performed only in the period from late April to late September at air temperatures at the nest site between 15° C and 22° C.

The regressions of population size figure **A** against outer nest diameter **d** were surprisingly different in polygyneous and monogyneous nests of all phenotypes. For polygyneous nests I got

$$A = 0.0024\ d^{1.867} \qquad (r = 0.8648,\ n = 132,\ p < 0.0001)$$

and for monogyneous nests

$$A = 0.00888\ d^{1.386} \qquad (r = 0.6082,\ n = 91,\ p < 0.0001).$$

These functions confirm the above statement that monogyneous nests have for equal **d** a distinctly lower population size. One possible explanation for this difference gives the higher physical strength of workers in monogyneous nests which use significantly larger particles for mound construction and show a behavioural trend to build up steeper mounds.

The largest nest of **pht P** (nest No 227) I found in East Germany had a basal area of 23.8 m^2 and an estimated A of 550 dm^2. A **pht P** nest still larger was shown me by G. Dlussky at Svenigorod Moscow District in 1985. A measuring of this giant nest was not performed but I estimated the mound alone to have 6 by 8 meters basal diameter (or at least 39 m^2 basal area) and a height of 1.5 meters. An attempt of Dlussky and Zacharov (Dlussky, pers. comm.) to estimate the population number of this nest resulted in 15 million individuals. The walking movements of the workers produced a noise well perceptable by the human ear still 30 meters away from the nest.

		pht P^P	pht P^M	pht I^P	pht I^M	pht R^P	pht R^M
HW	mean	1576	1794	1646	1793	1639	1817
[μm]	SD	102	48	79	61	68	77
	n	18	3	22	8	25	27
d	mean	204	79	140	94	98	92
[cm]	SD	122	28	74	36	50	41
	n	93	2	42	7	29	101
	maximum	550	90	300	120	250	200
A	mean	71.5	7.8	31.0	5.79	16.4	5.65
[dm^2]	SD	89.2	8.2	27.1	2.25	14.6	3.77
	n	101	2	44	8	29	111
	maximum	550	13.5	111	8.1	61.6	19.1

Table 4 Nest means **HW** of worker head width, outer nest diameter **d**, and population size figure **A** of polygyneous and monogyneous nests of all phenotypes. The **HW** were taken from the 103 representative samples from which the discriminant **L** was computed (see 5.1) with a total of 7000 workers.

Regarding the head width data in Table 4, there was a certain bias in the selection of samples because very populous **pht P^P** and **pht I^P** nests with small workers where polygyny was not in question and **pht R^M** nests with very large workers where monogyny was doubtless were frequently not investigated for their head width distribution (see 5.1.). Thus the **HW** of **pht P^P** (1576 μm) and **pht I^P** (1646 μm) are probably a little larger and those of **pht R^M** (1817 μm) somewhat smaller than in case of unbiased sample selection. The **HW** of phenotypes **P^P**, **I^P** and **R^P** are very similar but the mean of **pht P^P** is significantly ($p < 0.05$) smaller than the means of **I^P** and **R^P** which is doubtless a function of the much larger average population size in **pht P^P**. In polygyneous nests, a growing population size is expected to be correlated with a decreasing worker/queen ratio and thus correlated with decreasing food supply of worker larvae, particulary with a shortage of growth-stimulating secretions of labial and maxillary glands (see OTTO 1962, LANGE 1954). In monogyneous nests, a growing population size means selfevidently an increasing worker/queen ratio and consequently the above theory will predict an increase of average worker size. The following regressions show in fact for monogyneous nests positive and for polygyneous nest negative correlations between population size **A** and mean head width **HW**. For **pht P^P** was calculated

$$HW = 1640\ e^{-0.000469\ A} \qquad (r = -0.8794,\ n = 15,\ p < 0.001).$$