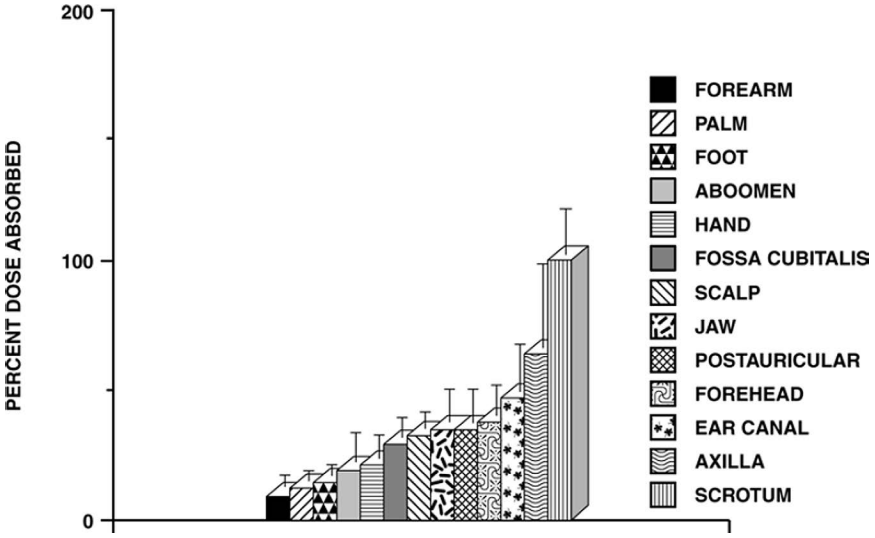

FIGURE 9.1 Anatomical regional variation with parathion percutaneous absorption.

9.1.2 Regional Variation in Humans

Feldmann and Maibach (1) were the first to systemically explore the potential for regional variation in percutaneous absorption. The first absorption studies were done with the ventral forearm because this site is convenient to use; however, skin exposure to chemicals exists over the entire body. They first showed regional variation with the absorption of parathion (Figure 9.1). The fact that the scrotum was the highest absorbing skin site (scrotal) cancer in chimney sweeps is the key. Among other body sites, skin absorption was lowest for the foot area and higher around the head and face area.

Data in Table 9.1 illustrate the influence of anatomical region on the percutaneous absorption of two common pesticides, parathion and malathion, in humans (2). There are two major points in this

TABLE 9.1
Effect of Anatomical Region on *In Vivo* Percutaneous Absorption of Hydrocortisone and Two Pesticides, Parathion and Malathion, in Humans *In Vivo*

	Dose Absorbed (%)		
Anatomical Region	**Hydrocortisone**	**Parathion**	**Malathion**
Forearm	1.0	8.6	6.8
Palm	0.8	11.6	5.8
Foot, ball	0.2	13.5	6.8
Abdomen	1.3	18.5	9.4
Hand, dorsum	—	21.0	12.5
Forehead	7.6	36.3	23.2
Axilla	3.1	64.0	28.7
Jaw angle	12.2	33.9	69.9
Fossal cubitalis	—	28.4	
Scalp	4.4	32.1	
Ear canal	—	46.6	
Scrotum	36.2	101.6	