$\Rightarrow \; d\,P(\Theta) = d\,\tilde{P}(\Theta, \cdots \Theta) = \sum_i (-1)^{d_1 + \cdots + d_{i-1}} \tilde{P}(\Theta, \cdots, D\Theta, \cdots \Theta)$

$= 0$, since $D\Theta = 0$. ⅃

Finally, with D_t, θ_t, Θ_t and η as above we see that $(\partial/\partial t)\,\Theta_t = D_t\eta$, and so

$$d(k\,\tilde{P}(\eta, \Theta_t, \cdots \Theta_t)) = k\,\tilde{P}(D_t\eta, \Theta_t, \cdots \Theta_t)$$
$$= k\,\tilde{P}(\tfrac{\partial}{\partial t}\Theta_t, \Theta_t, \cdots \Theta_t)$$
$$= \frac{\partial}{\partial t} P(\Theta_t).$$

Γ $\quad D_t = \tilde{D} + t\eta \qquad \theta_t = \tilde{\theta} + t\eta$

$$\Theta_t = d(\tilde{\theta} + t\eta) - (\tilde{\theta} + t\eta)\wedge(\tilde{\theta} + t\eta)$$
$$\Rightarrow \left(\frac{\partial}{\partial t}\right)\Theta_t = d\eta - \eta\wedge(\tilde{\theta} + t\eta) - (\tilde{\theta} + t\eta)\wedge\eta$$
$$= d\eta - (\eta\wedge\tilde{\theta} + \tilde{\theta}\wedge\eta) - 2t\,\eta\wedge\eta.$$

$$D_t\,(D - \tilde{D}) = D_t\eta = D_t D - D_t\tilde{D}$$

$$D_t\eta = ? \qquad (D_t\eta)(\xi) = D_t(\eta(\xi)) - \eta(D_t\xi)$$
$$= D_t(\eta(\xi)) - \eta((D + t\eta)\xi)$$
$$= D_t(\eta(\xi)) - \eta(d\xi + \theta\wedge\xi + t\,\eta\wedge\xi)$$
$$= d(\eta(\xi)) + \theta\wedge\eta(\xi) + t\eta(\xi) - \eta(d\xi) - \theta\wedge\eta(\xi) - t\,\eta\wedge\eta(\xi)$$
$$= (d\eta)(\xi) - \eta(d\xi) + \theta\wedge\eta(\xi) - \eta(d\xi)$$

not correct.