were preferred by *polyctena* workers. What GÖSSWALD understood as "Form II" is not sure because he gave only diffuse verbal descriptions on morphology which were as vague as his morphological descriptions of his "Mittlere Rote Waldameise" *Formica rufa rufopratensis major* GÖSSWALD, 1941 of which we have no types. However, from the complex life picture outlined by GÖSSWALD it is very probable that "Form II", the "Mittlere Rote Waldameise" and the intermediate **pht I** in my designation refer to the same morpho-ecological entity.

My investigations on material from the Soviet Union are not considerd here but one striking example for a phenotype shift should be mentioned. Near Svenigorod, 50 km W of Moscow, Dr. G. DLUSSKY showed me two proximate, good-sized wood ant mounds. The one nest (sample No 167) was a clear **pht I^P** nest (H_{cor} = 22.6) and the other nest (sample No 168) a clear **pht P^P** nest (H_{cor} = 6.2). According to DLUSSKY's long-term observations, the **pht I^P** nest was a daughter nest of the **pht P^P** nest. As in the Spitzberg colony, a possible explanation could be that the daughter nest had repeatedly accepted queens of hairier phenotypes which displaced the **pht P** queens. I recorded 5 **pht P**, 8 **pht I** and 2 **pht R** nests at the site Svenigorod which makes such an interpretation plausible. The Spitzberg and the Svenigorod case suggest that we probably have something like a "multiple social parasitism" of dominant hairier queens in less hairier host nests.

4. Morphological investigations on queens

A sufficiently safe phenotype determination of queens is not possible in single, isolated specimens but requires a nest sample because within-phenotype and within-nest variability is large. This refers particularly to microsculpture of scutellum and first gaster tergite which are unfortunately often quoted as key characters to separate *F. polyctena* and *F. rufa* (KUTTER 1977, COLLINGWOOD 1979). I found in **pht R** nests, among 56 studied queens, 7 (= 12 %) specimens which would have been determined as "clear" *polyctena* due to microsculpture and surface characters and, on the other hand, two queens among 23 **pht P** queens with "clear" *rufa* surface characters. The situation in **pht I** is still more heterogeneous and produces a lot of confusion. Further, such characters are difficult to quantify and it is often a matter of individual taste whether a surface is regarded as shining or dull, finely striate or smooth.

In pilosity characters we have significant differences of the means but again considerable overlap. The following table shows head width and pilosity data of first gaster sternite and is based on 34 nest samples with 145 queens. Only queens taken directly from the nests were incorporated to have a sufficiently safe phenotype determination:

	pht P (n = 56)		**pht I** (n = 57)		**pht R** (n = 71)	
	mean SD	range	mean SD	range	mean SD	range
HW	2013 ± 67	[1879, 2166]	2118 ± 66	[1944, 2317]	2140 ± 63	[2027, 2271]
pstl	189 ± 107	[24, 379]	307 ± 81	[27, 407]	375 ± 38	[180, 423]
astl	34 ± 10	[0, 62]	66 ± 49	[19, 274]	185 ± 76	[27, 302]
st	2.61 ± 2.00	[0, 6]	7.73 ± 4.84	[0, 25]	22.24 ± 7.78	[3, 41]

The large overlap ranges in the table above show queens are not easier to separate than workers. Comparably to the situation in workers, we may have nests with phenotype mixtures as for example in **pht R** nest No 26:

queen No	HW	pstl	astl	st
1	2229	388	209	24
2	2128	372	216	21
3	2113	180(!)	27(!)	3(!)
4	2182	316	268	19
5	2109	407	206	19