App. IX

Bird Hazards to Aircraft Committee

Progress report on research into Amino Acid composition of birds

Submitted by CN LaHam, Ph.D.

The method employed for the preparation of the sample and the analysis has been published previously in Field note 43 by the Bird Hazards to Aircraft Committee. The only difference being that in this case entire birds were homogenized to prepare the sample and two analyses made for each sample.

The results are of a preliminary nature due to the difficulty which was encountered in obtaining birds of different species and in sufficient numbers to provide a large enough sample. This problem has now been largely overcome and in a few months we should be able to present results of a more conclusive nature.

In the case of the chicken and the pigeon ten birds of each were sampled. The results do not indicate any outstanding differences between the two. In fact they are impressive by their similarity. There is a higher percentage of glycine compared to the total amino acid content in the chicken than any other amino acid and this is not true for the pigeon; however, statistically this is probably not significant.

With these two exceptions the other analyses are based on one or two bird samples and therefore can only be suggestive of what might be definite differences.

The Snowy Owl and the white owl are actually the same species but one was immature. The only difference between the two is in the amount of glutamic acid present. Both have high peaks for alanine and lysine while the relationship of the other amino acids is the same.

The American Scoter analysis (one sample) is more closely related to the Snowy Owl than to any of the other types analized, however, the relationships of the amino acids show some differences; for example, there appears to be proportionally more lucine than alanine in the American Scopter whereas the opposite is the case for the Snowy Owl.

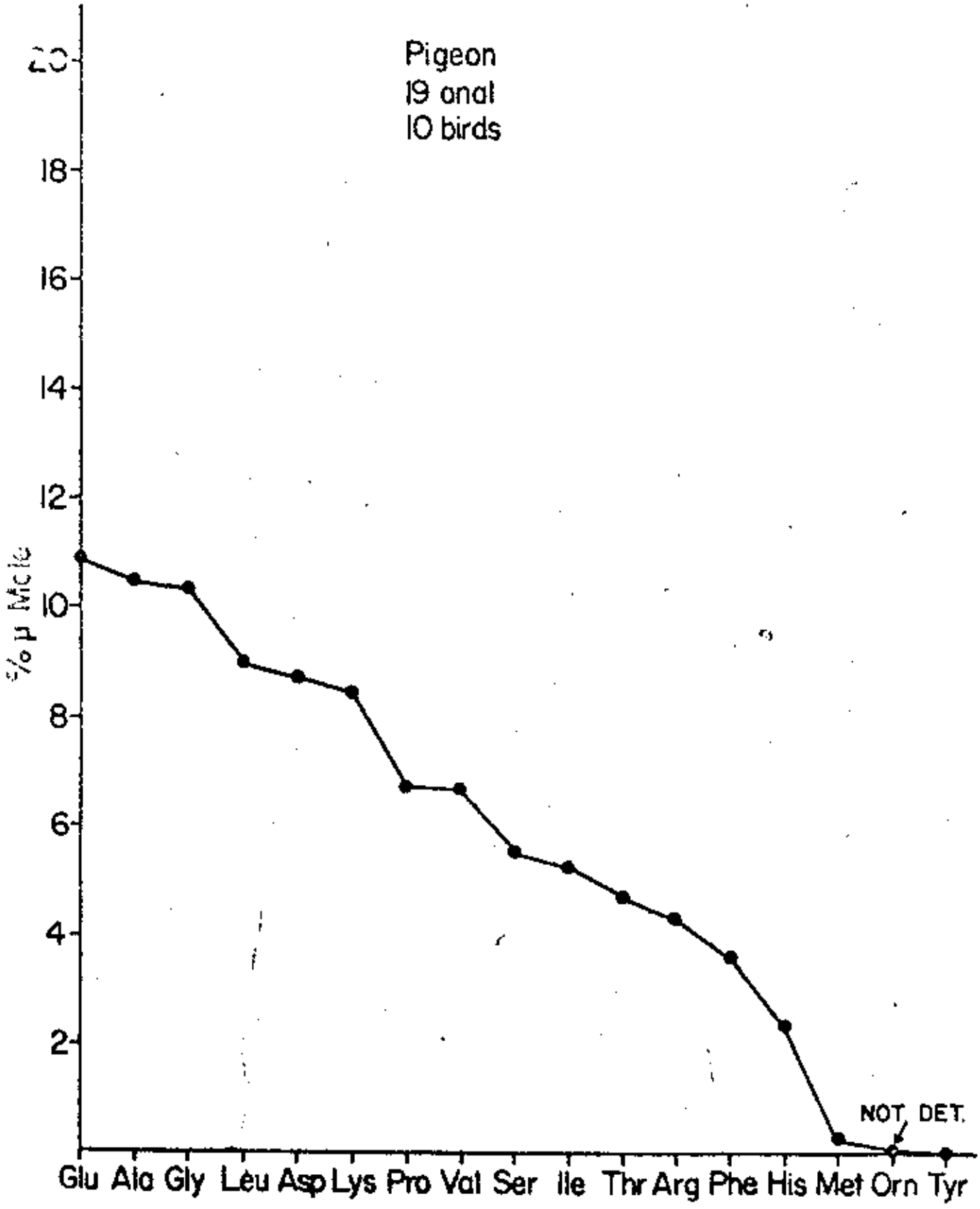
The Mallard Duck (1 sample) and the Pheasant (1 sample) present an amino acid profile of great similarity showing only minor percentage variations which probably would not be significant. They are, however, different from the others. It seems rather difficult to reconcile these facts when one would expect marked differences between two such widely different species.

