

# THE STORY OF THE PIED MUTATION

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Pied or splashed "variants" have been known and occasionally reported in doves for many years; for example, Finn, 1902 and Dr. Oscar Riddle, 1947. However, nothing came of them until about 1957, when Bernard Roer of Phoenix, Arizona, first bred some, and later started selling them. Here's what he has written about the origin:

"My pied Ringneck doves were first raised by Mr. Hugh Nichols, Higley, Arizona, from a pair of common Ringnecks that he got from me. They had about half pied young (male and female). These were mated together and raised only pied. At about this time pied birds were raised from Ringnecks by Lou Shoemaker in Baldwin Park, California. These birds looked like the ones we had. I sent a lot of my doves to California, so they have been mixed."

So, pied birds began to get around the country. By 1965 some had arrived in Richard E. Burger's aviaries, and he began publicizing them. He sent us a start in May, 1967, and more in 1969. He reported that his matings of pied birds together produced only pied, in agreement with Roer's statement. Also he wrote "I crossed pied to white, fawn, and salmon. All progeny were of more or less original fawn.... My mating of fawn X fawn (both from pied cross) have produced a white and a fawn." And "pied cock X fawn (crossbred) hen produced 8 young -- 4 pied and 4 fawns.... Nine young piers have been lost at various stages of development -- my only dove losses."

The white young from Dick Burger's  $F_1$  X  $F_1$  mating was simply the ordinary sex-linked white coming out, unrelated to pied. Anyway, we were satisfied that pied is not sex-linked, but a simple recessive mutant type. Over the years in the Iowa State University Genetics Laboratory much more data have been accumulated, as summarized in the following table. (Note that the birds are classified simply as pied or not-pied; any other color notation is ignored -- for example, a pied rosy is just as much a pied as a pied fawn or a pied dark. Whites cannot be classified however, and are therefore not included. Also, any squabs dying before plumage could be classified have been omitted.)

Cock	Mating Hen	No. of matings	Progeny		
			Pied	Not-pied	
Pied	Pied	20	153	0	
Pied	Non-pied	9	0	91	} total 194 $F_1$
Non-pied	Pied	9	0	103	
Pied	Non-pied $F_1$	9	61	59	} total 116 pied: 106 non-pied
Non-pied $F_1$	Pied	8	55	47	
$F_1$ non-pied	$F_1$ non-pied	16	39	115	

These results are quite adequate support for the conclusion that pied is a simple recessive mutant, not sex-linked. But -- pied doesn't look so simple, and breeders may easily be confused. Why does one pied bird look say three-quarters white, while another is only maybe one quarter white? Shouldn't they be put into different classes?

The breeding evidence says that all pied birds are homozygous (pure) for the recessive mutant and can be symbolized  $pi/pi$ . But they may differ in regard to other factors, for example rosy, and possibly there are some "modifying genes" that affect the expression of the pied. We can only guess at present. Dick Burger has been trying for years to select different patterns, to fix a "baldhead" and a "tail-marked", but the response has been poor. The tendency seems strong for haphazard splashing.

In juvenile plumage the young pied doves don't look pied -- they show a grizzled appearance. Then as they molt, some feathers come in completely white, others completely pigmented. Is there some mysterious internal coin-toss to decide "to be or not to be" white? The fact that the birds tend to show a fair amount of symmetry in pattern suggests to us that the decision may depend on ups and downs of metabolism or hormones, but just what, we can't put our finger on yet. Experiments should be tried with thyroid hormone or cortisone, for example, to see whether a shift could be induced.

And when we scrutinize the piers, some other interesting details may be noted. The babies typically have clear (non-pigmented) beak. Often the baby down seems richer yellow than ordinary. The adult eyes are typically dark ("bull"), lacking the orange iris color so that we see the black inside the eye. And further, the non-white tail feathers show a pronounced "rusty" tone not seen in normal doves.

We said that white doves can't be classified as pied or not-pied, but actually we can classify adult whites -- with pied the result is "black-eyed white". Pied ivory is probably another difficult combination to classify in juveniles; Dick Burger tried to get it and failed, but we have one now.

There is one further little problem: a few of the  $F_1$  birds (maybe up to 10%) show one or more white feathers, usually in the head region. We are reasonably certain that these birds cannot be homozygous piers. White feathers can develop after local injury, but another possible explanation for them here may be that the pied factor is sometimes not completely recessive.

Still a lot to learn about the pied problems, so jot down your own observations for Newsletter readers!

#### References

- Burger, R. E.: correspondence 1966 - 1977; also Pigeon Genetics News Letter 1967 No. 43 page 10; 1968 No. 45 page 18; 1969 No. 49 page 74.  
1971 Amer. Pigeon Journal, July page 348.  
1974 Amer. Cage Bird Magazine, November page 25.  
1977 Pigeon Science & Genetics Newsletter No. 6 page 40.
- Finn, F. 1902 Journal of the Asiatic Society of Bengal, pages 162, 167.
- Miller, W. J. 1977 Amer. Dove Assoc. Newsletter, January.
- Riddle, O. 1947 Endocrines and Constitution in Doves and Pigeons. Carnegie Institution of Washington Publication 572, page 15.
- Roer, B. 1969 Pigeon Genetics News Letter No. 49 page 74.