2. Transition to Falsificationism:

- Principle of Theory Priority
- Theory-ladenness

According to naive inductivism (positivism / neo-positivism), rigorous and bias-free observation is the solid foundation on which accurate or possible correct scientific knowledge can be derived. As seen before,

a) All cases will be observed and recorded irrespective of their significance and without a subjective preference or a priori prediction.

b) The observed and recorded cases will be analyzed, compared and classified without hypothesis.

c) From this analysis of cases, generalizations will be reached according to the classifier or causal relationships between them.

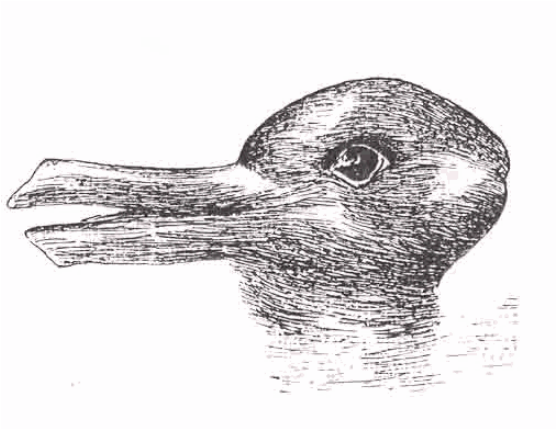
d) Subsequent research will be both deductive and inductive; because additional research will draw from the generalizations that have been determined previously.

So the basic assumptions are:

1. Science begins with observation.

2. Observation is the safe foundation from which scientific knowledge is derived.

3. Because the facts are the given realm. The most important proof of this is that two 'normal' observers who see the same phenomenon / object from the same place see the same thing.



Observation proposition 1: What is in the figure is a duck.

Observation proposition 2: What is shown in the figure is a rabbit.

What the observer sees, that is, when he looks at an object, the observer's vision experience depends in part on his past experience, knowledge and expectations. When it comes to science, it depends on the hypothesis / theory.

From this argument, it is not concluded that the propositions of observation play no role in science. Theory / hypothesis guides experiment / observation. Hypotheses / theories were designed before the observations required for their testing, albeit at the embryonic level.

Once a theory / hypothesis has been reached, it does not matter how it is reached anymore, the problem in terms of science is the adequacy of this hypothesis / theory.

Scientific Theories carry two contexts:

a) Context of Discovery

b) Context of justification

As long as stage (b) / context is based on induction on 'verification', it has to face all the problems of induction.

Introduction to Falsificationism:

The quality that makes theories / hypotheses scientific is that they are testable. However, testability is based not on verifiability as positivism / neo-positivism suggests, but on falsifiability. Popper's conclusion from the history of science and epistemology is that "we can also learn from our mistakes", "it is possible to approach reality" and yet "certain information cannot be reached". According to him, “our knowledge is a critical puzzle; a network of assumptions; it is a fabric woven from assumptions. ” The development of knowledge based on criticism and its basing on auditable assumptions or beliefs can be considered as a generally accepted determination by all the philosophy of science trends at first glance. However, what Popper understands from criticism and knowledge based on "assumptions" is very different from neo-positivism. According to Popper, the task of the scientist is to put forward propositions or a series of propositions (theory) and systematically test them. Thus, Popper first begins to search for the logical analysis of the scientific research method by affirming the idea of 'priority of theory'. Stating that theories are preceded by experiments as well as observations, which are important because of their relevance to theoretical problems, Popper states that when using the terminology of the trial and error method, the theory should come before the error as

an experiment. According to Popper, theory is the network that we cast in order to surround, rationalize, explain and dominate the 'world'. We constantly try to narrow the mesh width of this network.

Hypotheses are theoretical assumptions or predictions that are freely created to overcome the problems faced by previous theories and to give a deeper explanation of the world / nature. These assumptions must be tested in a 'brutal' and 'merciless' way by observation and experimentation.

Hypotheses / theories do not create facts. They guide the experience by shaping the observations / experiments that reveal them. Because they did not create the facts, they are still testable to them by reference. Hypotheses / theories that cannot pass this test are eliminated and more successful assumptions are replaced.

Science proceeds with trial and error, assumptions and falsifications. Only the strongest theories (those that can come out of the most brutal tests without being wrong) remain. While their truthfulness cannot be precisely asserted, it can be claimed that they are stronger and not yet falsified.

A white swan was observed at time X at time t.

A white swan was observed at position X in time t2.

A white swan was observed at time X in time tn.

A white swan was observed in the Y position at the time of tn.

Result: All swans are white.

As can be seen before, this inductive reasoning cannot guarantee the result.

WHEREAS

A non-white swan was observed at position x at time t.

Conclusion: Not all swans are white.

It guarantees the result of a single observation proposition.

Examples:

a) If the two bodies weighing 10kg and 1kg can be detected by an observation in the test experiment, where they move downwards at the same speed as the free fall, the thesis that the bodies fall at speeds proportional to their weights is falsified.

b) If a ray of light passing near the Sun deviates in a curved path, it can be proved without any doubt (if it can be observed), then the thesis that the light is necessarily moving in the correct lines is falsified.

FALSEABILITY: A hypothesis is falsifiable if there is only one possible observation proposition or set of observation propositions in terms of the logic that goes against it. That is, if the observation proposition or set of observation propositions is established correctly, the hypothesis is falsified.

Forms of proposition that do not meet the falsification requirement:

a) It is either raining or not.

b) All points on an Euclidean circle are equidistant from the center.

c) Your chances of winning in chance games today are 99%.

A scientific hypothesis / theory must be falsifiable. So a scientific hypothesis / theory should exclude some possible observational propositions.