

appears to show that the transformation occurring after this range is constant is independent of the manner in which the cold work is applied. Beyond E, however, the new curve does not coincide with ED, but rises more steeply, the tensile strength corresponding with the 0.040 in. diameter wire, being nearly 33 tons per sq. in. It would appear, then, that the change taking place along ED is different in type from that occurring along AE. It is stated that wires of such a diameter that they fall within the range AE are stable at the ordinary temperatures. At any rate, they do not change in a year's time. On the other hand, wires corresponding with the points on the branch ED are unstable at atmospheric temperatures, their tensile strength being gradually diminished. Finally, Mr. Alkins records that, if fully annealed wire of any diameter is taken and drawn down, a stage is always reached, when its area has been reduced about 50 per cent., where, over a limited range, further drawing causes no corresponding alteration in the properties. He finds that the physical properties corresponding with this constant range are always the same—e.g. density=8.889, tensile strength=23.2 tons per sq. in., and so on. He concludes, therefore, that the point E corresponds with a definite physical state of the metal.

The facts thus brought forward by Mr. Alkins are of definite practical importance and distinct scientific interest. Considering the importance of the point E, it would have strengthened his case if he could have shown rather more observations in its immediate neighbourhood. This, of course, would have involved the preparation of a new set of rolls, by which very slight differences in area could be effected. Such work cannot, of course, be undertaken under war conditions. Further, he would have been well advised to determine the percentage of copper-cuprous oxide eutectic in his wire, which he did not do. This omission can, of course, be remedied, and until it is, and the influence of oxide specifically determined, no one can say how far his results are due to copper itself. If and when these omissions can be remedied, Mr. Alkins will improve a paper which already does him very great credit.

H. C. H. CARPENTER.

THE RAT PEST.

REFERRING to Prof. P. Chavigny's report on rats in the trenches (*NATURE*, September 19, p. 53). Mr. C. B. Moffat, Ennisforth, points out that the descendants of a pair of rats must in three years far exceed the twenty millions stated. At the end of the first year there should be 50 offspring, 500 grand offspring, 1000 great-grand offspring, 1250 great-great-grand offspring—2800 in all. Half of this number, supposing females equal males, multiplied by 2800, gives 3,920,000 at the end of the second year. At the end of the third year the number should be far more than five thousand millions. It has to be borne in mind, however, that female rats probably reach their limit or menopause long before three years. The most secure data known to us are those of Helen Dean King (*Anat. Record*, vol. xi., 1916, pp. 269-87) on 76 females derived from a cross between the wild Norway rat and the domesticated white rat. The average number in a litter was 6.7 (Prof. Chavigny speaks of 10); the average total number of litters for a female was 7.7; there is a sharp decline in fertility after the female is a year old, and the menopause appears at eighteen months. The sex ratio for 3955 individuals was 106.1 males to 100 females. We do not know how Prof. Chavigny reached the figure twenty millions, but, as Mr. Moffat recognises, there are various biological considerations which make the computation not so simple as it seems at first.

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Without doubt the most thorough and informative summary of the menace which faces us from the hordes of rats and mice in our midst has just been issued by the Trustees of the British Museum (*Natural History*), forming No. 8 of the Economic Series issued by that institution. The author, Mr. M. A. C. Hinton, one of the greatest living authorities on this subject, has marshalled his facts with extraordinary skill; so much so that he has contrived, within the space of some sixty pages, to pass in review, not only the life-history of these pests in a state of nature, their relation to public health, and their amazing destructiveness in the matter of our food supplies, but also the various preventive measures which afford us means of relief. On this head he has much to say in condemnation of the destruction of so-called "vermin," which, until now, has been so persistently and stupidly followed. Finally, he adds a most valuable chapter on the classification of the Muridæ, and a table showing the assumed rate of increase in the annual rat population, which, even while postulating a mortality which is purposely exaggerated, shows clearly enough that none but the most determined efforts can hope to lessen the seriousness of the situation, which has come about owing to the withdrawal of all labour hitherto devoted to the destruction of rats, either by the needs of the Army or by the allurements of the high wages paid for other kinds of work more or less directly arising out of the war. A number of well-chosen and beautifully executed illustrations, showing the dental and cranial characters by which our native species of Muridæ may be distinguished, add still further to the value of these pages. But the figures of the black and common rat and of the house-mouse, to say the least, leave much to be desired. This pamphlet should be carefully studied, not only by the agriculturist, the merchant, and those responsible for the preparation of food in restaurants, but also by the housekeeper; for it is only by the concerted efforts of us all that we can hope for success in this campaign, which is now to be commenced against a condition of affairs which is fraught with real peril.

THE RALEIGH TERCENTENARY.

THE tercentenary of Sir Walter Raleigh's death was celebrated on Sunday, October 27, by a special service at St. Margaret's Church, Westminster. The service was arranged by the Tercentenary Committee, of which the King is patron, Mr. Balfour one of the honorary presidents, and Prof. Gollancz hon. secretary. Two wreaths in memory of Sir Walter Raleigh were laid before the service at the foot of the Communion-table, where the body is said to have been buried. One was from the Tercentenary Committee; the other, of laurels, was from the Royal Geographical Society, and was inscribed: "To the memory of Sir Walter Raleigh on the tercentenary of his death." It was borne by Sir Thomas Holdich, K.C.M.G., and Mr. Arthur R. Hinks, secretary of the society. The address was delivered by the rector of St. Margaret's, Canon Carnegie. Memorial services were also held at the Temple Church and at Woolwich Parish Church. The work of Raleigh in exploration and colonisation was also commemorated on Tuesday by meetings at the Mansion House and elsewhere. At the Mansion House meeting Sir Charles Wakefield (hon. treasurer of the Tercentenary Committee) offered for the acceptance of the Lieutenant of the Tower a copy of Raleigh's "History of the World," which he hoped would find a place in the room where the history was written. He offered to the British Academy as the nucleus of a Raleigh Fund for History the sum of 500l. a year for at least the next