time of those who have been trying to fit equations to this curve, I may point out that if *reciprocal* of stress is plotted against logarithm of time a perfect straight line is obtained, for the glass specimen, the equation of which is

$$f \times \log_{10}(t/6) = 65{,}000,$$

where f is breaking stress in lb./in.^{2} and t is duration of steady load in microseconds.

If this curve can be extrapolated substantially the implications would be (*a*) at the long time end, the stress that can be supported for an infinitely long time is zero; (*b*) at the short time end, no finite stress can break these specimens if the duration is less than 6 microseconds.

The curve for porcelain rods shown in the same paper also reduces to a perfect straight line so far as the first five experimental points are concerned. The sixth point falls off the line, but the point was obtained by different apparatus in difficult circumstances and may perhaps be distinctly in error.

The physical meaning of implication (*b*), that glass and porcelain rods can stand an infinite load for a finite (but very short) time, is not at present clear. Perhaps the curve cannot be extrapolated too far that way, or perhaps the finite velocity of sound, or of crack propagation, comes in.

The outbreak of the War in the midst of Mr. Baker's researches, and other handicaps, have prevented any full account to the scientific Press of his work: the brief report in 1942 in my own paper above cited has caused much speculation, and Mr. Baker and I hope it may be possible to remedy the omission in the foreseeable future.

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[1] *J. Appl. Phys.*, **13**, 623 (1942).

Avoidance of Obstacles by Bats

I HAVE read with great interest Mr. Pike's article on bats[1] and Squadron Leader A. K. McIntyre's letter[2] commenting on it. As the latter correctly states, it was Galambos and Griffin who were largely instrumental in proving that bats employ a supersonic form of acoustic 'radiolocation' when flying at night. They were not, however, the originators of this hypothesis, as they themselves state in their papers. This hypothesis was advanced by me as the result of a number of experiments performed in a set of rooms in King's College, Cambridge, the windows of which looked out on to the Cam. During the summer months, bats flew into these rooms in large numbers in the late evening and would remain there until dawn, flying round and round at will. They were unwitting collaborators in my experiments and continued to visit me without fear until the end of the long vacation. As a result of these visits I wrote an article in which I advanced the hypothesis that bats detect and avoid obstacles by hearing reflexions of high-pitched vocal sounds emitted during flight.[3]

This hypothesis has been substantiated in the three interesting papers by Galambos and Griffin.

The main problems of the flight of the bat apparently being solved, there are a number of minor ones to which attention may usefully be directed. I hope to deal with these later.

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[1] *Nature*, **155**, 122 (1945).
[2] *Nature*, **155**, 672 (1945).
[3] *J. Physiol.*, **54**, 54 (1920).

Archæological Exploration in South Africa

ON page 676 of *Nature* of June 2, 1945, reference is made to the South African laws which control the investigation of archæological sites and the collection and exportation of vertebrate fossils.

Control of archæological sites will meet with wide approval because their number is necessarily limited, and the evidence they can give is largely destroyed by excavation. But vertebrate fossils are in an entirely different position. The very important fossil faunas of the Karroo occur irregularly distributed over an area of some 100,000 square miles, a very considerable proportion of which is free from vegetation. They are, of course, not restricted to the surface, so that new specimens are constantly exposed by denudation. The total number exposed at this moment is certainly enormous, and it is certain that no conceivable amount of collecting can exhaust the field or even keep up with the exposure of new specimens.

A comparable case is that of the White River Bad Lands of South Dakota, where an area of some 2,000 square miles has been exploited for some fifty years by from one to a dozen parties each year and still yields enough to satisfy each visitor.

In fact, while the archæological restrictions are imposed for the protection of the evidence, that on fossil vertebrates is for the protection of the South African palæontologists, who do not appear to wish their colleagues to examine the new materials.

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