

**Lemma 0.1.** *Suppose  $A \subseteq^\omega \omega$  has a  $\kappa$ -semiscale. Then  $A$  is  $\kappa$ -Souslin.*

*Proof.* Let  $(\phi_n \mid n < \omega)$  be a  $\kappa$ -semiscale on  $A$ . Let

$$T = \{(x \restriction n, (\phi_0(x), \phi_1(x), \dots, \phi_{n-1}(x))) \mid x \in A\}.$$

Clearly  $T$  is a tree and  $A \subseteq p[T]$ . On the other hand, if  $x \in p[T]$ , fix  $f: \omega \rightarrow \kappa$  such that  $(x, f) \in T$ . For each  $n < \omega$  there is now some  $a_n \in A$  of length  $A$  such that  $(x \restriction n, f \restriction n) = (a_n \restriction n, (\phi_0(a_n), \dots, \phi_{n-1}(a_n)))$ . We have  $\lim_{n < \omega} a_n = x$ . Furthermore, for all  $m < n < l < \omega$ ,

$$\phi_m(a_n) = \phi_m(a_l),$$

i.e.  $(\phi_m(a_n) \mid n < \omega)$  is eventually constant and thus  $x \in A$ . □