UNIT 4 POPPERIAN METHOD AND NATURALIZED EPISTEMOLOGY

Contents

4.0 OBJECTIVES

Having dealt with the methods adopted by classical as well as modern thinkers in the last three units, we have also become aware that the foundationalist method of the moderns is highly problematic. And a purely coherentist method is not satisfactory either. In this unit we shall deal with two new developments, namely the idea of naturalized epistemology and the Hypothetico-Deductive method of Karl Popper. By the end of this unit, you will be familiar with:

- The basic idea of naturalized epistemology
- A preliminary understanding of the hypothetico-deductive (H-D) method
- The distinction between discovery and justification
- Some Implications of Naturalized Epistemology.

4.1 INTRODUCTION

Modern Western philosophy is beset with a paradox: the tremendous explosion of scientific knowledge on the one hand, and an unscientific approach to theory of knowledge, on the other. Their approach to theory of knowledge, if not unscientific in the sense of going against science, is unscientific at least in the sense that it was not based on what practicing scientists actually do in acquiring knowledge. Naturalized epistemology as well as the Popperian method can be seen as attempts to overcome this paradox of modern epistemology. Both seek to learn from the actual practice of scientists to see how knowledge –understood

as beliefs that have been justified or given reasons for believing to be true— is acquired and suggest that epistemology should be modelled on their practice. Let us see these in more detail.

4.2 THE CRISES OF MODERN EPISTEMOLOGY

The famous philosophical schools of empiricism as well as rationalism are good examples of philosophical reflection that neglects the actual process of coming to knowledge. The empiricists talk of knowledge through the senses and the rationalists proclaim knowledge through reason. But both fail to see that we have very little (if any) knowledge that actually comes to us either from the senses or from reason alone. Most of our knowledge is the result of joint working of the senses as well as reason. Ignoring this, they tried to build their foundationalist epistemologies.

Foundationalism, as we have seen in Unit 2 of this Block, was the attempt to rebuild the whole gigantic ship of our knowledge using only those limited number of beliefs that are absolutely certain, indubitable (i.e., that which cannot be doubted) and which will need no correction. In other words, the vast body of beliefs that we ordinarily take to be true was to be given a go-by until they were shown to be firmly built on these indubitable foundational beliefs. Foundationalism was an attempt to overcome the sceptical challenge to knowledge. Given that both the empiricists and rationalists were foundationalists who attempted to overcome scepticism, the main difference between them consisted in what each took to be foundational: for the one, sense experience was foundational and for the other undeniable truths of reason (like Descartes' *cogito*) were foundational. With the eventual realization that the whole edifice of our knowledge cannot be rebuilt from the beginning, that too on indubitable truths, disillusionment was bound to set in.

Disillusionment with foundationalism was not the only crisis faced by modern epistemology. There was also the sense that it was powerless even to carry out its main task of adjudicating cognitive disputes. Epistemology was seen by the modern thinkers in the role of a judge whose responsibility it was to pass judgements on candidates to truth. Instead, it was seen to engender disputes within its own ranks. For example, how does one adjudicate between empiricism and rationalism? The result of such disputes is that in spite of its professed goals, the fate of modern epistemology became like that of a village *panchayat* (originally set up to resolve the conflicts of others in the village) where the judges, instead of resolving the conflict, themselves come to blows. It is against these and other crises faced by modern epistemology that we must see the emergence of Naturalized Epistemology.

4.3 NATURALIZED EPISTEMOLOGY

One cannot discuss the naturalistic turn of contemporary epistemology without taking the name of W.V. Quine. His 1969 essay, "Epistemology Naturalized" is a landmark. This essay begins with the foundationalist attempts of the empiricists to re-build the ship of scientific knowledge on the firm foundations of sense experience. Given that we are sure of our sense experience, if all other knowledge could be derived from these experiences, then the sceptic would be put in his place. This was the hope. Quine argues that all attempts at rebuilding the body of scientific knowledge in this manner have failed. Given this failure of traditional epistemology, Quine suggests that such attempts be given up. In place of such