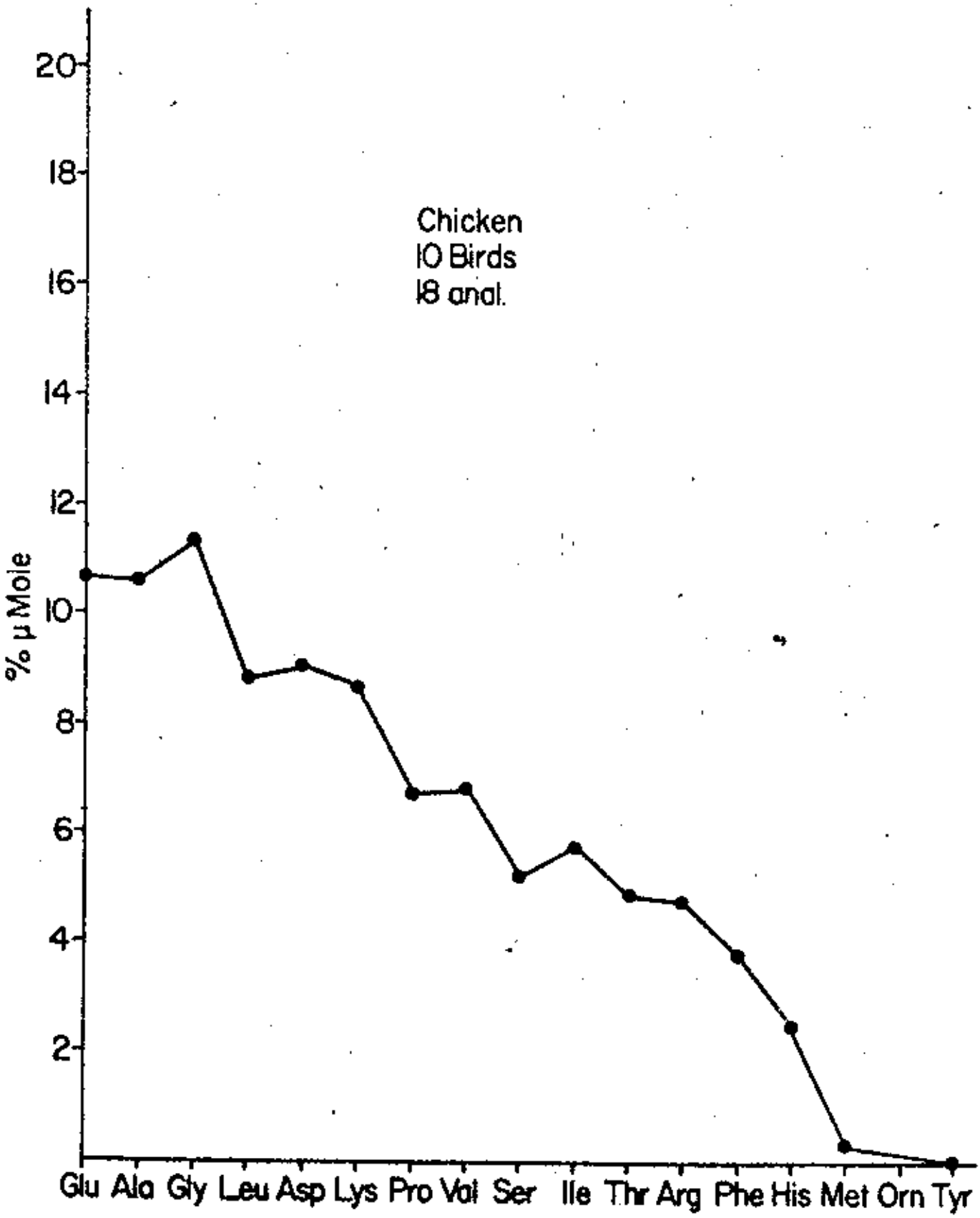
The profile of the Red Breasted Merganser shows a very high alanine content and a proportionally high content of glycine whereas lysine appears somewhat lower . Comparison of the individual amino acid values could well be significant.

