A. Korn did much to increase the utility of selenium by simultaneously subjecting two cells of different sensitivity to the source of light, using them on opposite arms of a Wheatstone bridge arrangement. He found that for an increase of illumination δI, the current y obtained for a given voltage passed through the cell was $\alpha\delta I e^{-\beta t^{-1/m}}$, where β is an inertia constant, and m the 'exponential inertia'; m should be as much below 1 in value as possible and depends on the mode of preparation of the cell.

By selecting two cells such that

$$\frac{d(y_1 - y_2)}{dt} = 0$$

where y_1 and y_2 are respectively the small increments in conductivity for an illumination of time dt—which means that the product $\alpha\beta$ of each cell is practically the same—wonderfully sharpened action can be obtained which should be of the greatest value if it were applied to photometric work.

I have recently tried passing a single-phase alternating current through a Kipp and Zonen selenium cell, and, as I anticipated, the lag is automatically eliminated at each alternation of current, with the result that the cell responds with great celerity to changes in illumination and returns to zero—*i.e.*, its 'dark conductivity'—with great swiftness. The cell returns to the same zero time after time after quickly repeated illumination, very unlike its ordinary behaviour when the conductivity in the dark creeps up each time the illumination is cut off through cumulative ionisation. The periodicity of the current must of course be greater than that of the changes in light intensity.

It is quite easy to rectify the current that is passed through the cell so that an ordinary galvanometer can be used. The experiments indicate that by using alternating current an entirely new field of possibility is opened up for the selenium cell. Some years ago, when reproducing records of the voice on kinematograph film with selenium, I found that so many as 8000 vibrations per second could be dealt with distinctly, which indicates that our conception of the rate with which selenium can respond to changes in light intensity has been greatly handicapped. By the employment of alternating current, and so accelerating its rate of change, we may find that the selenium cell is of an extremely high order of sensitivity.

T. THORNE BAKER.

Research Department,
Imperial Dry Plate Co., Ltd.,
Cricklewood.

Magnetic Properties of Single Crystals of Iron.

IN a letter to NATURE, May 29, p. 753, Messrs. Honda, Kaya and Masuyama give a short account of some magnetic properties of single crystals of iron. In this laboratory I have investigated various magnetic phenomena in single crystals. In the *Proc. Roy. Soc.*, **107**, 496, 1925, an account of the variation of the susceptibility with the direction in the crystal has been given, and it may be mentioned that later a theoretical explanation of the effect has been given by Mahajani (*Camb. Phil. Soc.*, **23**, 136, 1926). In the *Proc. Roy. Soc.*, **109**, 570, 1925, experiments on the effect of crystal structure on magnetostriction have been described. This work is similar to that now described by Honda, Kaya and Masuyama, and their results are in very good agreement with those of the present writer. The rods used by them were much larger than those of our experiments, and their accuracy may be higher, particularly in the measurement of the magnetic intensity, but our results are more definite in that the rods used by us were orientated, within two or three degrees, parallel to a (100), (110), or (111) crystal axis. For example, we showed definitely that for the (111) direction there was only a contraction, a fact surmised by Honda, Kaya and Masuyama.

We hope to publish shortly some work already completed, on the change of resistance of iron-crystal rods in a longitudinal magnetic field. The results of this work have an important bearing on the phenomenon of magneto-striction, as they indicate that the increase in length for the (100) axis is quite different in origin from the decrease in the (111) direction.

W. L. WEBSTER.

Trinity College,
Cambridge.

The Taxation of Research.

WE have received notification that the Inland Revenue authorities are about to challenge the right of the Chemical Society as a charitable institution to recover the income tax deducted at the source from the interest on its invested capital. For eighty years the Society has published freely new knowledge in chemistry, and has carried a financial burden which could not have been borne had not Governments in the past provided rent-free accommodation and relieved the Society from taxation.

The great increase which has taken place, and is still taking place, in the amount of research work in chemistry emanating from our universities and university institutions renders it difficult, even under present conditions, for the Society to carry out the duties assigned to it by its charter, in view of the fact that within the past seven years its expenditure has increased by some 7000*l.* a year.

The margin between solvency and bankruptcy is small and may disappear if the Society is subjected to the taxation suggested.

H. B. BAKER, President.
JOCELYN THORPE, Treasurer.

Royal College of Science,
South Kensington,
London, S.W.7,
June 8.

The Coal Fire.

IT is the opinion of every one with whom I have spoken on the matter, that a coal fire possesses some subtle qualities which a gas or electric fire lacks. In her letter to NATURE, March 6, p. 343, Dr. Stopes instances the great curative powers of a glowing coal fire, and the renewed vitality she experienced after exposure to it during convalescence. My own experience with chickens has a direct bearing on the subject.

A number of chickens hatched during April, and housed in dry quarters well heated by oil lamps, round which they could cluster, appeared to be in a half-dying condition and looked exceedingly unhappy. On being placed before a bright coal fire, recovery was rapid, and they became so lively in an hour or so that they were often difficult to recapture.

Contrary to the experience of Prof. Hill with animals (NATURE, April 3, p. 487), close up electric lamps apparently do not exert a similar beneficial influence on chickens. A visit to any establishment in this city where these birds depend on electric lamps for warmth and in part for light will bear this out.

J. D. FULTON.

The University,
Glasgow.