epistemology we need to re-conceive epistemology in a new way. His suggestion is that in the new setting, epistemology be seen as an examination of how we come to have our understanding of the world from the sensory stimulations we receive. This is a factual question to be investigated by psychology and not a matter for armchair speculation. It is for this reason that he makes the bold claim that "Epistemology, or something like it, simply falls into place as a chapter of psychology and hence of natural science." A "conspicuous difference between old epistemology and the epistemological enterprise in this new psychological setting is that we can now make free use of empirical psychology," says Quine. Obviously such a view of epistemology goes against the view that epistemology provides the foundations for sciences. From this initial suggestion of Quine, naturalized epistemology has developed in various ways. But we will not discuss them all.

In saying that epistemology simply falls into a chapter of science, Quine would seem to be advocating that we bid farewell to traditional epistemology and replace it with psychology. This view is known as Replacement Naturalism. Replacement Naturalism, however, is beset with difficulties. The most important difficulty was perhaps pointed out by Hilary Putnam: it eliminates the normative or evaluative dimension of epistemology. Notions such as a belief being "justified", being "rationally acceptable" are fundamental to any theory of knowledge. What is important is to notice that these notions are unmistakably normative. Without such normative notions there cannot be any epistemology. The biggest problem with naturalized epistemology, according to Putnam, is that it tends to eliminate such normative notions and focuses exclusively on matters of fact, i.e., of how we come to have the beliefs we have. Without the normative, the notion of truth itself disappears since there is no way of arriving at true beliefs; without the notion of truth the notion of evidence disappears since there is nothing to distinguish "right" kind of evidence from others. For these and other reasons, replacement naturalism is not a popular view today. What is even more remarkable is that in spite of his recommendation to replace epistemology with a branch of natural science, not only has Quine himself never followed his own suggestion. He has always pursued normative investigations in his epistemological carrier. In his later writings, especially in *Pursuit of Truth*, Quine has toned down his earlier view of replacement naturalism.

A more modest and more popular form of naturalism is called Cooperative Naturalism. This view does not seek to replace epistemology with psychology. It holds that while evaluative questions are essential to epistemology, empirical results from sciences are important and useful for addressing evaluative questions. It holds that empirical findings concerning our psychological and biological limitations and abilities cannot fail to be relevant to the study of human knowledge. Moreover, it can be shown and has been argued that a purely *a priori* armchair approach to epistemology is more an aberration of modern philosophy than the norm. Aristotle and Aquinas, for example, begin their epistemology with a psychology of the human knower. In other words, attention to psychology needs to be seen as necessary for epistemology, not as replacing it. The basic difficulty with Cooperative naturalism seem to be that while it rightly acknowledges the role of psychological findings in the study of human knowledge, its relation to the traditionally important question of justification of knowledge or the relationship between belief and evidence remains unclear.

It is here that a broader understanding of naturalized epistemology is needed than the views regarding the role of psychology in human knowledge. Such a view can be found in James Maffie's survey article, "Recent Work on Naturalized Epistemology" (1990). Maffie identifies the distinguishing feature of naturalized epistemology to be the affirmation of continuity between science and epistemology. This is a broad characterization that lends itself to further elaborations. It could even be considered as a version of cooperative naturalism, although its concern is with sciences in general than only with psychology. Maffie discusses various kinds of continuity between sciences and epistemology. We shall limit our discussion to two such continuities: the methodological and the contextual. These can be seen as responses to the two crises we have mentioned: methodological continuity as a response to internal conflicts and contextual continuity as a response to the crisis of foundationalism.

4.4 METHODOLOGICAL CONTINUITY

Continuity of method between sciences and epistemology means that the methods of inquiry followed in the sciences and in epistemology are continuous with each other. This view is opposed to the old idea of epistemology being the foundational discipline for sciences.

At the heart of methodological continuity lies the reflexivity of the knowing process. It begins with the assumption that we already have some knowledge. We examine that knowledge with a view to discovering the cannons and principles through which we have come to acquire it. In other words, by examining what we already know, we come to understand the method of knowing. And by applying that method we can learn more about the world.