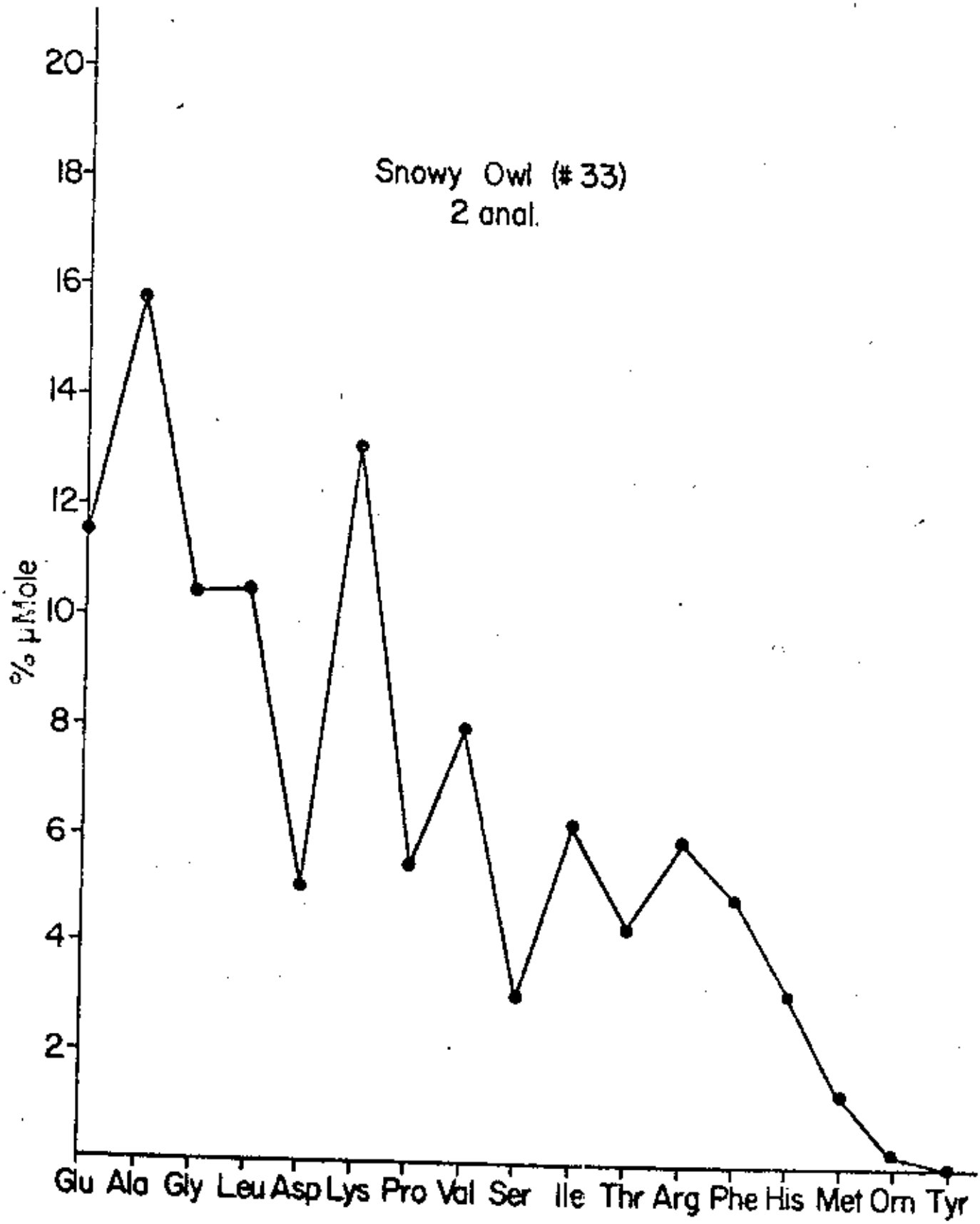
Finally the Purple Finch (one sample) is very different from all the others and gives a unique amino acid profile. It is the only one to have glycine in greatest abundance and the only one to show so little variation between lysine, proline and valine. If we could get

