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Lost Chromosomes in Endometrial Cells*

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In a previous paper (Bowey and Spriggs, 1967) we described the findings in direct chromosome preparations from human endometrium. Besides cells with the normal complement of 46 chromosomes, there were many with missing chromosomes (as has been also found in other types of material). Whether these chromosomes were missing in the original cells *in vivo*, or were lost during preparation, was left an open question. We now have data to elucidate this.

In scanning chromosome preparations to find suitable well-spread metaphases, it is necessary to use a low magnification (e.g. × 60). Whole cells in mitosis are easily seen and then examined closely under a higher power. In these conditions, individual loose chromosomes and small groups of chromosomes are difficult to see, and in any case obviously broken cells are intentionally rejected.

Our first impression, probably shared by others, was that loose chromosomes present on the slide were not nearly numerous enough to account for the hypodiploid cells found in the same material. A closer look has now revealed that this was mistaken.

Using only the preparations in which dividing cells were most numerous, one of us (C.E.B.) carefully searched 12 slides (made by air-drying as previously described), using × 10 eyepieces and a × 10 objective. Every well-spread group of chromosomes found was then counted under a × 100 objective, whether the cells appeared to be broken or not. The Fig. shows a histogram of counts made by combining the results. Eight of the slides were from one case, two from another, and one slide each from four other cases. All showed the same phenomenon—a concentration of small groups or single chromosomes on the left of the histogram, roughly balancing the loss of chromosomes on the right. The unduly high figure for single chromosomes may perhaps be explained by separation of individual chromosomes from some of the small groups as well as from otherwise intact cells. At every level the same effect may explain the excess in each column on the left over the corresponding loss on the right. There are, however, likely to be considerable inaccuracies from two sources; first, small fragments tend to be better spread and are therefore more often 'countable' than large ones or whole cells; and second, single chromosomes and very small groups are disproportionately likely to be invisible due to overlapping of interphase nuclei, or in the case of the F and G groups simply missed owing to their small size. These two causes of error operate in opposite directions.

We had hoped to identify the separated chromosomes in order to see whether their 'loss' was random. They were for the most part well displayed

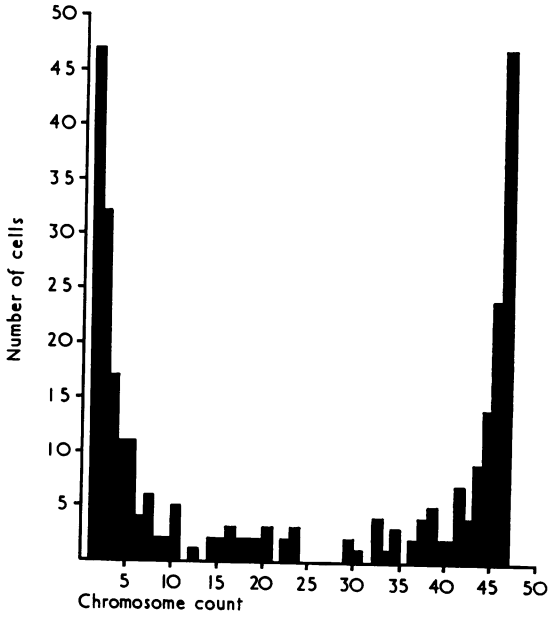

FIG.

* This note is a rider to a paper by Bowey and Spriggs (1967) published last year.

and were easy to photograph and to measure. Unfortunately, chromosome identification depends on comparison within the set in any given cell, and with single chromosomes or groups of very few it is often impossible to place them reliably in their correct position, especially the submetacentrics.

To summarize, it appears that the presence of hypodiploid cells is fully explained by breakage of dividing cells at the time of preparation.

REFERENCE

Bowey, C. E., and Spriggs, A. I. (1967). Chromosomes of human endometrium. *J. med. Genet.*, **4**, 91.