$$\ell_n(\theta) = \sum_{i=1}^{r} t_i(x) g_i(\theta) - h(\theta) + u(x)$$

$$= \sum_{i=1}^{r} y_i \psi_i - h(\theta) + u(x)$$

$$f_\theta(x) = \exp\left(\sum_i y_i \psi_i - h(\theta) + u(x)\right)$$

$$1 = \int f_\theta(x)\,dx = e^{-h(\theta)} \int \exp\left(\sum_i y_i \psi_i + u(x)\right) dx$$

$$\frac{\partial}{\partial \psi_k}\left[\sum_{i=1}^{p} y_i \psi_i - c(\psi)\right]$$

$$= y_k - \frac{\partial c(\psi)}{\partial \psi_k}$$

$$\nabla \ell(\psi) = y - \nabla c(\psi)$$

$$E\left(y - \nabla c(\psi)\right) = 0$$

$$\|$$

$$E(y) - \nabla c(\psi)$$

so

$$E(y) = \nabla c(\psi)$$

$$\mathrm{var}\left(y - \nabla c(\psi)\right) = -E\left(-\nabla^2 c(\psi)\right)$$

$$\begin{array}{ccc} \mathrm{var}(y - \nabla c(\psi)) & & -E(-\nabla^2 c(\psi)) \\ \| & & \| \\ \mathrm{var}(y) & & \nabla^2 c(\psi) \end{array}$$

$$\sum_{j=1}^{n}\left[\sum_{i=1}^{p} t_i(x_j)\, g_i(\theta) - h(\theta)\right]$$

$$\sum_{i=1}^{p} g_i(\theta) \sum_{j=1}^{n} t_i(x_j) - n h(\theta)$$