Chapter V

Philosophy of Science

One could say "every view has its charm," but that would be false. The correct thing to say is that every view is significant for one who sees it as significant.

Remarks on Frazer's Golden Bough.

Early Wittgenstein: Early Wittgenstein's thoughts have been restricted to science, even if his thoughts were philosophical early Wittgenstein cannot express his philosophical thoughts. He cannot express those thoughts because he has laid a ban on philosophy, a ban on the expression of philosophy. It is not as if philosophy could have been given expression if Wittgenstein had not laid this restriction but that early Wittgenstein finds the expression of philosophy to be inherently impossible. Impossible because it is like the logic of language which cannot be expressed in language. But the unexpressed is more important to Wittgenstein than the expressible for he says about his Tractatus: "My work consists of two parts: the one presented here plus all that I have not written. And it is precisely this second part that is the important one." For early Wittgenstein we have unimportant things that can be expressed (science) and important things that cannot be expressed (philosophy). But by maintaining silence one does not wish them.

out of existence perhaps, they exist silently without making much noise (like the scientists). The existence of the inexpressible is given credence by his view that what cannot be said, can be shown.

Why do we say or show anything? Saying and showing is concerned with something or someone other than oneself, i.e., it is used mainly for communication with others. If there were no other persons there would not be any need to communicate with others. However, now that there are people present beside ourselves we do communicate with them and explain to them whatever we want to. But what is the vehicle of communication?

According to Wittgenstein, "with propositions we make ourselves understood also "It belongs to the essence of a proposition that it should be able to communicate a new sense to us."\textsuperscript{353} Syntactical rules of a language or picture cannot be stated in the language or picture itself, they are shown or exhibited through the picture but not stated in the same medium as Wittgenstein points out "A picture cannot however depict its pictorial form; it displays it."\textsuperscript{354} In the \textit{Tractatus} the unsayable is connected with the mystical and so cannot be said. In the \textit{Notebooks} Wittgenstein further remarks. "In order that you should have a language which can express or say everything that can be said, this language must have certain properties; and when this is the case,  

\textsuperscript{353} \textit{Tractatus} 4.027.  
\textsuperscript{354} \textit{Ibid.} 2.172.
that it has then can no longer be said in that language or any language.  

Also emphasizing the connection between a proposition i.e. what is stated and reality or the world he says "every real proposition shows something, besides what it says, about the Universe: for, if it has no sense, it can't be used; and if it has a sense, it mirrors some logical property of the Universe." Perhaps this is the reason why he says that "the totality of true thoughts is a picture of the world." It has also led him towards his correct Tractarian method of doing philosophy. He states "The correct method in philosophy would really be the following: to say nothing except what can be said, i.e. propositions of natural science - i.e. something that has nothing to do with philosophy - and whenever someone else wanted to say something metaphysical, to demonstrate to him that he had failed to give meaning to certain signs in his propositions." Here we see that Wittgenstein has banned expression of philosophy and expression is reserved only for the sciences because the sciences deal with the concrete verifiable things of the universe and not with anything metaphysical. When Wittgenstein recommends "what we cannot speak about we must pass over in silence" He maintains silence over those subjects only e.g. metaphysics which were thrown into flames even by Hume.

Yet even as early as the Tractatus Wittgenstein has given

---

357. Tractatus 3.01.  358. Ibid., 6.53.
359. Ibid., 7.
a paradigmatic explanation of science. He calls his world picture signifying laws of nature as "a priori insights about the forms in which the propositions of science can be cast." These insights though useful in giving a unified description of the world need not remain fixed. One may have a choice between alternate modes of description of the world. Wittgenstein explains, "Let us imagine a white surface with irregular balck spots on it. We then say that whatever kind of picture these make, I can always approximate as closely as I wish to the description of it by covering the surface with a sufficiently fine square mesh, and then saying of every square - whether it is black or white. In this way I shall have imposed a unified form on the description of the surface. The form is optional, since I could have achieved the same result using a net with a triangular or hexagonal mesh... The different nets correspond to different systems of describing the world." This remark of early Wittgenstein seems to be in tune with the later remarks of Wittgenstein on World - Pictures and exhibits a continuity between the two Wittgensteins, the earlier and the later, at least in some aspects.

