the use of alcohol, the raising of the standard of parental fitness, and similar problems. In a detached appendix the dangers of venereal diseases are frankly pointed out. The author's general position is that much is to be attained by greater cleanliness, increased control of the hours and conditions of labour, and improved environment for children, but that there must also be some way of preventing the decisively unfit from becoming parents. The book is competent and wise, but some of the statements seem to us to require safeguarding. The citations as to child labour "in the greatest canning factory" in America are so terrible that we hope there is some mistake. The date should have been given. The book is dedicated to "Boys and Girls, the Guardians of the Next Generation," but we hope we are right in understanding that it is meant only for the teacher's use.

Principles of Physical Geography. By G. C. Fry. Pp. x+151. (London: W. B. Clive, 1915.) Price 1*s.* 6*d.*

THIS little book contains that part of the author's text-book of geography which deals with physical geography, with some additions on such subjects as map drawing, climate, and the crust of the earth, as well as a new chapter on man and his work. It contains no definite instructions for practical exercises to be worked by the pupil, but the descriptive treatment will prove suitable for students preparing for the examinations mentioned in the author's preface.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Thermionic Current.

IF a carbon filament lamp is silvered inside, and a platinum wire through the side of the glass makes electric connection with the belt of silver, it is easy to experiment with the thermionic current, using a telephone receiver with one terminal to the platinum wire and the other to the water mains.

With an alternating current at 110 volts, a loud note is heard, depending on the frequency of alternation. With a direct current from a dynamo there is sufficient variation in the voltage to obtain a sound just audible at 100, loud at 110, very loud at 130, and it might be described as an uproar at 140 volts. It might be expected that the intensity would increase until the lamp burnt out. Nothing of the sort. At 142 volts the uproar is replaced by dead silence, which continues up to 165 volts, as high as the lamp would stand.

The explanation may be gathered from Langmuir's paper (*Physical Review*, December, 1913). The thermionic current does not increase with the temperature, according to Richardson's law, unless the vacuum is of a high order. With a moderate vacuum the volume charge between the filament and silver causes the thermionic current to remain at a value nearly constant, as the temperature is raised above a certain value. The thermionic current begins by obeying Richardson's law ($i = a\sqrt{T}e^{-\frac{b}{T}}$), and then later approximates to a steady value.

Thus at low voltages variations of voltage cause variations of temperature and consequent fluctuations of thermionic current, heard through the telephone.

Above 140 volts, however, for the particular lamp in question, a change of voltage and of temperature produces no change of current, and hence no sound can be heard in the telephone.

It is possible that this method may prove very convenient for testing the electron emission from various substances in different gases, and it suggests a method of measuring a high vacuum. A. S. EVE.

McGill University, Montreal, March 31.

A Mistaken Butterfly.

WHILE waiting for a car at Pacific Grove, Monterey County, California, on February 12 (Lincoln's birthday) of the present year, I noticed that a man standing near me had the brightly-coloured "eye" of a peacock's feather in the band at the back of his hat. While looking at this I saw a butterfly floating above the man's head. It suddenly lighted on the "eye" and apparently began trying to extract food from it. I directed the man's attention to it; he removed his hat, and we watched the insect for several minutes as it tried to secure food from the feather. It then flew away, as if satisfied that it had made a mistake. I do not know the name of the butterfly, but it was one of many of a light brown colour that seem to be plentiful at Pacific Grove at that season. I was told that these butterflies at a certain time regularly alight in thousands upon a special pine tree (one of a great many) in the western edge of the town, and from this fact they have called it the "Butterfly Tree." I do not know whether these insects seek their food from flowers by the sense of smell or that of sight, but it was evident in the present case that this one was guided entirely by sight.

E. E. BARNARD.

Yerkes Observatory, Wisconsin, U.S.A
March 29.

BRITISH SUPPLY OF DRUGS AND FINE CHEMICALS.

AT a British Association meeting about twenty years ago an eminent physicist received some rough handling from his chemical colleagues on account of the impurities which were manifestly present in the materials he had used in his experiments. He replied, in effect, that chemists should employ themselves in purifying chemicals for physicists to use. Nowadays chemicals such as he would have desired are made by the ton, chiefly by three firms in Germany. For ordinary chemical, and even physical, research such fine materials are turned out that it may be doubted in many cases if the work done with them is worthy of such refinement. Frequently the chemicals used are better than the chemist who works with them could have produced for himself. For work of the highest degree of refinement, such as the determination of atomic weights, the chemicals which can be purchased cannot be used with-