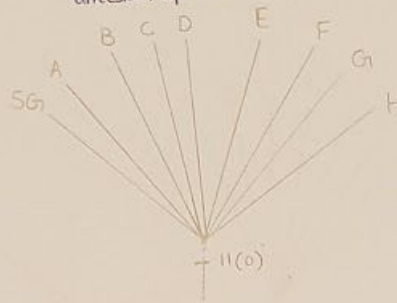


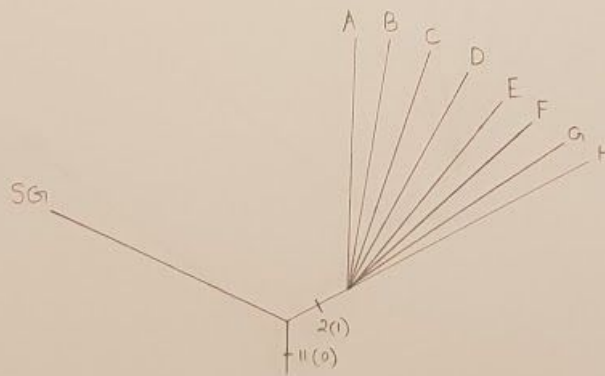
Cladogram 1.

No resolution.
All species have the notochord (11)
and it is a character possessed by the
ancestral species.



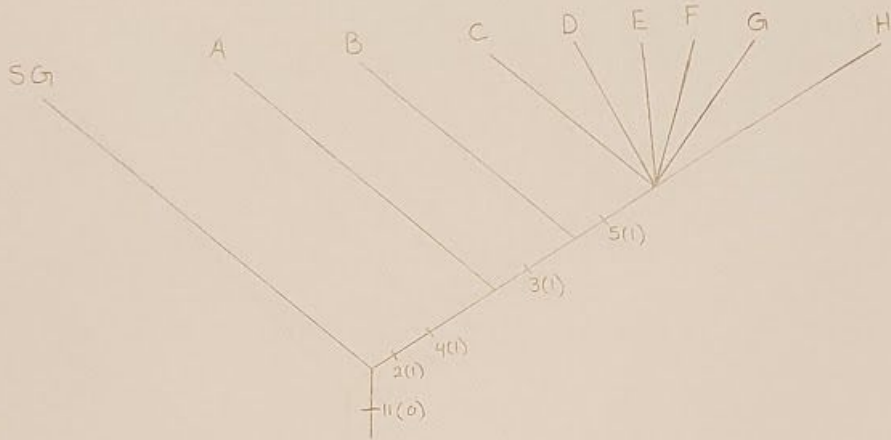
Cladogram 2.

Jaws added. (2)



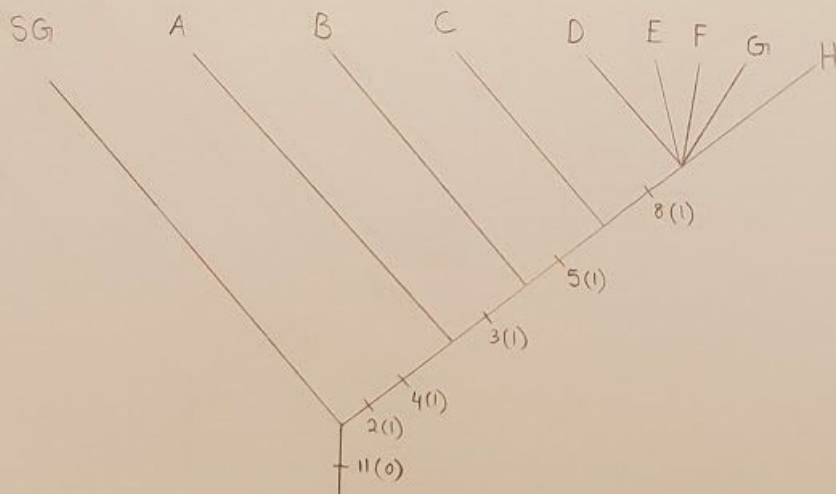
Cladogram 5

Characteristic added: Paired limbs w/ tarsi & carpi. (5)