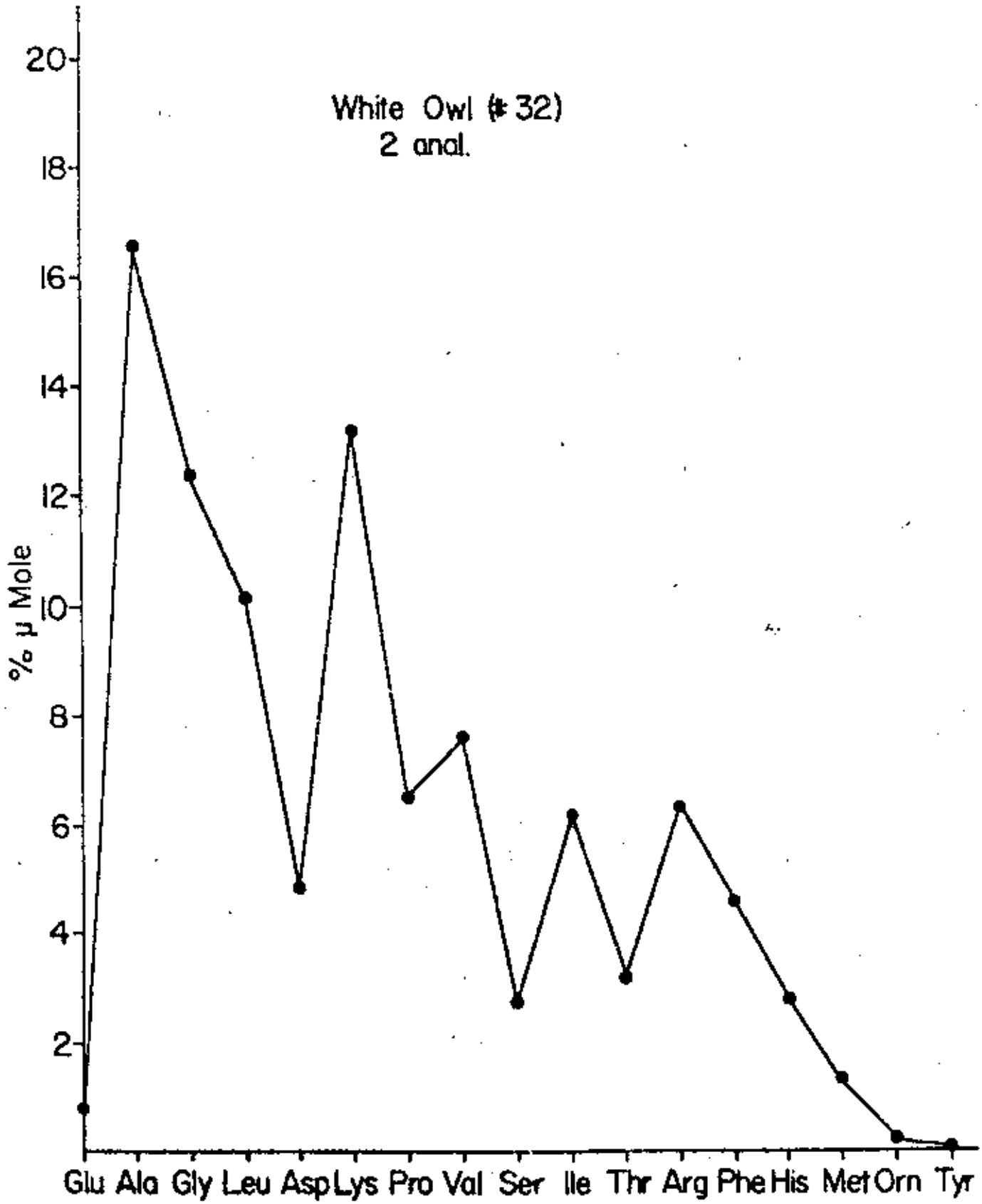
such a clear difference in all the samples the solution to the problem would be much simpler.

