

### Recent Research on Cancer

IN his reply in NATURE of February 22 to our criticism, Mr. Lockhart-Mummery has set out what he considers are the "exact facts". In fairness to my co-workers and myself, I must point out that the exact facts are as follows:

The actual statement made by myself in my annual report reads: "While our experiments are as yet unfinished we feel we are on safe ground when we say (1) that given a full mixed diet, infestation with the parasite *Gongylonema neoplasticum* induces no changes other than perhaps an occasional trivial hyperkeratosis of the squamous epithelium—certainly there is no papillomatosis and nothing resembling malignant disease: (2) that, given a diet deficiency of the natures stated, the parasite appears to induce some hyperplasia and papillomatosis but again nothing resembling frank malignant disease." Mr. Lockhart-Mummery's paraphrase in his editorial reads: "While no difficulty was found in establishing the presence of the parasite in the oesophagus and stomach of the rats, and in parts of the pharyngeal tract, the experiments have been almost entirely unsuccessful in producing cancer. Since no doubt exists that it was Fibiger's parasite which was employed, the experiments appear to show that, provided the rats are fed on a correct diet, cancer does not develop as a result of this parasitic infection." Thus Mr. Lockhart-Mummery paraphrases part (1) of my sentence only and makes no mention of the highly relevant part (2). If it had been included, it is obvious that there would have been no grounds on which the writer of the article in NATURE, or anyone else, could reasonably have made the statement to which we originally took exception.

Again, in his comment in NATURE of February 22, Mr. Lockhart-Mummery purports to quote me verbatim. It will be seen, however, that he omits the whole of part (2) of my sentence. The omission of part (2) of my sentence makes the quotation incomplete, while the omission of "(1)" conceals the fact that only part of my sentence was quoted.

The inclusion of the word 'almost' in Mr. Lockhart-Mummery's editorial is quite inaccurate in a scientific report. We were *entirely* unsuccessful in producing cancer; my annual report made this quite clear.

R. D. PASSEY.

Department of Experimental Pathology  
and Cancer Research,  
School of Medicine,  
Leeds, 2.  
March 26.

### Chromosomal Relationship between Males and Females in Hymenoptera Symphyta

A RECENT cytological investigation by me of chromosome individuality in three arrhenotokously parthenogenetic species of Hymenoptera Symphyta has yielded evidence which indicates that the relationship between the females and males is not one of diploidy:haploidy, but is of tetraploidy:diploidy. This concept leaves considerably less to be explained with regard to the occurrence of parthenogenesis; but the matter of the abortive meiosis in the spermatogenesis of impaternal males would seem, at first sight, to be elevated thereby to the rank of a first-

rate problem. Resolution of this, however, is still possible along cytogenetic lines on the basis of a principle of gene-controlled meiosis.

Extended application of the idea renders intelligible the phenomena of 'pre-conjugation' observed during maturation of the gametes in the bee, as demonstrated by Nachtsheim<sup>1</sup>, and in *Cynips kollari*, as found by Hogben<sup>2</sup>, as the occurrence in a derived tetraploid of a more or less vestigial synapsis interfering with functional synapsis.

Still more recent work on certain arrhenotokous Tenthredinidæ reveals leptotene and syndesis during prophase of the abortive division. It cannot, however, at present be stated whether the threads entering the syndetic knot are of a dual nature and synaptically paired.

The significance of the observations may be that the appearances represent true synapsis in an organism hitherto regarded as haploid and really diploid, or that they are of stages through which chromosomes pass, at this stage of gametogenesis, irrespective of whether homologous mates are present or not. In the former case emphasis would be placed on failure of the spindle mechanism, known to occur, in securing non-reduction.

FRANK GREENSHIELDS.

4 Airlie Terrace,  
Dundee.  
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<sup>1</sup> Nachtsheim, *Archiv Zellforsch.*, 11 (1913).

<sup>2</sup> Hogben, *Proc. Roy. Soc.*, B, 91 (1920).

### Accommodation Coefficient of Deuterium

IN attempting to find the relative times of life of hydrogen and deuterium molecules on a bare platinum surface, preliminary results have been obtained for the accommodation coefficients of hydrogen, deuterium and helium relative to a normal (that is, unflashed) platinum wire, the wire having been annealed at red heat in air for about one minute to remove strain.

The publication of these results may be of interest on account of their applicability, at least in so far as relative magnitudes are concerned, to determinations, by methods of thermal conduction at low pressures, of deuterium concentrations in hydrogen.

With the wire at a mean temperature of 100.7° C. and the surrounding gas at temperatures of about 16° C., the accommodation coefficients of hydrogen, deuterium (99.2 per cent) and helium were found to be 0.24<sub>3</sub>, 0.30<sub>8</sub> and 0.29<sub>4</sub> respectively.

In calculating the value of the accommodation coefficient, the ratio of the specific heats of deuterium in this temperature range has been assumed equal to that of hydrogen. The deuterium used was the product of the total decomposition by sodium of heavy water of guaranteed 99.2 per cent content of deuterium oxide. While the actual proportions of D<sub>2</sub>, HD and H<sub>2</sub> molecules are not known, the percentage of these two latter is not sufficient to affect the result obtained for deuterium.

W. B. MANN.

W. C. NEWELL.

Imperial College of Science,  
London, S.W.7.  
March 21.