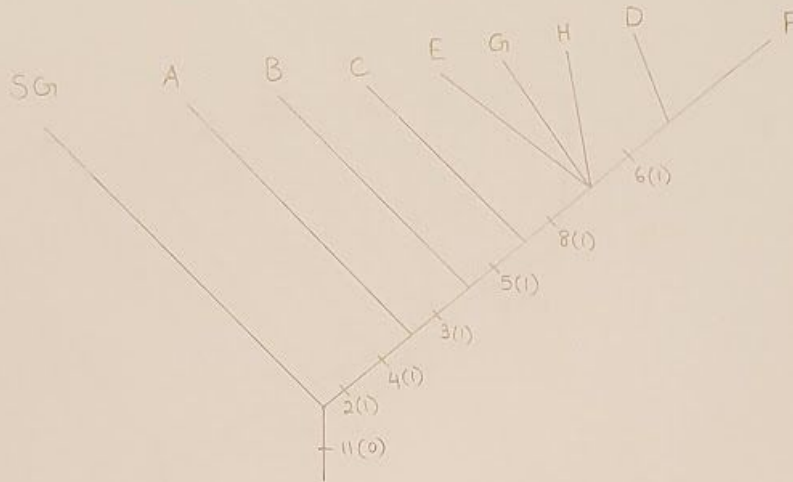


Cladogram 6

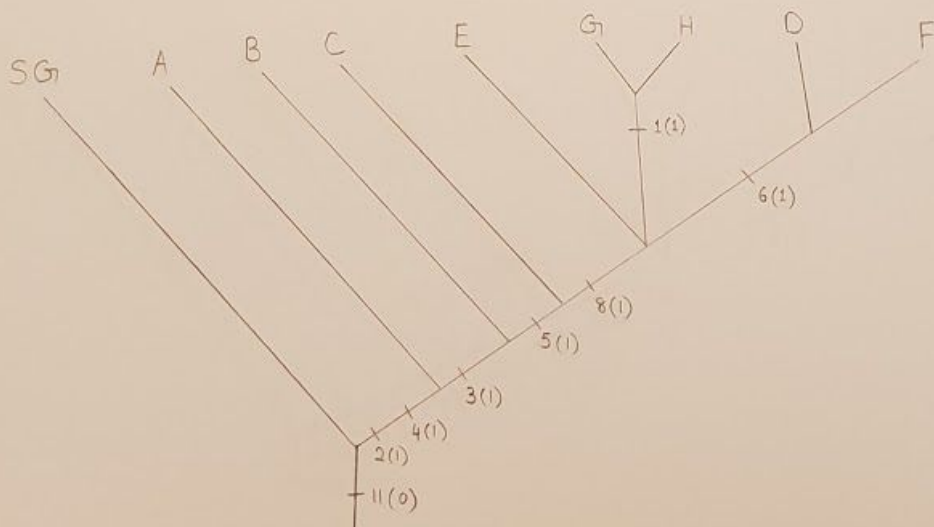
Characteristic added: Amnion. (8)



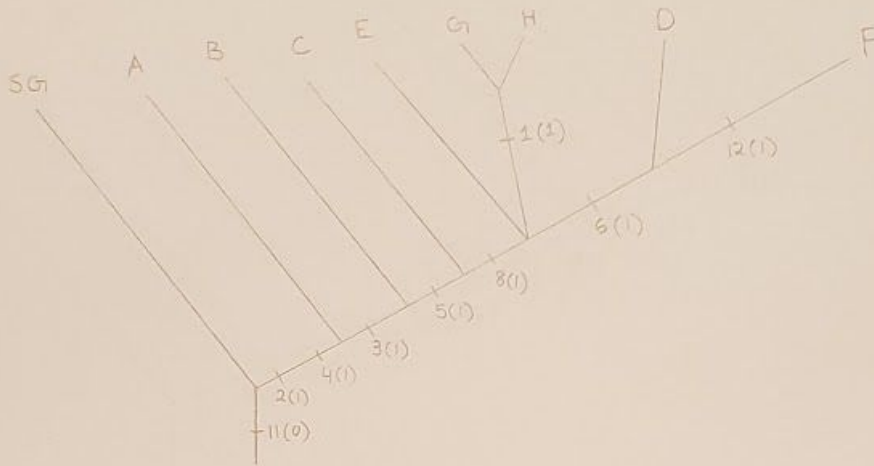
Cladogram 7
 Characteristic added: Gizzard (6)



