# LOGICAL AND SEMANTIC PARADOXES

1. The Liar Paradox
   Peter says, "I am lying." If he is lying, then what he says is false, and so he is not lying. If he is not lying, then what he says is true, and so he is lying.

2. The Cretan Paradox
   The Cretan philosopher Epimenides said, "All Cretans are liars." If what he said is true, then, since Epimenides is a Cretan, what he said is false. - This can not go the other way round: If what he said is false, then some Cretans are not liars, but we don't know, if Epimenides is one of them.

3. The sophist Protagoras
   Protagoras made the agreement with one of his students, that this young man should pay for his education only if he won his first trial. The student finished his studying and waited for clients to come, but nobody showed up. Protagoras got impatient and sued his student to get his education-fee. Then what did happen?

4. The Barber Paradox
   The barber in the little town declared, "I'm shaving all men in this town, who is not shaving themselves." Now, do the barber shave himself or not?

5. Librarian Paradox
   Suppose a librarian compiles, for inclusion in his library, two bibliographies,
   A: of all those bibliographies in his library that do not list themselves,
   B: of all those bibliographies in his library that do list themselves,
   then which bibliography, A or B, should the bibliography A be included in?

6. Richard's Paradox
   All definitions about arithmetical properties of positive integers are being placed in serial order, for instance in alphabetic order, and they are numbered 1, 2, 3, ... It may turn out in certain cases that an integer will possess the very property designated by the definition numbered with that integer. Suppose, for instance, the defining expression "not divisible by any integer other than 1 and itself" has the order number 17; but 17 itself has the property designated by that expression. On the other hand, suppose the defining expression "being the product of some integer by itself" has the order number 15; 15 does not have this property. We now define:
   "An integer x is 'Richardian' if x does not have the property designated by the defining expression which has the order number x".
   In the examples 15 is Richardian and 17 is not Richardian. The definition of being Richardian must itself have an order number. Let us call this number n. Is n Richardian?