Even though Wittgenstein gives much importance to science, all along the Tractatus he exhibits his dissatisfaction with science when he makes the observation that "We feel that even when all possible scientific questions have been answered the problems of life remain completely untouched." Since my work is primarily related to Later Wittgenstein I wish to devote greater length to it and therefore now concentrate my attention to-

360. Ibid., 6.34.
361. Ibid., 6.341.
362. Ibid., 6.341.
wards his later work.

Later Wittgenstein: It has already been mentioned in Chapter 1 that language game is a source of anxiety to both the Wittgensteins, so also to the two schools of thought that he inspired, i.e. Logical Analysis and Ordinary Language Analysis Movement. However there are further aspects which one has to consider when reading Wittgenstein's views on language-games. When Wittgenstein discusses the various language games in the **Philosophical Investigations** he is discussing them not merely as different languages but as different language games which includes the language-game of science. When he makes a comparison between languages (2), (8) and our everyday language he suggests that we should not consider language (2) or (8) to be incomplete languages because they consist of orders only when compared to our everyday language. His questioning whether our language was complete before the symbolism of chemistry was added points to the fact that when he is referring to a language it includes scientific language and also that no language is incomplete. For according to Wittgenstein, 'to imagine a language means to imagine a form of life.' Augustine's example is used as an illustration of a particular picture of the essence of human language i.e., Every word has a meaning.

In the **Philosophical Investigations** Wittgenstein refers to the "ostensive teaching of words." - I say that it will form an important part of the training. 364. In the case of learning 363, **Philosophical Investigations**, p. 364. **Ibid.**
a scientific language ostensive teaching can refer to experiments and training of scientists in a particular research tradition. For scientists have their own meanings associated to particular words and concepts. Further he states that "This ostensive teaching of words can be said to establish an association between a word and a thing...But if the ostensive teaching has this effect, am I to say that it effects an understanding of the word?" 365

Wittgenstein agrees that "with different training the same ostensive teaching of these words would have effected a quite different understanding." 366 The same thing is called by Kuhn by the name of different research traditions formed by the esoteric training received by the scientists. Kuhn has specified this only in the case of language games of science whereas Wittgenstein thinks this is true of all language games.

The view of later Wittgenstein especially in his On Certainty 367 have a striking resemblance to the views of Kuhn as expressed in his Structure of Scientific Revolutions. 368 Historical curiosity led me to write on Wittgenstein's anticipation of Kuhn's thoughts. My curiosity was aroused by some remarks Professor von Wright made in his book on Wittgenstein. 369 Though von Wright does not go into the details, he has hinted at the similarity between Wittgenstein and Kuhn. I have tried to add details to von Wright's analysis. My discussion is purely exposi-

tory. I shall use the short symbolic expression SSR for Structure of Scientific Revolutions and OC for On Certainty.

The key concept in Kuhn's SSR is the notion of a paradigm. To the notion of a paradigm corresponds Wittgenstein's notion of 'world-picture' as mentioned in OC. (The idea of the 'language-game' is the precursor of the idea of the 'world-picture'.) Referring to this correspondence von Wright remarks, "Wittgenstein's investigations into the role of the concept of a world-picture have, I think interesting applications to the sociology of knowledge." 370  The work on the sociology of knowledge to which he then refers is Kuhn's SSR. He finds Kuhn's paradigm to be a "good illustration for Wittgenstein's idea about the role of world-picture." 371  But von Wright does not take further steps, rather he deviates to the issue of the distinction between "the natural science and the science of man." 372  Therefore I would like to continue the steps suggested by von Wright but not actually taken by him.

Kuhn has not clearly defined what a paradigm means. In fact, Margaret Masterman has pointed out 22 different ways in which Kuhn uses the expression 'paradigm'. 373  But this is not a serious objection. Though Kuhn has failed in defining a paradigm he has certainly succeeded in showing what a paradigm does. It does so many different things. He gives a justification for his failure in defining a paradigm by referring to the concept of 'family

resemblance' held by Wittgenstein, i.e., giving instances of
games, chairs, etc., rather than defining game, chair etc. Kuhn
refers to Wittgenstein, saying, "For Wittgenstein, in short,
games and chairs, and leaves are natural families, each constitu-
ted by a network of overlapping and crisscross resemblances.
The existence of such a network sufficiently accounts for our
success in identifying the corresponding object or activity." 374
Thus, through the Wittgensteinian escape-route Kuhn avoids the
definition of a paradigm. Instead of defining a paradigm he gives
its concrete cases. And one case cannot be substituted for the
other as chess cannot be played in the place of football. This
becomes further evident from his introductory remark on his use
of paradigm. "The concept of paradigm will often substitute for
a variety of familiar notions." 375