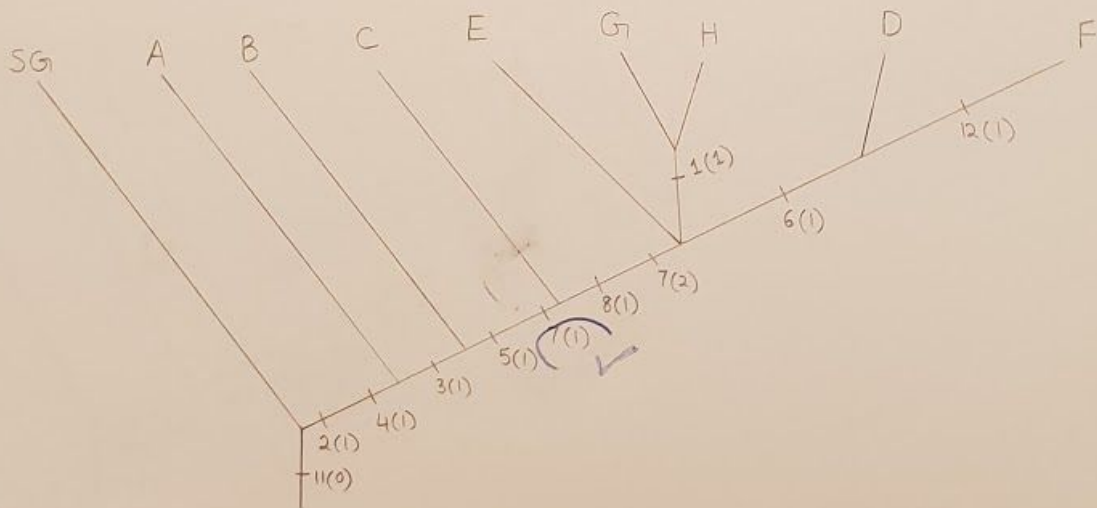
Cladogram 8
 Characteristic added: Hair of Fur. (1)



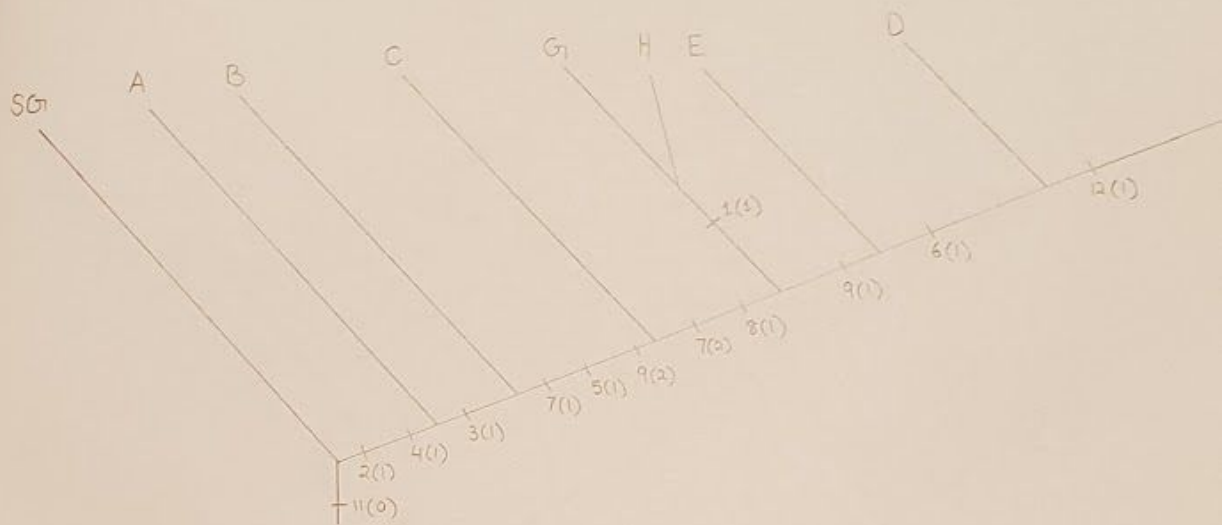
Cladogram 9
 Characteristic added: Forelimbs modified for flight.
 (12)



