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The photographs on the cover show the chromosomes and spindle at the first meiotic division in a spermatocyte of the grasshopper *Chorthippus (Stenobothrus) lineatus*. They were published in 1929 by Karl Bélař in a paper entitled *Beiträge zur Kausalanalyse der Mitose* (Contributions to the causal analysis of mitosis). The four photographs follow a single spermatocyte for about 80 minutes after the testis was removed from the living animal and squashed gently under a coverslip in body fluid. One can see the oscillations of the bivalents along the major axis of the spindle and the spectacular pole-to-pole migration of the unpaired X-chromosome (arrow in Figures 41 and 42). The spindle itself is most clearly shown in Figure 40, where the vertical lines indicate the poles and define the major axis. These photographs were taken some 20 years before the introduction of phase contrast, and even longer before modern digital enhancement techniques. All contrast was obtained by careful manipulation of the apertures on the lamp and substage condensers, methods familiar to an earlier generation of light microscopists, who had no other way to bring out details in living cells. In other experiments Bélař subjected cells to hypertonic salt solutions and saw the spindles elongate into bizarre structures several times their original length. He thought these experimental spindles mimicked the normal process by which the chromosome groups were pushed apart at anaphase. What Bélař did not know (nor did I, until Bruce Nicklas told me) is that hypertonic treatment induces massive polymerization of new microtubules that have little to do with normal mitosis. Bélař died at the age of 36 shortly after carrying out these pioneering experimental studies on living cells at the Kaiser Wilhelm-Institut für Biologie in Berlin. In his brief career he also published an extraordinary monograph on shape changes (i.e., mitosis and other events) in nuclei of protozoa: *Der Formwechsel der Protistenkerne* (Gustav Fischer, 1926).
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Cover
The photographs on the cover show the chromosomes and spindle at the first meiotic division in a spermatocyte of the grasshopper Chorthippus (Stenothrhus) lineatus. They were published in 1929 by Karl Bélaft in a paper entitled Beiträge zur Kausalanalyse der Mitose (Contributions to the causal analysis of mitosis). The four photographs follow a single spermatocyte for about 80 minutes after the testis was removed from the living animal and squashed gently under a coverslip in body fluid. One can see the oscillations of the bivalents along the major axis of the spindle and the spectacular pole-to-pole migration of the unpaired X-chromosome (arrow in Figures 41 and 42). The spindle itself is most clearly shown in Figure 40, where the vertical lines indicate the poles and define the major axis. These photographs were taken some 20 years before the introduction of phase contrast, and even longer before modern digital enhancement techniques. All contrast was obtained by careful manipulation of the apertures on the lamp and substage condensers, methods familiar to an earlier generation of light microscopists, who had no other way to bring out details in living cells. In other experiments Bélaft subjected cells to hypertonic salt solutions and saw the spindles elongate into bizarre structures several times their original length. He thought these experimental spindles mimicked the normal process by which the chromosome groups were pushed apart at anaphase. What Bélaft did not know (nor did I, until Bruce Nicklas told me) is that hypertonic treatment induces massive polymerization of new microtubules that have little to do with normal mitosis. Bélaft died at the age of 36 shortly after carrying out these pioneering experimental studies on living cells at the Kaiser Wilhelm-Institut für Biologie in Berlin. In his brief career he also published an extraordinary monograph on shape changes (i.e., mitosis and other events) in nuclei of protozoa: Der Formwechsel der Protistenkerne (Gustav Fischer, 1926).
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