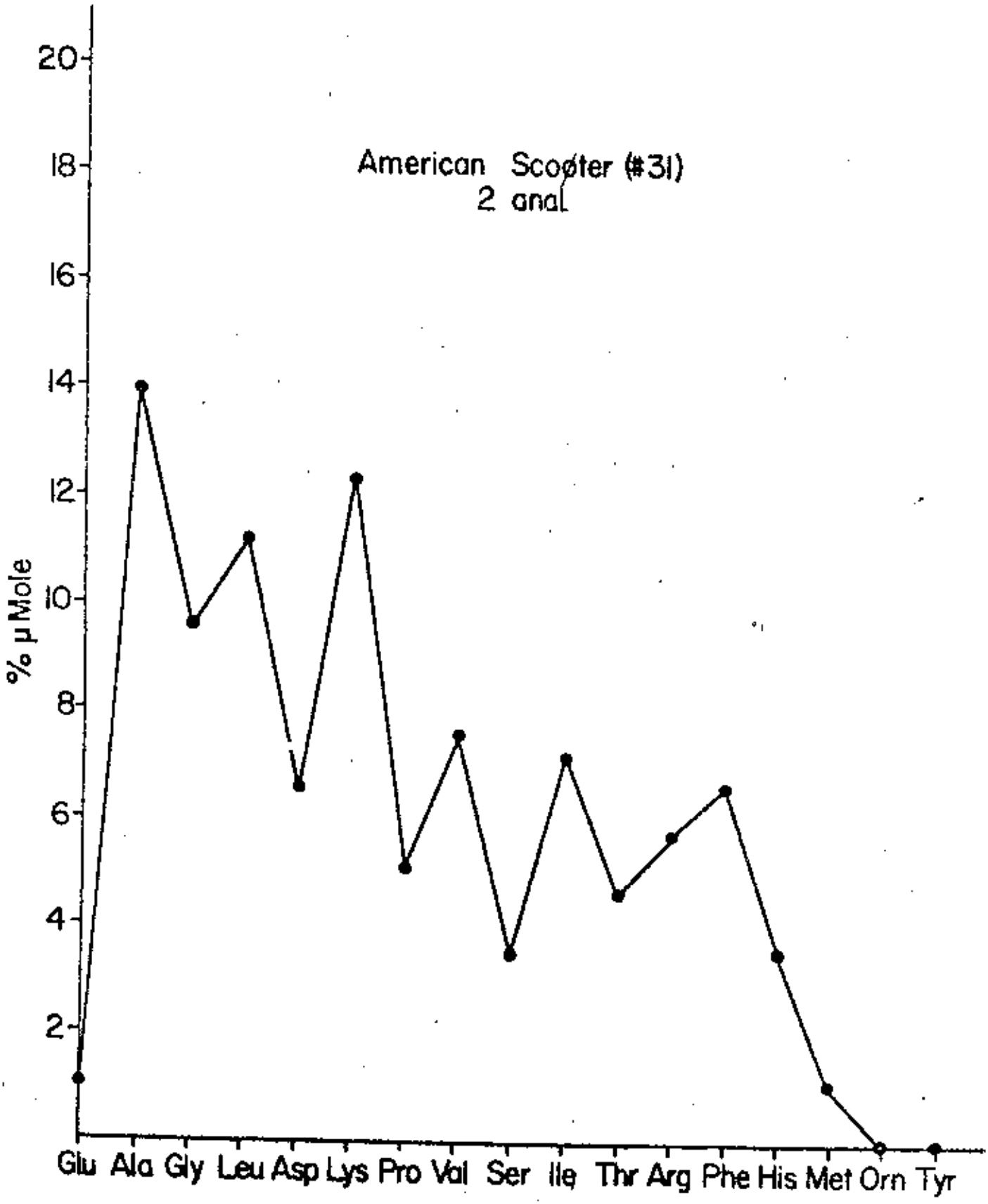
We can only conclude from what we have seen that we need a larger sample of more bird types. To draw any conclusions from the evidence at hand would be premature. The analyses should continue until such time as sufficient analyses have been made to draw sound conclusions.

