

# Antler Development

*Antlers grow according to nutrition, good or otherwise. Antler quality is, in the main, influenced by nutrition, the genetic quality, the age of the individual and the environmental conditions which influence his life. While genes influence the shape of the antler, genes, nutrition and age determine its size*

Robert D. Brown, 1983

**D**rawing heavily on the mass of worldly literature pertaining to antlers, as well as research conducted at the Pendleside and Bunyip sambar enclosures, this chapter tracks the development of antlers from the formation of the pedicle, the growth of the velvet antler, the cleaning of the velvet and hardening of the antler to the eventual casting (shedding). This chapter also explains why antlers vary greatly in size and why some are malformed.

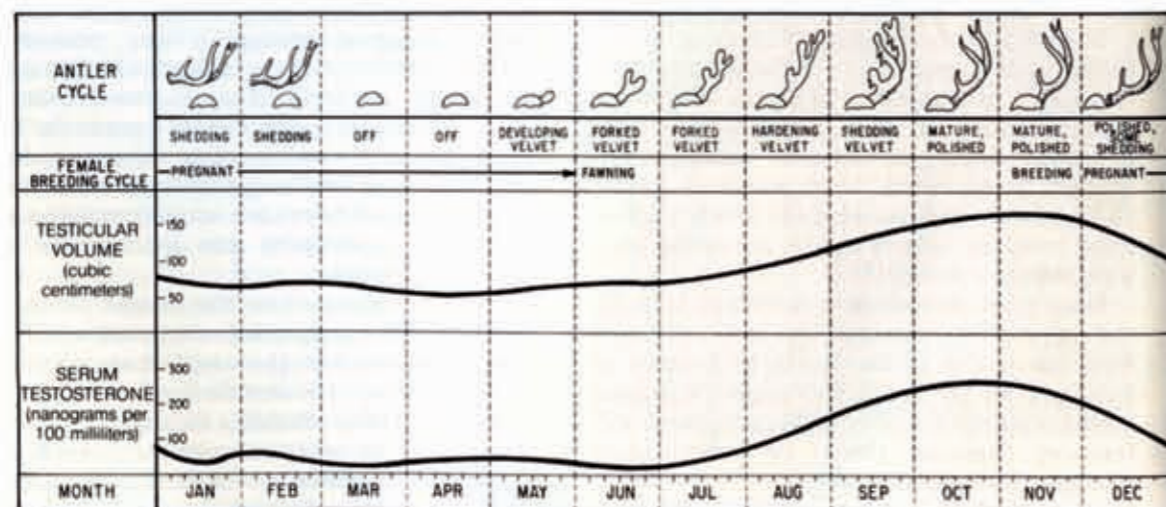
### Role of Testosterone in the Antler Cycle

Antlers are outgrowths of the skeletal system which deer grow and shed annually. The formation of antlers begins in the young stag when he first produces small amounts of the hormone testosterone. Testosterone, which is produced by

the testes, stimulates the formation of the pedicle, the place on the skull where antler growth begins anew each year. The seasonal release of testosterone causes the antlers to harden into bone and the seasonal regression of the testes causes the antlers to be cast each year (see Table 4).

### The Growing Antler

During development, which takes from four to six months for sambar, the growing antlers are covered with a sensitive integument coated with hair. This skin, which is known as velvet, not only covers the growing antler, but also nourishes it. An important characteristic of velvet is the density of sensitive nerve endings which, according to antler scientists Anthony and George Bubenik, is the highest known among mammalian skin. As the



**Table 4:** Relationship of antler growth and breeding cycle to testicular size and serum testosterone in white-tailed deer. Source: McMillin et al 1974 in Halls (1984).

