5.9.1. Translation Problems: Universal Sentences

A. **Translate** each of the following into the formal language of Chapter Five.

1. If everything is material, then Berkeley was mistaken.
(**A**: Berkeley; **G**: is material; **H**: was mistaken)

2a. Every student can translate this sentence.
(**G**: is a student; **H**: can translate this sentence)

2b. Any student can translate this sentence.
(**G**: is a student; **H**: can translate this sentence)

3a. If every student can translate this sentence, then Rex can.
(**A**: Rex; **G**: is a student; **H**: can translate this sentence)

3b. If any student can translate this sentence, Rex can.
(**A**: Rex; **G**: is a student; **H**: can translate this sentence)

4. All and only the virtuous achieve happiness.
(**G**: is virtuous; **H**: achieve happiness)

5a. Not all clients are in the conference room.
(**G**: is a client; **H**: is in the conference room)

5b. No clients are in the conference room.
(**G**: is a client; **H**: is in the conference room)

6. Not all philosophers are empiricists, but William James is.
(**A**: William James; **G**: is a philosopher; **H**: is an empiricist)

8. If the police found both Rex and Jake, then all the club members are in custody.
(**A**: Rex; **B**: Jake; **G**: the police found; **H**: is a club member; **I**: is in custody)

9. Unless business improves, not all the employees will remain with the company.
(**P**: Business improves; **G**: is an employee; **H**: will remain with the company)

10. Either some gamblers are cheating or none of the slot machines are working properly.
(**G**: is a gambler; **H**: is cheating; **I**: is a slot machine; **J**: is working properly)

B. Each of the following argument should seem intuitively valid or intuitively invalid. **Translate** each argument into the formal language, and then **try to construct** a model that's **a validity counterexample** for that argument, or else to explain why there couldn't be a validity counterexample for that argument.

(1) 1. All hawks are carnivorous.
2. There are no carnivorous rabbits.

∴ No hawks are rabbits.

(2) 1. No mammals are lizards.
2. All mammals have teeth.

∴ No lizards have teeth.

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

∴ Rex is not a club member.

(4) 1. Only millionaires are club members.
2. Some club members are not market analysts.

∴ Some millionaires are not market analysts.