But what we have learned about the method of knowing can be applied not only for knowing more about the world; it can also be applied to the process of knowing itself. It is for this reason that Quine's description of naturalized epistemology as "science self-applied" is a good one. The idea of epistemology as self-application of method is very important in the light of the second crisis of epistemology we have discussed, namely the internal conflicts in epistemology. We saw that although modern epistemology aimed at settling disputes regarding truth and knowledge, it ended by creating more disputes within its own ranks, like a malfunctioning village *panchayat*. Therefore, if epistemology is to perform its assigned task, it must first of all put its own house in order. It is trying to put its own house in order that epistemology discovers the value of methodological continuity. Since epistemology aims at settling cognitive disputes, to the extent that epistemology itself makes controversial knowledge-claims, the method it applies to others must be applied also to itself. The perennial demand, "Physician heal thyself!" lies at the heart of methodological continuity between sciences and epistemology.

Continuity, of course does not mean sameness. Epistemology being a theory of knowledge of all kinds, we should not expect it to follow exactly the same method that is followed by one kind of knowledge (science). What continuity implies is that there are significant similarities between the methods followed. While there could be differences in the various methods of human knowing there is a core to the whole process that indicates certain uniform dynamics. In order to find this dynamics an examination of the scientific practice can be helpful.

Check Your Progress I

Note: a) Use the space provided for your answer.

b) Check your answers with those provided at the end of the unit.

1) Discuss the two main forms of Naturalism considered in this unit.

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2) How does James Maffie describe naturalism? What is meant by Methodological continuity?

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The Practice of Science: A Case Study

Our example is a landmark case in the history of medical science: Ignaz Semmelweis, working as a medical doctor in Vienna General Hospital in the 19th century, noticed the large number of women who delivered their babies in one of the Maternity Divisions of the hospital died of "childbed fever" (Puerperal Fever). A number of factors about these deaths puzzled Semmelweis, including the fact that the death rate was far higher in the First Maternity Division where medical students worked than in the Second Division where ordinary midwives took care of the women. The contrast was as follows:

Year	First Division	Second Division
1844	8.2%	2.3%
1845	6.8%	2.0%
1846	11.4%	2.7%

In order to resolve this puzzling happening Semmelweis began by considering various tentative solutions (called "hypotheses") to the problem. These were some of the possibilities he considered for explaining these excessive number of deaths in the First Division.

1. The deaths are due to an epidemic
2. The deaths are due to overcrowding in the First Division
3. The deaths are caused by the rough handling of the patients by the medical students in the course their examination.
4. The deaths are caused by fear generated by the appearance of priests ministering to the dying patients!

5. The deaths were due to the position in which the women in the First Division gave birth. (Women in the first Division delivered babies lying on their backs whereas in the Second division the women delivered lying on their sides).

Now that there are many possibilities for explaining these excessive deaths in the First Division (5 of which are mentioned and others not considered), the question to consider is which one can be considered true. How is one to rationally accept any of these 5 beliefs or any other that is not mentioned? This is the epistemological task that confronted Semmelweis. He sets about patiently examining each hypothesis. Let us examine how he did it.

Consider the first hypothesis that the deaths were due to an epidemic. If this were to be true, he reasoned, how could an epidemic selectively affect the First Division and not the Second? That is not likely! Moreover, the newspapers carried no reports of an epidemic in the city. To compound matters, there were some women who delivered their babies on the way to the hospital and were brought into the First division only for postnatal care. Even among them the death rate was comparatively lower than those who delivered in the First Division. All of these militated against the first hypothesis and Semmelweis abandoned that as a plausible explanation. The second hypothesis is also easy to check for its truth. Semmelweis noticed that the Second Division was even more crowded than the First (partly because news had spread that those entering the First were more likely to die than those entering the Second!). Faced with this data, the second hypothesis also was given up. In a similar fashion, each of these hypotheses had to be abandoned. Semmelweis was completely at a loss.