Kuhn wonders about the priority of concrete scientific achie-
vements, over concepts, laws and theories. He asks, "Why is the
concrete scientific achievement prior to the various concepts,
laws, theories and points of view that can be abstracted from
it?" 376 According to Wittgenstein too it is the "concrete cases,
which alone could have helped him to understand the usage of
the general term." 377 Here may I suggest 'paradigm' to be a gene-
ral term just as 'game' or 'leaf' is a general term, and that
it can be got hold of only by observing concrete particular in-
stances. Kuhn follows Wittgenstein in drawing our attention from
the general to the particular cases and so both Wittgenstein
and Kuhn are anti-essentialists and therefore anti-platonists.

According to Kuhn "the study of paradigms....is what mainly prepared the student for membership in the particular scientific community....his subsequent practice will seldom evoke overt disagreement over fundamentals."\textsuperscript{378} Similarly Wittgenstein points out "When Moore says he knows such and such, he is really enumerating a lot of empirical propositions, that is, which have a peculiar logical role in the system of our empirical propositions."\textsuperscript{379} The 'propositions' of Wittgenstein which have a peculiar logical role in our system of empirical propositions are no different from the propositions that form the core of a paradigm, e.g., "whatever may happen in the future, - we know that upto now it has behaved thus in innumerable instances. This fact is fused into the foundations of our language game."\textsuperscript{380}

Reflecting further on the nature of the core Kuhn remarks, "Men whose research is based on shared paradigms are committed to the same rules and standards for scientific practice. That commitment and the apparent consensus it produces are prerequisites for normal science, i.e., for the genesis and continuation of a particular scientific tradition."\textsuperscript{381} But this commitment to rules does not mean that I can interpret these rules successfully or even make a list of them. As he remarks, "Lack of a standard interpretation or an agreed reduction to rules will not prevent a paradigm from guiding research."\textsuperscript{382}

\textsuperscript{378. SSR} p. 15. \\
\textsuperscript{379. CC.} p. 130. \\
\textsuperscript{380. Ibid.} p. 558. \\
\textsuperscript{381. SSR.} p. 11. \\
\textsuperscript{382. Ibid.} p. 44
is "aided by but does not depend upon the formulation of rules and assumptions." 383 He goes to the extent of saying, "Indeed, the existence of a paradigm need not even imply that any full set of rules exists." 384

The corresponding view held by Wittgenstein about his world-picture is as follows: "The propositions describing world-picture ... are like rules of a game; and the game can be learnt purely practically, without learning any explicit rules." 385 He further adds, "I do not explicitly learn the propositions that stand fast for me. I can discover them subsequently like the axis around which a body rotates." 386 Wittgenstein even blames rules. He says, "Our rules leave loopholes open, and the practice has to speak for itself." 387 Thus like Kuhn Wittgenstein accepts commitment to rules, yet this commitment does not mean that first I must learn these rules.

Corresponding to Kuhn's idea of fixed core and fluid periphery Wittgenstein states — "It might be imagined that some propositions, of the form of empirical propositions, were hardened and functioned as channels for such empirical propositions as were not hardened but fluid." 388 In a more picturesque way he further states, "the bank of that river consists partly of hard rock, subject to no alteration or only an imperceptible one, partly of sand, which, now in one place now in another gets washed away or deposited." 389 In a non-picturesque way he refers to the system of beliefs formed by a child, "in that system some things stand unshakeably fast and some are more or less liable

383. Ibid.
384. Ibid. p.41
385. Ibid. p.95.
386. Ibid., 152.
387. Ibid. 139.
388. Ibid. 96.
389. Ibid., 99.
to shift. What stands fast does so, not because it is intrinsically obvious or convincing; it is rather held fast by what lies around it."\(^{390}\) Elaborating on the idea of the core and periphery Wittgenstein further states, "I have arrived at the rock bottom of my convictions. And one might almost say that these foundation-walls are carried by the whole house."\(^{391}\)

