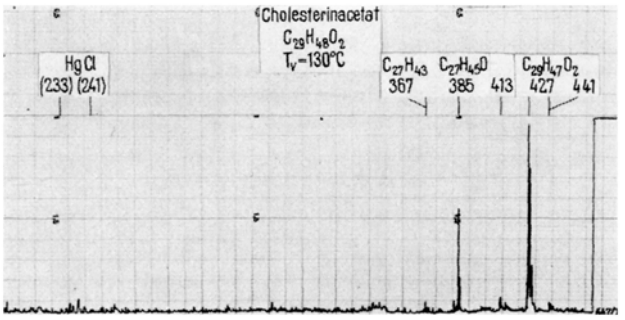

Photometrische Registrierung des Molekülmassenspektrums von Cholesterinacetat (3β-Acetoxy-cholest-5-en), $C_{29}H_{48}O_2$; M = 428.

Summary. The molecular weight of various steroids (sterols, steroidal sapogenins, and alkaloids) as well as the molecular weight distribution in complex mixtures of similar steroids, has been exactly determined by application of 'molecule mass spectrography'. In this technique, negatively-charged ($p - 1$) ions are formed, usually without further fragmentation. The advantages and new possibilities of this method are discussed.

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Forschungsinstitut Manfred von Ardenne, Dresden-Weisser Hirsch; Deutsche Akademie der Wissenschaften zu Berlin, Institut für Kulturpflanzenforschung Gatersleben, Kreis Aschersleben (DDR), 27. Dezember 1962.

Potassium and the Reactivity Pattern of the Isolated Human Myometrium to Prostaglandin from Human Seminal Fluid[1]

It appears that the muscle cells of the rat and rabbit myometrium are in principle affected by variations of the extracellular potassium concentration in the same way as other excitable organs, i.e. increased concentration of potassium causing partial depolarization, increased spontaneous motility and increased excitability to electrical stimuli[2,3]. It is not clear to what extent these changes are associated with variations also in the sensitivity to autopharmacological substances. Studies in our laboratory indicate that the isolated human myometrium is influenced by variations in the extracellular potassium concentration in the same way as the rat and rabbit uterus (to be published).

The isolated non-pregnant human myometrium is stimulated by most autopharmacological compounds[4], while prostaglandin usually causes a decrease of the motility[5]. Some uterine preparations respond, however, with an increased motility if a very small dose of prostaglandin is added to the bath fluid, but this reaction is changed to inhibition if a slightly larger dose is added[5,6]. Since the reactivity pattern of the human myometrium may be of importance for normal fertility, further studies on factors that may influence this reactivity pattern are warranted.

The method used in the present investigation is fully described elsewhere[6]. Immediately following surgical removal of the uterus suitable pieces of myometrium were taken from corpus uteri and suspended in cold Ringer's solution. Four strips of equal size (about 20 × 2 × 2 mm) were then cut out. Each strip was mounted in a 40 ml cuvette in an isolated organ bath. Temperature, gas flow, pH etc. were controlled during the experiments. The motility of the four strips was recorded simultaneously and almost isometrically on a smoked drum, using frontal writing levers with an amplification of 25:1. Histological determinations of the phase in the menstrual cycle were performed on all uteri. The prostaglandin preparation was extracted with two volumes acidified acetone from pooled human seminal fluid. After filtration the acetone was evaporated under reduced pressure and the pH adjusted to 7.4 with NaOH. The resulting aqueous solution was used in these experiments. The biological activity was determined against a standard preparation according to ELIASSON[5].

In all experiments (36 strips from 9 uteri) the effect of potassium on the reactivity pattern of the myometrium to prostaglandin was similar to that illustrated in Figures 1 and 2. Lowering the potassium below the normal concentration in the Tyrode solution (5.6 mEqv/l) increased the inhibitory response to prostaglandin. The opposite effect was obtained when the potassium concentration was increased. Moreover, in some experiments, the inhibitory response to prostaglandin changed to stimulation when the potassium concentration was in the upper region (13–16 mEqv/l) of that used in these experiments.

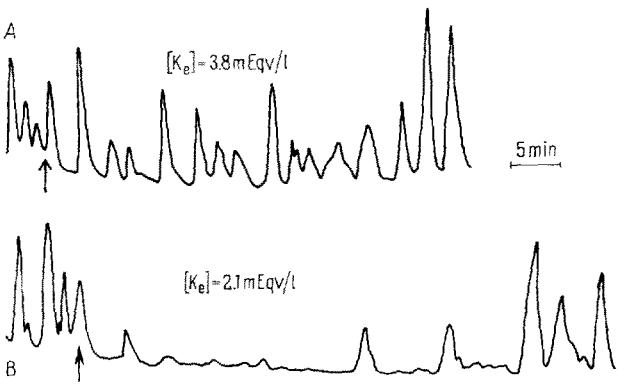

Fig. 1. The effect of extracellular potassium concentration $[K_e]$ on the response of the isolated human myometrium in late proliferative phase to prostaglandin from human seminal fluid. At arrows: 0.01 U prostaglandin from human semen per ml bath fluid.