It is then that a colleague of his began to develop symptoms similar to those of the women suffering from childbed fever and in a few days he died. The major difference was that while the women developed the symptoms after childbirth, his colleague developed the symptoms after getting a small wound in the process of performing an autopsy. This leads him to suspect that the death of his colleague was caused by blood poisoning or what he considered as the introduction of "cadaveric matter" into the blood stream while performing the autopsy. This prompts Semmelweis to make a brilliant guess that the cause of childbed fever was the same. Since the medical students who attended to the women in the First Division, unlike the midwives in the Second Division, often came to their maternity duty after performing autopsy on dead bodies without cleaning their hands properly, they were the carriers of infection. Semmelweis tests out this hypothesis by instructing the medical students to properly disinfect their hands prior to their examination of the women and it produced dramatic results. Thus the last hypothesis was confirmed. Not only did this hypothesis explain the high mortality rates in the First Division, it also explained why the mortality rate among the women who gave birth on the road was lower. Although their hygienic conditions were not very good, they managed to escape being infected by the medical students!

There are a number of things an epistemologist can learn from cases like this. First of all, let us reflect on the method employed.

Hypothetico-Deductive Method

When we examine this case we find that there are three basic steps in the process employed by Semmelweis:

1) It begins with a problem he confronted, namely, the high death rate due to childbed fever in the First Division of the hospital;

2) Various tentative solutions (called hypotheses) are suggested as possible solutions to the problem;

3) Those hypotheses are tested to see which of them, if any, is rationally acceptable; in this case the first five hypotheses were rejected and a sixth one that was discovered by chance came to be accepted.

Since it begins by identifying a problem and tries to find solutions to it, this model of knowing is sometimes referred to as the problem solving model. It is Karl Popper (1902-94), one of the best known philosophers of science of the 20th century, who made this method the corner stone of his philosophy. What is crucial to the method is the third step of testing a hypothesis. No hypothesis is accepted just because it seems to offer a solution. Only the one that can withstand a rational scrutiny is accepted; others are rejected. We have already examined the manner of reasoning done by Semmelweis in rejecting the first two hypotheses (epidemic and overcrowding). Consider now what prompts him to abandon the third hypothesis (that the deaths were caused by rough handling by the medical students). Upon scrutiny, Semmelweis found that the midwives who attended to the patients in the Second Division examined the patients in much the same manner as the medical students did in the First Division. Therefore, prima facie, it could not be the case. Even then he reduced the number of medical students in the First Division by half on an experimental basis. But this measure failed to bring down the death rate. Then this hypothesis is abandoned. Notice that the kind of reasoning involved here is in the form of a hypothetical syllogism. If the hypothesis p (high mortality rate is due to rough handling by medical students) is true, then by doing action A (reducing the number of medical students), an observable consequence q (low mortality rate) would follow. Action A is undertaken but the result does not follow. Therefore, the hypothesis is abandoned as false. The argument has the following form:

If p then, q; not q; therefore, not p.

Since this procedure involves deriving an observable consequence from a hypothesis and observing whether that consequence really obtains, this method is called the hypothetico-deductive (H-D) method. What needs to be carefully noted is that this procedure only helps us refute a hypothesis, and not to validate it. Leaving out other complexities involved in the actual practice of the method, the logical procedure seems simple enough. If a logically observable consequence of the hypothesis does not obtain, then the hypothesis is to be considered false. For this reason, this method is also called the “falsification method”.

One might object: why should it be considered suitable only for refuting a theory? After all, did it not enable Semmelweis to accept the last theory as true? Yes, he did accept the last hypothesis. The hypothesis was that the high mortality rate in the First Division was caused by the “cadaveric matter” unconsciously introduced into the blood stream of the women by the medical students. This happened because the medical students came to examine the women without taking enough care to clean their hands properly after performing autopsy. In order to test this hypothesis he asks the medical students to clean their hands thoroughly before

attending to the women. The result was a significant improvement in the situation and based on this observation, Semmelweis accepts this hypothesis as the proper explanation for the high mortality rate in the First Division. While this much is true, let us examine its logic. It has the following logical form:

If p then, q; q; therefore, p.

It does not take long to see that this is NOT a correct form of argument. Rather, it a fallacious argument, known as the fallacy of affirming the consequent. The following example will make the fallacy clear:

If it rains, the ground will be wet;

The ground is wet

Therefore, it has rained!