Cladogram 10
 Characteristic added: Sacral Vertebrae
 (7)



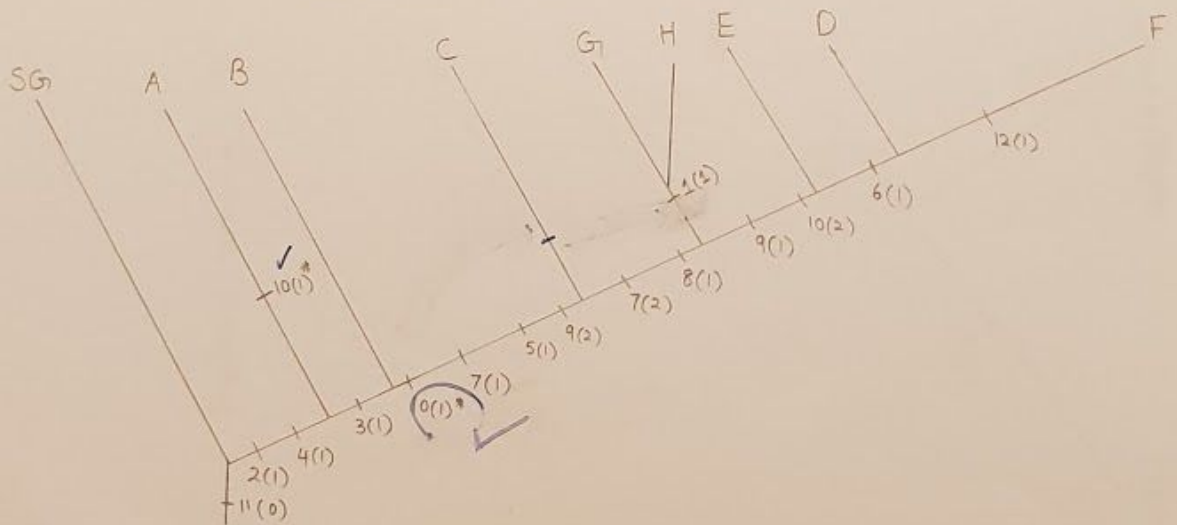
Cladogram 11
 Characteristic added: Occipital Condyles.
 (9)



