that amidines react with phenylhydrazines in such a manner that the imino group is exchanged for the reactive group of the hydrazine.

It is also of interest to note that the reaction of the 2,4-dinitrophenylhydrazine under our mild hydrolytic conditions is by no means continuous. Curves showing the relation between time of hydrolysis and colour intensity of the solution in sodium hydroxide of the fraction precipitated by trichloracetic acid exhibit definite discontinuities which are, in principle, reproducible. A pair of typical curves is shown in the accompanying graph. While no explanation of the phenomenon can be given at present, it is conceivable that it is connected in some manner with a successive destruction and regeneration of groups capable of fixing the hydrazine. This in turn may be related to the discontinuous liberation of tyrosine and arginine which we have observed colorimetrically in the filtrates from the trichloracetic acid precipitations in the absence of 2,4-dinitrophenylhydrazine.

An extended account of this work will be published elsewhere.

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Distribution of Nucleic Acid in the Cell

THE statements which Stedman and Stedman[1,2,3] have published in NATURE must, it seems, be considered from two points of view. First, there is their chemical analysis leading to the discovery of "chromosomin". Secondly, there are the biological consequences which they have inferred from this discovery. Clearly, the chemical analysis is the foundation of everything else; but since no particulars of this analysis have been published, we can deal only with the superstructure.

The chief of Stedman and Stedman's inferences concerns the distribution of thymo-nucleic acid in the nucleus. They infer that the bulk of the thymonucleic acid lies in the nuclear sap, not in the chromosomes. Their own tables, however, demonstrate the contrary. They have determined the proportion of thymonucleic acid in the dry weight of nuclei varying between the extremes of no nuclear sap in cod sperm to, say, 90 per cent in carcinoma cells. The small variation in proportion of thymonucleic acid is not correlated with the proportion of nuclear sap. Yet it is on the basis of these results that Stedman and Stedman proceed to dismiss the work of Mazia and Jaeger, Caspersson, Norberg and Barigozzi[4], who by four different methods have converged on the conclusion that thymonucleic acid exists in the cell only in structural relationship with the chromosomes.

This conclusion continues to be reinforced by new evidence. For example, Claude and Potter[5] have recently, by a simple technique, isolated chromosome threads from resting nuclei. By chemical analysis of the threads they conclude that 40 per cent is thymonucleic acid, which agrees closely enough with the proportion determined by Norberg, and the threads were, of course, Feulgen positive. Thus thymonucleic acid was evidently attached to the chromosome threads before their isolation. Stedman and Stedman's theory of indirect staining by Feulgen's reagent becomes meaningless in the light of this experiment. On the other hand, Choudhuri's observation[6] of the staining of chromosomes by "developed Feulgen reagent", which has been used by Stedman and Stedman in support of their theory, is, of course, merely another example of the use of a basic dye.

Stedman and Stedman's view that thymonucleic acid is the main solid constituent of the nuclear sap leads them further: "it is an attractive hypothesis", they say[1], "but one for which there is no direct experimental proof, that the spindle which is formed at metaphase is a gel of nucleic acid". Later[3] they state, without additional evidence, that "there seems little doubt that nucleic acid is concerned mainly with spindle formation".

Darlington[7] has given reasons for believing that the development of the spindle depends on a reaction between the centromeres of the chromosomes and fibre-forming molecules of a type not usually found within the nuclear membrane. The spindle can therefore develop only after the breakdown of the nuclear membrane. With regard to the nature of these fibre-forming molecules, most workers have contented themselves with the evidence that the spindle, like other cytoplasmic constituents, does not contain thymonucleic acid. On this point the work of Schmidt and others on birefringence is directly significant. Schmidt[8], Runström[9] and Nakamura[10] have shown that the spindle fibres are positively birefringent with respect to their length, whereas pure sodium thymonucleate fibres are negatively birefringent, thus giving the peculiar optical properties actually found in the chromosomes.

In the light of this evidence, we feel that the position and function of "chromosomin" in the nucleus will have to be determined in relation to the already well-established position and function of thymonucleic acid.

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Dec. 15.

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Influence of an Adsorbed (Inner) Layer on the Cohesion of a Solid

IN a previous communication[1] attention was directed to the influence of adsorption in causing the phenomenon of floating drops. In other words, an adsorbed layer (in particular of gases), when enclosed within a liquid, may lessen its cohesion so that no coalescence takes place, the adsorbed layer acting as a barrier. Thus a drop of molten paraffin—where adsorption may be expected—persists for a relatively long time, say, 1 min., on a paraffin surface.

These observations were extended to solid paraffin, using the following principle. Two plane surfaces

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