This, obviously, is not correct argument, as the ground could become wet in other ways than by rain! Somebody could have watered it. The point is that though a hypothesis is accepted as true for all practical purposes, it cannot be logically proved to be true. Even if numerous experiments have shown that the expected observational results follow, still the hypothesis is not logically proven, and cannot be proven either. At best, those numerous supporting observations can be taken as confirming the hypothesis, which is not the same as logically proving it. For all practical purposes we may accept something to be true and may not want further evidence but that does not mean that it is logically shown to be true.

Another important point to be learned from the given example is that falsification is a method of justification, and not of discovery. How one comes to entertain a hypothesis (discovery or origin of a hypothesis) is of no consequence as far as the Popperian method is concerned. In the case of Semmelweis the hypothesis originated in the accidental death of his colleague and the similarity of the symptoms shown by his colleague and the women who suffered from childbed fever. This can be said of scientific method in general. Scientific method is concerned with the justification of knowledge than with its origins: Origins of a belief may be as lowly as a lucky guess (as in the case of Semmelweis) or a long drawn out empirical study. But that is of no consequence; what matters is that the hypothesis is tested through observational consequences deduced from it.

The fact that acceptability of a hypothesis is a matter of logic is important in as much as much as it eliminates the danger of subjectivity that is involved in the search for certainty. It is for this reason that Popperian epistemology is “epistemology without a knowing subject”, to use Popper’s own words. It means that in checking whether a belief is true, the individual psychology of the believer is not important. A proposition can be checked for its truth, even if no one believes it.

Although we have considered the H-D method is some detail and tried to say that epistemology can also learn from it, we should not go to the other extreme and say that epistemology is H-D method. In other words, we should not take the “continuity of method” to mean “identity of method”. There are also differences. For example, Semmelweis could predict observational consequences of the hypotheses he was testing. In this matter epistemology is different, as it hardly has any place for prediction. How is testing of theories to be done in epistemology, then? Here testing is done by checking whether the theory is able to give a

coherent account of the relevant phenomena. When we look closely, this is not completely different in science. In the given example, we see that Semmelweis is attending to the phenomena related to the problem of high death rates. Such phenomena include the fact that the death rate in the other Division is lower, there are no reports of epidemic in the town, mortality rates among the "road birth" cases are low and so on. The final solution may be seen as giving a coherent account of all these phenomena. It is this idea of giving a coherent account of the relevant phenomena, rather than prediction that is important in epistemology. Thus, although there is continuity of method, there are also differences.

Check Your Progress II

Note: a) Use the space provided for your answer.

b) Check your answers with those provided at the end of the unit.

1) Briefly describe the H-D method.

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2) Why is it impossible to prove a scientific hypothesis?

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4.5 CONTEXTUAL CONTINUITY

Contextual continuity is the idea that epistemology, like science, does not start with rock bottom foundations that presupposes no other beliefs. On the contrary, both sciences and epistemology are embedded in specific contexts and hence have their presuppositions. This is exactly what we find in the given example from science. We see that Semmelweis is not interested in undoing and rebuilding the whole of medical knowledge of his times, (much less the whole of human knowledge!!) Rather, as a trained physician he takes for granted the medical science of his times. But then he comes across a problem for which he had no ready made solutions. It is this problem that prompts his experiments.

Contextual continuity claims that this applies not only to the sciences but to all knowledge. Naturalized epistemology, then, does not seek to rebuild the whole

of human knowledge from a few absolutely certain beliefs, as the foundationalists attempted to do. Rather it begins by taking for granted a lot of beliefs that are not problematic. Taking all such beliefs for granted, it focuses upon beliefs that are problematic. Popper is such a strong advocate of contextual continuity that he goes to the extent of saying that "any rational theory, no matter whether scientific or metaphysical, is rational only … because it is an attempt to solve certain problems." In as much as contextual continuity points to the starting point of epistemology as the problematic instances of knowledge, it is closely linked to the methodological continuity.