From results to be published elsewhere it is apparent that also for the isolated human myometrium there is a linear relationship between the number of contractions per time unit and the extracellular potassium concentration within the range of 4–16 mEqv/l. It is therefore most likely that potassium causes similar changes in the mem-

[1] Financial support from the Lalor Foundation, the Karolinska Institutet, and the Lars Hiertas Minne is thankfully acknowledged.

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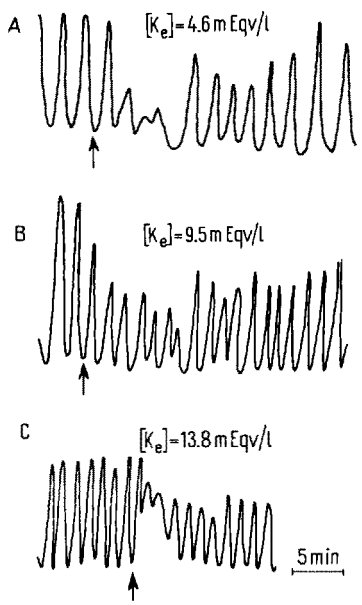

Fig. 2. The change of reactivity pattern of another strip from the same uterus as in Figure 1 when the extracellular potassium concentration is increased. At arrows: 0.01 U prostaglandin from human semen per ml bath fluid.

brane potential of the human myometrium as has been demonstrated for the rat uterus, i.e. increase in the extracellular potassium concentration causes a partial depolarization[3]. It is tempting to assume that the enhancement of the inhibitory effect of prostaglandin when the potassium concentration is lowered is due to the hyperpolarization. On the other hand, the effect on the membrane potential caused by agents that produce a decrease in motility and/or tonus of the uterus is almost unexplored and one can therefore at present only speculate on the possible mechanism. The reinforcement of the inhibitory effect of prostaglandin at low potassium concentration reported in this communication appears of interest since it may open a new approach to study some basic mechanism behind the contraction-relaxation process in the smooth muscle.

Zusammenfassung. Das Reaktionsmuster des nichtgraviden menschlichen Myometriums *in vitro* auf Prostaglandin wird durch die extrazelluläre Kaliumkonzentration beeinflusst. Senkt man die Kaliumkonzentration, so wird der hemmende Effekt gesteigert, erhöht man sie, so wird die hemmende Reaktion nicht nur vermindert, sondern kann zuweilen auch in Stimulierung umschlagen.

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Meiotic Chromosomes of the Small Indian Lark (*Alauda gulgula gulgula*)

In spite of the remarkable progress made in the past few years in our knowledge about the karyotypes of some higher vertebrates, birds continue to be cytogenetically the least known. Due to some peculiar technical difficulties like the high diploid numbers, small size of elements and their exceptionally strong tendency to clump, avian chromosomes have eluded many attempts at their analysis, so much so that some workers have gone to the extent of doubting the very chromosomal status of some of the smaller elements (Newcomer[1]).

Whereas in general there has been no confusion about the larger elements (macrochromosomes), the smaller dot-like elements, variously called micro chromosomes, chromosomoids or accessory chromosomes, have often been difficult to study with routine cytological methods. With the help of some special prefixation treatments, it has recently been possible to study these refractory elements in an unclumped state from the germinal and somatic tissues of various domestic and wild birds (Van Brink[2], Ohno[3], Sharma et al.[4], Krishan[5-7]).

The present study has been made on adult testicular material of the small Indian lark, treated with hypotonic Ringer's salt solution and subsequently squashed in propionic carmine.

In Figure 1 of a first meiotic metaphase, there are eleven large bivalents forming the peripheral part of the rosette-shaped plate and surrounding the 29 small bivalents which range in size from spheres of appreciable size to some minute dots. Except for the largest bivalent, which has a J-shaped structure indicating a sub-median kinetochore, all the remaining peripheral elements are too condensed and short to reveal any constriction or bend.

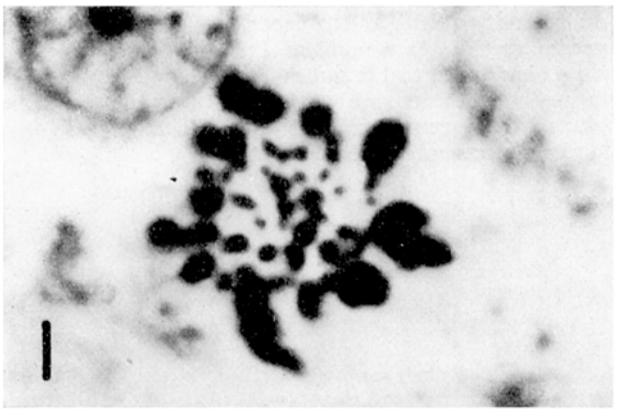

Fig. 1
Meiotic metaphase I plate showing 40 bivalents. ×5200 approx.

In about twelve first meiotic metaphase plates from temporary as well as permanent preparations, a variable number of bivalents between 38 and 42 was observed.

Whereas in the first meiotic metaphase the largest bivalent shows a sub-median bend, in the second metaphase it is very much condensed and appears as a rela-

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