4.9. Names and Syllogistic Deduction

1. Proper Names. Finally, note that the following sort of argument is sometimes given as an example of the categorical syllogism.

1. All men are mammals.
2. Socrates is a man.

∴ Socrates is a mammal.

Neither the second premise nor the conclusion is in categorical form, as currently understand. But we can once again extend categorical form, to include proper names. We will use lower-case letters to represent proper names – so that the above argument translates into (extended) categorical form as follows.

a: Socrates

G: man/men
H: mammal(s)

1. All men are mammals.	1. All G are H
2. Socrates is a man.	2. a is G
∴ Socrates is a mammal.	∴ a is H

And concerning names, we find the following argument intuitive (keeping in mind that by "some" we mean: at least one).

1. Socrates is a philosopher.	1. a is G
2. Socrates is a man.	2. a is H
∴ Some philosophers are men.	∴ Some G are H

We call any argument of this form an instance of **Name Existential** (**NE**).

The following intuitive argument is an instance of the rule NE (taking the same sentence, "Ga," twice over, as both premises of NE. (It is sometimes referred to as *Existential Introduction*.)

Socrates is a man.	1. a is G
∴ Some men are men. ("Something is a man," "Men exist".)	∴ Some G are G (1, NE)

We can extend the rule Linking to include names – this extended form also coming as a derived rule.

(Extended) Linking (L)

1. Socrates is a man. 2. All men are humans	1.All G are H 2. a is G
∴ Socrates is a human.	∴ a is H

1.	a is G	
2.	All G are H	
		Get: a is H
3.	a is non-H	AID
4.	All non-H are non-G	2, (Lim) Sw
5.	Some G are non-H	1, 3, NE
6.	Some G are non-G	4, 5, Lim L
7.	a is H	3, 6, ID

We can likewise derive the rule **Universal Elimination** ("All Elim").

Everything is a material object

∴ Socrates is a material object

All non-G are G.
("Everything is G.")

∴ a is G.

1.	All non-G are G	
		Get: a is G (ID)
2.	a is non-G	AID
3.	Some non-G are non-G	2, NE
4.	Some non-G are G	1, 3, Lim L
5.	Some G are non-G	4, S
6.	a is G	2, 5, ID

(Note that on Line 5, Switching, not Limited Switching, is needed. An alternative to appealing to full Switching here would be to allow a 'relaxed' version of the contradiction that closes an ID: if we accept Line 4 as a contradiction, we can close the ID with that line, skip Line 5, and avoid appealing to full Switching. Relaxing the format of the needed contradiction in this way is itself a strengthening of the ID system, since IDs allowing such a 'relaxed' contradiction can, e.g., show the validity of this argument using only Limited rules – something not possible for the ID system without 'relaxed' contradictions.)

It is trivial to show, from there, that the following argument form is also deducible.

1. Everything is a material object.
2. Socrates is a man.

∴ Some men are material objects.

1 All non-G are G
("Everything is G.")
2. a is H

∴ Some H are G.

1.	All non-G are G	
2.	a is H	
		~~Get~~: a is G (ID)
3.	a is non-G	AID
4.	Some non-G are non-G	3, NE
5.	Some non-G are G	1, 4, Lim L
6.	Some G are non-G	5, Sw
7.	a is G	2, 6, ID
8.	Some H are G	2, 7, NE

The following intuitively valid argument is likewise deducible.

1. All hawks are birds.
2. Socrates is not a bird.

∴ Socrates is not a hawk.

1.All G are H
2. a is non-H

∴ a is non-G.

1.	All G are H	
2.	a is non-H	
		Get: a is non-G (ID)
3.	a is G	AID
4.	Some G are non-H	2, 3, NE
5.	All non-H are non-G	1, Sw
6.	Some G are non-G	4, 5, L
7.	a is non-G	3, 6, ID

We close with some further deductive applications of these rules.

a: Rex

G: millionaire(s)
H: club member(s)
I: philosopher(s)

1. Only millionaires are club members.
2. No philosophers are millionaires.
3. Rex is a philosopher.

∴ Rex is not a club member.

1. All H are G
2. All I are non-G
3. a is I

∴ a is non-H

		Get: a is non-H (ID)
4.	a is H	AID
5.	a is G	1, 4, L
6.	a is non-G	2, 3, L
7.	Some G are non-G	5, 6, NE
8.	a is H	3, 7, ID

1. All non-G are G
2. a is H
3. All H are non-J

~~Get~~: Some G are non-J (ID)

4.	All G are J	AID
5.	a is non-J	2, 3, L
6.	All non-J are non-G	4, Sw
7.	a is non-G	5, 6, L
8.	a is G	1, 7, L
9.	Some G are non-G	7, 8, NE

10. Some G are non-J 2, 6, ID

Nothing is a unicorn

∴ No horses are unicorns

All G are non-G.
("Nothing is G.")

∴ All H are non-G.

1. All G are non-G

~~Get~~: All H are non-G (ID)

2.	Some H are G	AID
3.	Some G are H	2, Sw
4.	Some G are G	3, E
5.	Some G are non-G	1, 4, L

6. All H are non-G 2, 5, ID