Since naturalized epistemology does not begin with a zero point, it retains some features of coherentist justification. This form of justification is made popular by Otto Neurath. According to him our knowledge is like a ship and the epistemologist is like voyager in the ship in the middle of the sea. Even if he notices that his ship is leaking, he cannot come to shore to repair the boat or get a new one. All that can be done is to repair it even while remaining in it. For that he stands on planks that are relatively healthy and tries to replace other parts that are leaking. So too, with our knowledge: standing on planks of relatively unproblematic knowledge we try to replace the parts that are problematic. On the other hand, it is not purely coherentist either. Notice that there are observable consequences on the basis of which Semmelweis rejects or accepts a hypothesis. Similarly in natrualized epistemology, pure coherence of beliefs is not enough; rather a coherent account of phenomena is required, where phenomena is understood as non-controversial observational data available either through the senses or the mind. While epistemology may not have place for predictions as in the natural sciences, observations are still important, where observation is understood as observation of non-controversial phenomena.

4.6 FURTHER IMPLICATIONS OF NATURALIZED EPISTEMOLOGY

One result of forgoing foundational ambitions is the acceptance of the fallibility of knowledge. What is accepted as true in science today may be replaced by something else tomorrow. Popper would say that the scientific theories are like a building built on piles erected in a swamp. "if we stop driving the piles deeper, it is not because we have reached firm ground. We simply stop when we are satisfied that the piles are firm enough to carry the structure, at least for the time being." This can be said of other kinds of knowledge too. Fallibility of knowledge, then, is one of the major implications of contextual continuity.

A second implication concerns the goal of epistemology. Having accepted that human condition is like that of Neurath's sailors in the sea, naturalized epistemology cannot hope to rebuild the whole edifice of knowledge anew as the foundationalists hoped. What does it seek to do then? Popper would say that the central problem of epistemology is the growth of knowledge, not that of confronting sceptics. This is related to the reflexive character of epistemology we have mentioned: reflecting upon what we already know we discern the dynamics of knowing and then applying that dynamics to what is not known, we increase our knowledge.

Check Your Progress III

Note: a) Use the space provided for your answer.

b) Check your answers with those provided at the end of the unit.

1) Briefly explain contextual continuity between sciences and epistemology.

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2) What are some of the implications of naturalized epistemology?

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4.7 LET US SUM UP

Naturalized epistemology is best seen as an attempt to deal with the crises faced by modern epistemology. As opposed to the method of *a priori* armchair reflection promoted by the moderns, naturalized epistemology looks at the practice of scientists and seeks to learn lessons from that for knowing in general. Although the initial versions of naturalism focussed almost exclusively on the relationship between cognitive psychology and epistemology, a broader view takes sciences and epistemology as continuous with each other.

4.8 KEY WORDS

Cognitive dispute : a dispute or a difference of opinion regarding the truth of a knowledge claim

Foundationalism : the idea that the whole body of our knowledge can be built up or justified from the beginning without assuming any prior knowledge. This view is opposed to the coherentist view.

Coherentism : the view any justification of beliefs is done by relying on some set of beliefs that are taken for granted as true. It opposes the foundationalist idea that we can get rid of all our beliefs and begin building our knowledge from the beginning.

Phenomena : plural of phenomenon, something that is observable and therefore, non-controversial. Observation may be done either through the senses or the mind.

4.9 FURTHER READINGS AND REFERENCES

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4.10 ANSWERS TO CHECK YOUR PROGRESS

Answers to Check Your Progress I

1) The two forms of naturalism discussed in this unit are: Replacement Naturalism and Cooperative Naturalism. The main issue between them is whether empirical psychology is to be seen as taking the place of epistemology or as merely contributing to it. Replacement naturalism suffers from an inherent circularity where science is sought to be validate on the basis of the findings of those very sciences. An even more serious problem was pointed out by Hilary Putnam that it eliminates the normative or evaluative dimension of epistemology altogether. Cooperative Naturalism does not seek to replace epistemology with psychology. It holds that while evaluative questions are essential to epistemology, empirical results from sciences are important and useful for making progress in addressing evaluative questions.