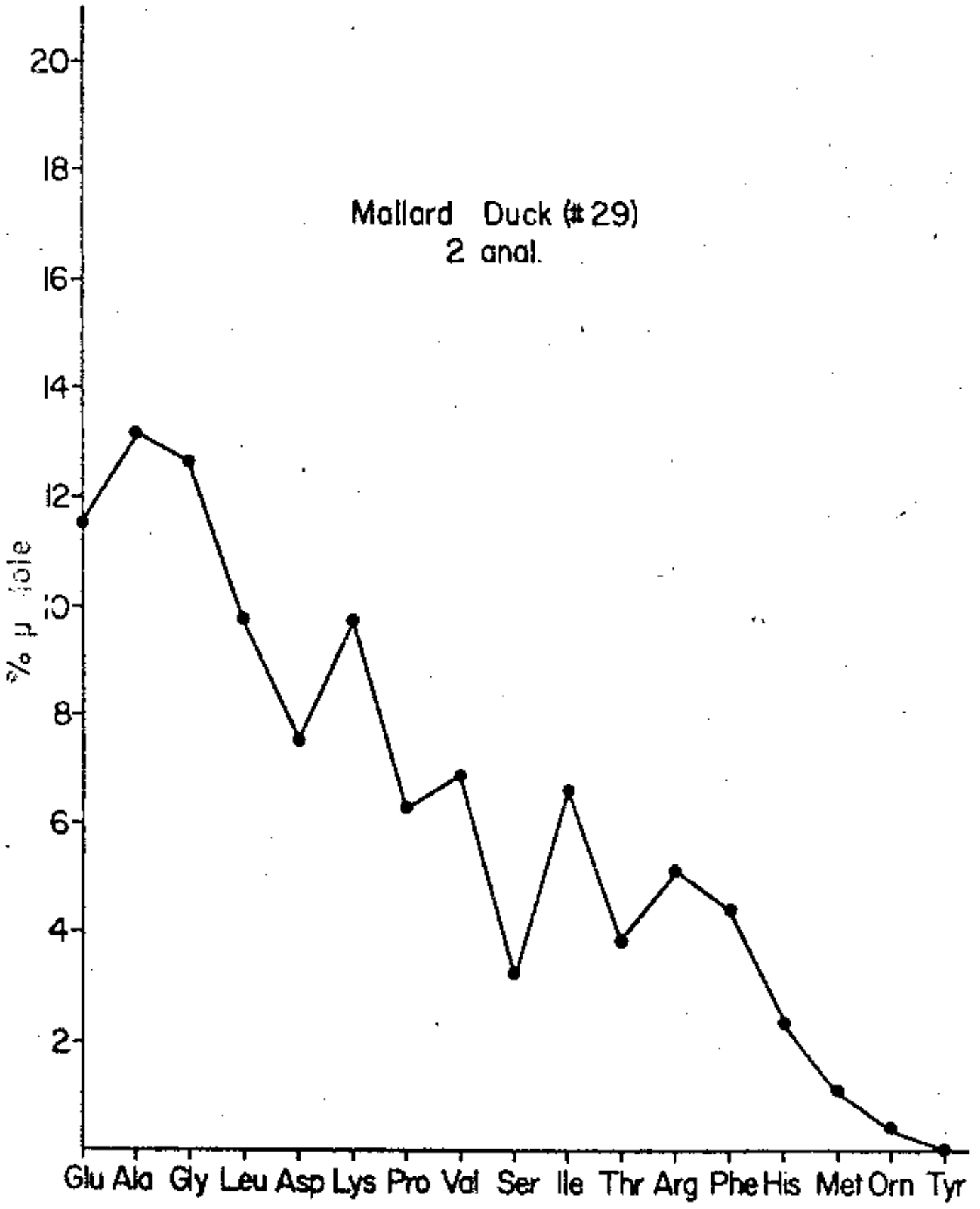

Pigeon
19 anal
10 birds
20
18
16
14
12
10
8
6
4
2
% μ Mole
NOT DET.
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr