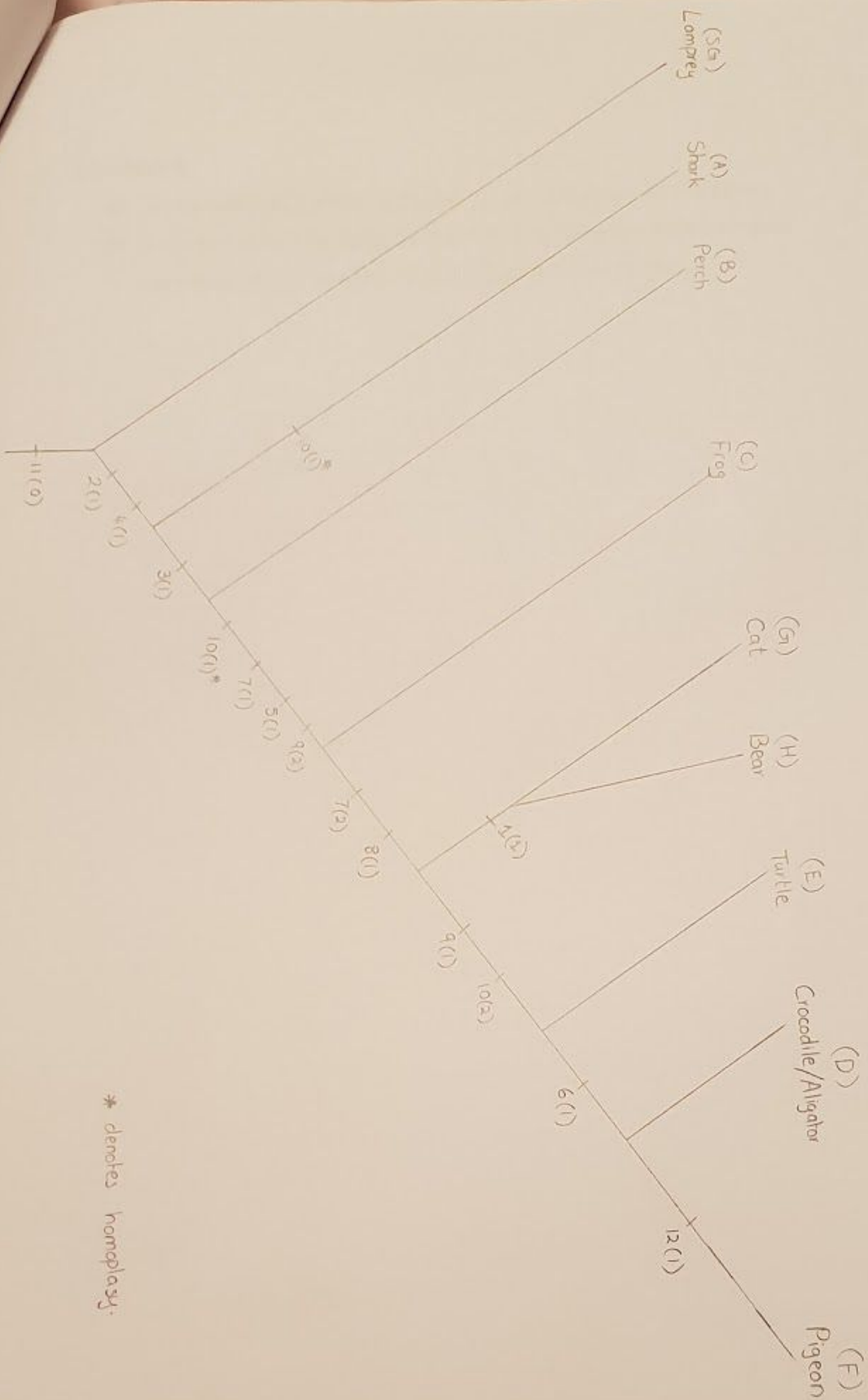
Cladogram 12

Characteristic added: Nitrogenous wastes. (10)

This character is a homoplasy. Too many characters would become ~~homo~~ homoplasies if [ACGH] formed a monophyletic group and so this is the most parsimonious theory. It is a convergence type homoplasy where it evolved independently twice in the ingroup. 'It' refers to nitrogenous waste being in the form of urea.



Final Cladogram



* denotes homoplasy.

Conclusion:

- a) The endothermic species in the cladogram are pigeons, cats and bears.
- b) According to the cladogram drawn, endothermy represents **convergent homoplasy** as this would be the most parsimonious theory.

Matrix mark (see printout):

12 / 12

Matrix late penalty (-10% / day):

No matrix in report (-50% = 6pts):

Character #	1	2	3	4	5	6	7	8	9	10	11	12	
Cladogram	1	1	1	1	1	1	2	1	2	2	1	1	15 / 15
Comment (0.25)	.25												3 / 3

Report penalties:

- No title page (-1):
- Presentation (up to -15%):
- Late submission (report) -10% per day:

Matrix mark 12 / 12

great!

TOTAL LAB4: 33 / 33

Final cladogram	3	3
Endothermy conclusion	1	1
Report penalties	2	2