2) James Maffie gives a broad characterization of Naturalised Epistemology, according to which the distinguishing feature of naturalized epistemology is the continuity between epistemology and science. Methodological continuity is the idea that the methods of inquiry followed in the sciences and in epistemology is continuous with each other. This view is opposed to the old idea where epistemology was seen as the foundational discipline for sciences. At the heart of methodological continuity lies the reflexivity of the knowing process. By examining what we already know, we come to understand the

method of knowing. This method can, then, be applied to the process of knowing itself. It is for this reason that Quine considered naturalized epistemology as "science self-applied". Such self-application of method is important for overcoming the internal conflicts occurring in epistemology. Continuity, of course, does not mean sameness. Epistemology being the theory of knowledge of all kinds, we should not expect it to follow exactly the same method that is followed by one kind of knowledge (science). What continuity implies is that there are significant similarities between the methods followed.

Answers to Check Your Progress II

1) Hypothetico-Deductive (H-D) method is a method employed in scientific inquiry. It involves three steps. (1) It begins with a problem that is identified and then (2) suggests various hypotheses to resolve the problem. (3) These hypotheses are tested on the basis of observations that are deduced from them. If the derived observation is indeed available, then the hypothesis accepted as likely to be true, although it will have to be confirmed by further tests. However, if the derived observation does not occur the hypothesis is rejected as false on the basis of the following valid argument form: If p then q; not q; therefore, not p. (If the hypothesis p is true, then by doing action A an observable consequence q would follow. Action A is undertaken but the result does not follow. Therefore, the hypothesis is abandoned as false. The heart of the H-D method, in other words, is the process of falsification or refutation of a hypothesis rather than verification or proving of it.

2) It is impossible to logically prove a hypothesis such a proof would be based on a fallacy, the fallacy of affirming the consequent. It has the following form: If p then q; q; therefore p. The fallacious nature of this argument form can be seen from the following example:

   If it rains, the ground will be wet;

   The ground is wet

   Therefore, it has rained!

   This, obviously, is not correct argument, as the ground could become wet in other ways than by rain! The point is that though a hypothesis is accepted as true for all practical purposes, it cannot be logically proved to be true. Even if numerous experiments have shown that the expected observational results follow, still the hypothesis is not logically proven. At best, those numerous supporting observations can be taken as confirming the hypothesis, which is not the same as logically proving it. We may accept something to be true and may not want further evidence but that does not mean that it is logically shown to be true.

Answers to Check Your Progress III

1) Contextual continuity is the idea that epistemology, like science, does not start with rock bottom foundations that presupposes no other beliefs. On the contrary, both sciences and epistemology are embedded in specific contexts and hence have their presuppositions. Naturalized epistemology, then, does not seek to rebuild the whole of human knowledge from a few absolutely

certain beliefs, as the foundationalists attempted to do. Rather it begins by taking for granted a lot of beliefs that are not problematic. Taking all such beliefs for granted, it focuses upon beliefs that are problematic with a view to resolving their problematic character. Since naturalized epistemology does not begin with a zero point, it retains some features of coherentist justification. According to an imagery made popular by Otto Neurath, the epistemologist is like voyager in a ship in the middle of the sea. When he notices that ship is leaking, there is no way in which he can come to shore and repair the whole boat or get a new one. All that can be done is to repair it even while remaining in it. For that he stands on planks that are relatively healthy and try to replace other parts that are leaking. So too, with our knowledge: standing on planks of relatively unproblematic knowledge we try to replace the parts that are problematic.

2) One of the major implications of naturalizing epistemology is the acceptance of the fallibility of all knowledge. Popper would say that the scientific theories are like a building built on piles erected in a swamp. “if we stop driving the piles deeper, it is not because we have reached firm ground. We simply stop when we are satisfied that the piles are firm enough to carry the structure, at least for the time being.” This can be said of other kinds of knowledge too.

   Another implication concerns the goal of epistemology. Having accepted that human condition is like that of Neurath’s sailors in the sea, naturalized epistemology cannot hope to rebuild the whole edifice of knowledge anew as the foundationalists hoped. Instead, it has a much more limited but tangible goal: the advance human knowledge. This is a Popperian view of epistemology.