melted. Later they substituted for this a specially constructed composite anode which yielded the rays without the necessity of external heating.

Both these methods have been employed recently at the Cavendish Laboratory to investigate the constitution of lithium, the rays produced being analysed by Sir J. J. Thomson's "parabola" method which gives ample resolving power for this element.

By means of the composite anode (G. P. Thomson, Proc. Camb. Phil. Soc., vol. xx., p. 211, 1920) a number of plates were taken showing in several cases double parabolas corresponding to 6 and 7, but owing to the fact that spurious doubling had occasionally occurred, due to instrumental trouble, publication was withheld.

It has now been found possible to apply the externally heated anode, employed by Dempster in 1918 for potentials of about 1000 volts, to high potential rays. This arrangement is used at very low pressures, and under these conditions *metallic rays only* appear to be produced.

Exceedingly satisfactory parabolas corresponding to lithium have been obtained, a strong one at 7 and a faint companion at 6 (Na=23). The intensity of the latter appears to correspond well with the accepted atomic weight 6·94.

The foregoing results appear to leave no doubt that lithium is a complex element with isotopes of atomic weights 6 and 7. Of course, no accuracy can be claimed for these figures until higher resolution has been applied, but there seems no reason to doubt that they are very nearly whole numbers.

F. W. ASTON.
G. P. THOMSON.

Cavendish Laboratory,
February.

The Elementary Particle of Positive Electricity.

THE name "negative electron" was applied to the elementary particle of negative electricity after the experimental evidence for the variation of its mass with velocity had generally convinced physicists that its whole inertia was due to its electric charge. This meaning of the term "electron" was in accord with Dr. Johnstone Stoney's original use of the word to denote the elementary unit of electric charge. With the introduction of the principle of relativity it became clear that the variation of mass with velocity was no characteristic attribute of electrical inertia, and that therefore we have no proof that the negative electron's inertia is wholly electromagnetic in origin. In fact, the investigations of Abraham, Webster, and others have shown that there must be some mass present other than that due to the electron's electric field. If we abide by Dr. Stoney's original meaning of the word, it is therefore more than doubtful whether we are justified in calling this negatively electrified particle of matter an electron. Nevertheless, the term is now so well established in the literature that we use "electron" to denote this elementary particle regardless of our view concerning the origin of its mass.

The arguments for and against the electrical origin of the mass apply in exactly the same manner to the elementary particle of positive as to the corresponding particle of negative electricity. If the negative particle can legitimately be termed an "electron," it is thus equally legitimate to apply the term to the positive particle, since it likewise carries the fundamental unit of electric charge. Why not, therefore, denote both these elementary particles by the same generic term "electron," distinguishing the "positive" from the "negative" electrons when necessary, as several writers have long been accustomed to do?

It seems to me that the application of a distinctive name, such as "proton" or "hylon" or "hydrion," to the elementary particle of positive electricity can only suggest a distinction between the nature of the positive and negative electrons, which, so far as we are aware, does not exist. Thus, for example, when an atom of hydrogen is split into its two components the negative electron is just as really a hydrogen ion as is the positive electron. The fact that both components possess equally fundamental units of electric charge and are equally fundamental divisions of matter should suggest that the same generic name "electron" be applied to each.

ARTHUR H. COMPTON.

Washington University,
St. Louis, U.S.A.,
January 25.

The Peltier Effect and Low-Temperature Research.

I SHOULD like to inquire whether the Peltier effect has ever been considered as an aid to the production of very low temperatures. I understand that the lowest temperatures yet obtained are those produced by Dr. H. K. Onnes, of Leyden, who, by reducing the temperature of metals to that of liquid helium, has got down to within less than 4° of the absolute zero of temperature, or more than 450° below zero Fahrenheit. Onnes, moreover, found that at such a temperature pure metals lose practically all electrical resistance and become nearly perfect conductors.

The suggestion is to apply the Peltier effect, which consists in an observed diminution in temperature when an electric current is passed in a particular direction through a thermo-couple to obtain still lower temperatures.

At ordinary temperatures, when the metals composing the thermo-couple have appreciable resistance, the Peltier effect is largely masked by the C^2R heat produced in the metals by the passage of the current. At the temperatures attained by Onnes, when resistance practically vanishes, this condition should not obtain, with the result that the application of the Peltier effect would appear to give possibilities of obtaining materially lower temperatures than have yet been reached. A. A. CAMPBELL SWINTON.

66 Victoria Street,
London, S.W.1,
February 16.

Heredity and Biological Terms.

IT seems to me that the arguments of Sir Archdall Reid (NATURE, February 3, p. 726) and Sir Bryan Donkin (February 10, p. 758) leave the question of the meaning and use of the term "acquired characters" very much where it was before. Sir Bryan Donkin asks whether it may not be justly argued that if a child has a hand like its parent there is no change in "nature" or "nurture"; that if the child has a sixth digit which the parent had not there is a change in nature or heritage, but none in nurture; and that if the child has a scar there is no change in heritage, but only one in nurture. But I fail to perceive anything new in this or any difference from the usual conceptions which are general among biologists. It is a mere matter of terms and synonyms. The modern biologist would say that the normal hand was hereditary, or innate, or due to certain factors or genes in the chromosomes which usually