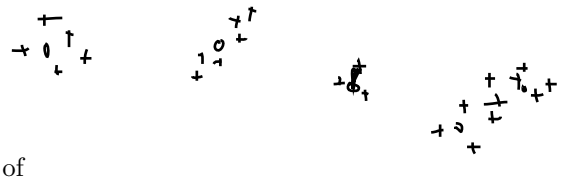

mean no. point
in a cluster ...

Parents ~ Po.P
offsprings ~

$\lambda = \lambda_p \cdot \lambda_c$

**7.** Determine the pair-correlation function of

a) the Thomas process, $N_d(0, \sigma^2 \cdot I)$

b) the Matérn cluster process for $d = 2$. $U(b_r(\sigma, \pi))$

a) Theorem 55: $g(x) = 1 + \frac{h(x)}{\lambda_p}$, $x \in \mathbb{R}^d$ ... stationary

$x = y$ ... $X_1 + X_2$ iid $g(x,y) = g$ $x, y \in$

$$h(x) = \int_{\mathbb{R}^d} f(y) f(y - x)\, dy$$

displacement of offsprings around a parent point

$N_d(0, \sigma^2 I)$: $f(x) = \frac{1}{(2\pi)^{d/2} \sigma^d} \exp\left\{ -\frac{1}{2\sigma^2} x^T x \right\}$, $x \in \mathbb{R}^d$

$h(x)$ ... $X_1, X_2$ i.i.d. $\sim f$ $\Rightarrow$ $h(x) \sim X_1 - X_2 \sim N_d(0, 2$

$$h(x) = \frac{1}{(2\pi)^{d/2} (\sqrt{2}\sigma)^d} \exp\left\{ -\frac{1}{4\sigma^2} x^T x \right\}, \quad x \in \mathbb{R}^d$$