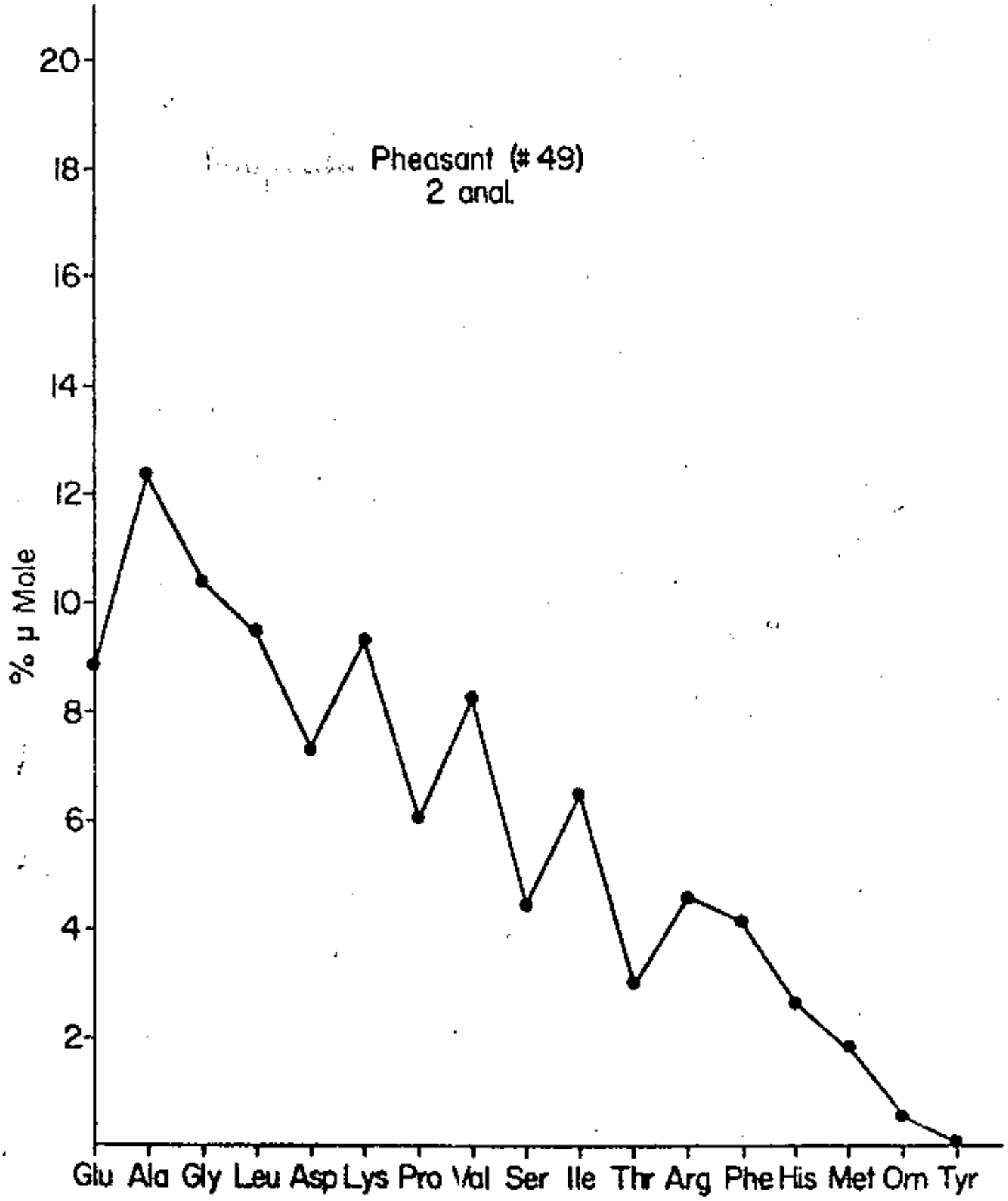

Chicken
10 Birds
18 anal.
% µ Mole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr

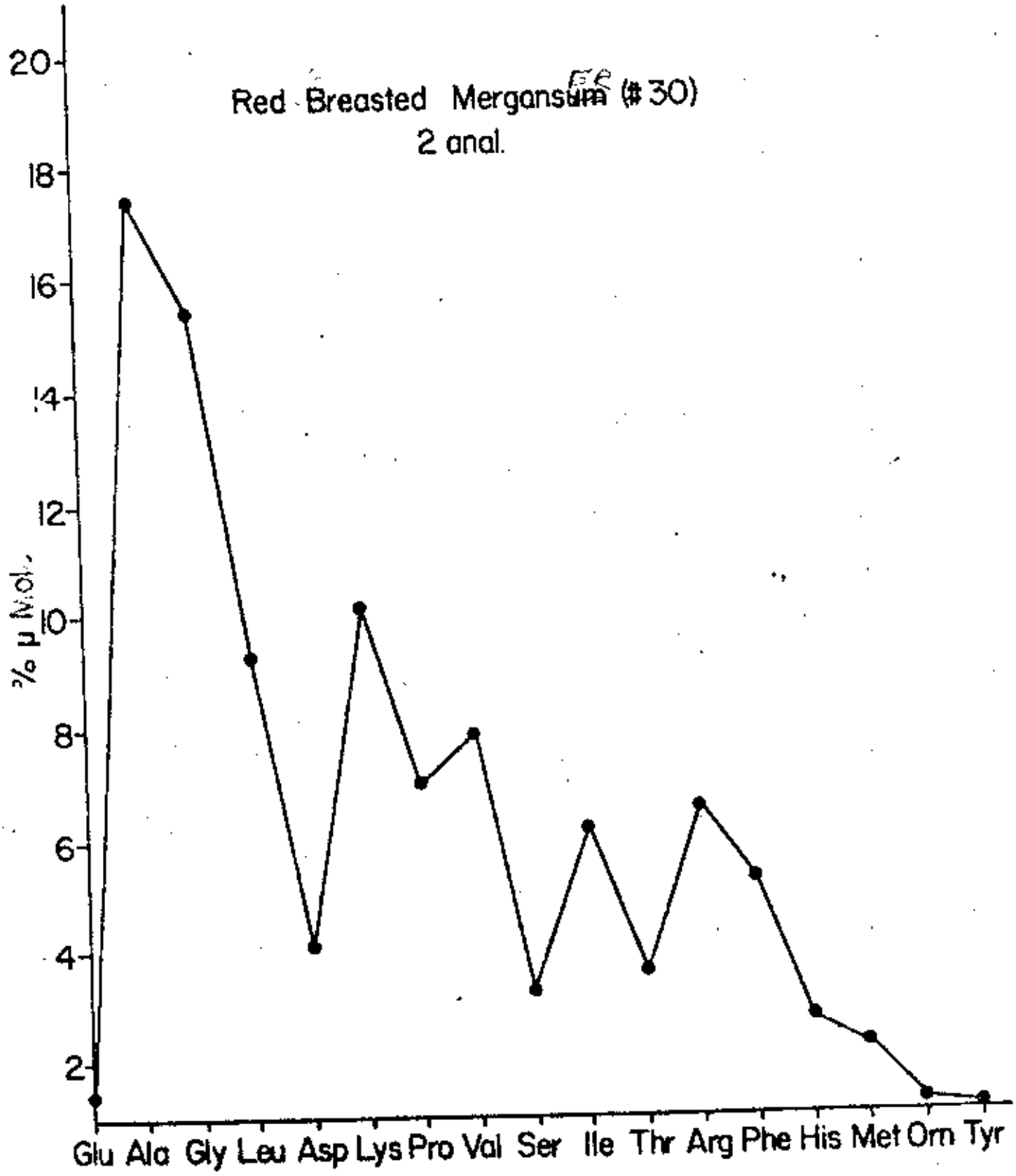

Snowy Owl (# 33)
2 anal.
% µMole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr

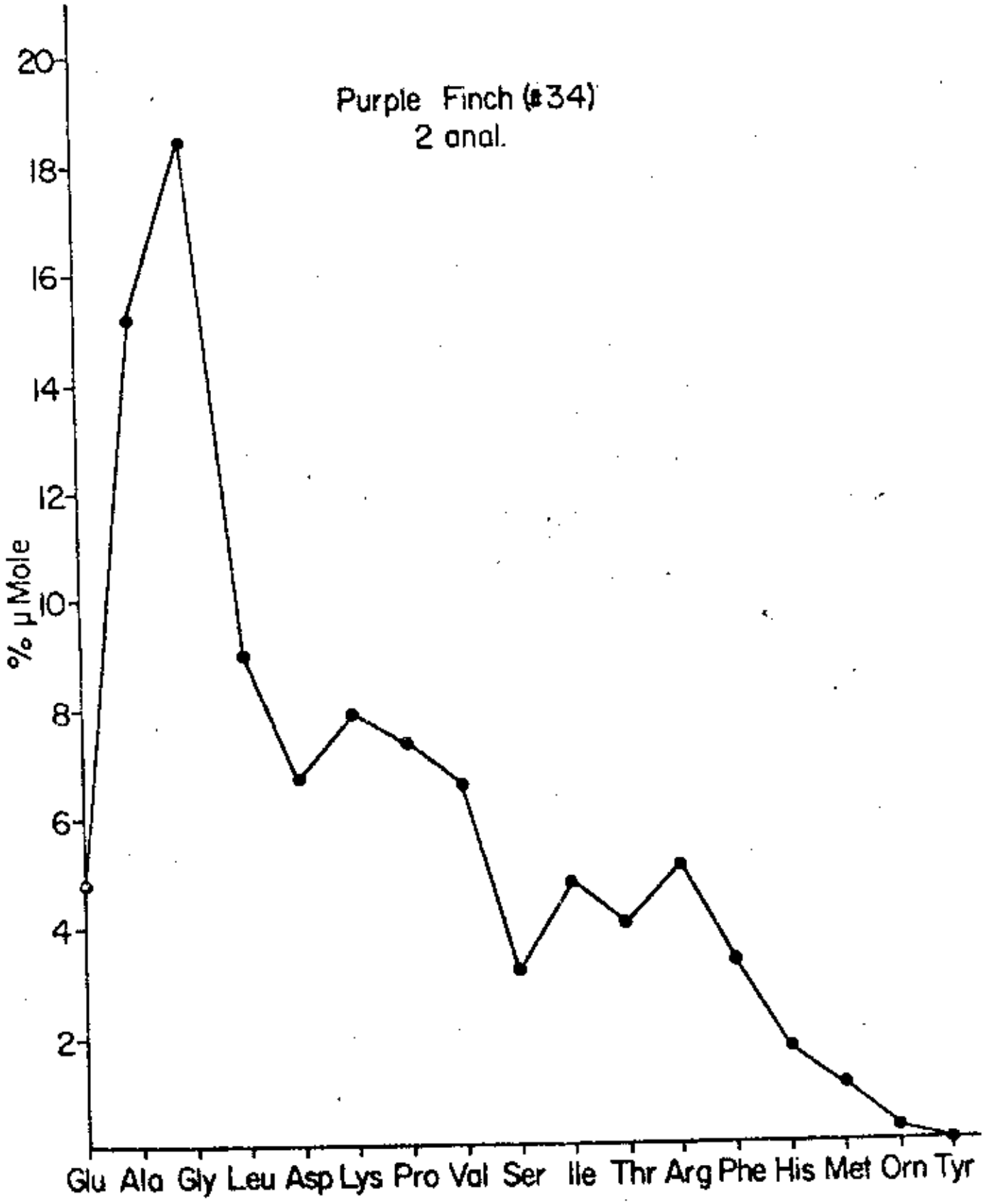

White Owl (# 32)
2 anal.
% μ Mole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr


American Scoøter (#31)
2 anal
% µMole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr


Mallard Duck (#29)
2 anal.
% μ Mole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr


Pheasant (#49)
2 anal.
% μ Mole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr


Red Breasted Merganser (#30)
2 anal.
% μ Mol.
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr


Purple Finch (#34)
2 anal.
% μ Mole
20
18
16
14
12
10
8
6
4
2
Glu Ala Gly Leu Asp Lys Pro Val Ser Ile Thr Arg Phe His Met Orn Tyr