But can there be any justification for having the propositions which we do have as the core? It seems that no justification can be given. Wittgenstein raises the question, "Does my telephone call to New York strengthen my conviction that the earth exists?\(^{392}\) He reacts to this question, "Much seems to be fixed, and it is removed from the traffic. It is so to speak shunted on to an unused siding."\(^{393}\) This shunting to an unused siding does not make it useless, rather Wittgenstein means that such facts do not require justification at every stage. In fact for Kuhn such questions do not arise at all because of the nature of paradigm initiation which is "a dogmatic initiation in a pre-established tradition that the student is not equipped to evaluate."\(^{394}\) This is an echo of Wittgenstein's view, "Now it gives our way of looking at things and our researches, their form. Perhaps it was once disputed. But perhaps, for unthinkable ages, it has belonged to the scaffolding of our thoughts."\(^{395}\)

\(^{390}\) Ibid., 144.  
\(^{391}\) Ibid., 248.  
\(^{392}\) Ibid., 144.  
\(^{393}\) Ibid.  
\(^{395}\) GC 136.
The world-picture of OC has its genesis in the language-game of The Blue and Brown Books. Concluding "language-games" Wittgenstein remarks in the Blue Book, "children are taught their native language by means of such games....we are not however, regarding the language games which we describe as incomplete parts of a language, but as languages complete in themselves, as complete systems of human communication." Here the requirement of language games to be complete in themselves has its analogue in Kuhn's requirement of paradigms to be complete in themselves and of paradigm initiation, i.e., of children being taught these paradigms.

In his OC too Wittgenstein often substitutes language-game for world-picture. Consider his remark, "You must bear in mind that the language game is so to say something unpredictable. It mean it is not based on grounds. It is not reasonable (or unreasonable.) It is there -- like our life." Like Kuhn's paradigm Wittgenstein's language-game or world-picture is not questioned. Its acceptance is neither rational nor irrational.

Even though the acceptance of a world-picture is neither rational nor irrational, the acceptance of one world-picture does not hold us captive forever. We do change our world view and adopt others.

Concerning the change of paradigms Kuhn points out, "When


397. BB p. 81.

398. Ibid., 559.
paradigms change the world itself changes with them." There
is a sense in which a new paradigm brings with it a new world.
As Kuhn points out, "paradigm changes do cause scientists to
see the world of their research engagement differently.....
after a revolution scientists are responding to a different
world." But these scientists are not aware of the changes.
As he clarifies, "If perceptual switches accompany paradigm changes. We may not expect scientists to attest to these changes directly. Looking at the moon, the convert to copernicanism does not say, "I used to see a planet, but now I see a satellite"...the scientist with a new paradigm sees differently from the way he had seen before." 401

Wittgenstein exhibits a similar view when he remarks, "I
do not say that Moore could not convert a king to his view,
but it would be a conversion of a special kind; the king would
be brought to look at the world in a different way." 402 The switch
from one world-picture to the other is a kind of conversion;
it is looking at the world in a different way. The same idea
is expressed when Wittgenstein says, "Further experiments cannot
give the lie to our earlier ones, at most they may change our
whole way of looking at things." 403 But this change, this switch
is not easy so long as a given world-picture has a grip over
me - "What could induce me to believe the opposite?.....nothing
in my picture of the world speaks in favour of the opposite." 404
If I believe the opposite I must give up my present world-picture.

399. SSR p.111. 400. Ibid. 401. Ibid. p. 115.
402. CC 92. 403. Ibid. 93. 404. Ibid. 93.
Wittgenstein's remarks concerning "the conversion of natives" and "the conversion of king" and his further remark concerning the conversion "of a child to believe in God" have their echo in Khun. Khun considers conversion to a new paradigm as if it is a conversion to a new religion. Kuhn explains the switch from one paradigm to the other in terms of 'conversion', because the switch "must occur all at once." First he makes an attempt to explain this sudden change in terms of 'gestalt switch' and 'duck rabbit switch'. Later he refers to paradigm shift in terms equivalent to political and religious conversion. Talking of the decision made about paradigm conversion he states, "a decision of that kind can only be made on faith." Thus the switch from one paradigm to the other is based on faith, like the conversion from one religion to the other.

Kuhn's idea of two paradigms being incommensurable has an analogue in Wittgenstein, when he remarks "When children play at trains their game is connected up with their knowledge of trains. It would nevertheless be possible for children of a tribe unacquainted with trains to learn this game from others, and play it without knowing that it was copied from anything. One might say that the game did not make the same sense to them as to us." This remark is similar to Hanson's example of Kepler and Tycho Brahe standing on a hill watching the sun. "Kepler regarded the sun as fixed, it was the earth that moved. But Tycho

\[^{405}\text{Ibid., p.92.}\] \[^{406}\text{SSR, p.156.}\] \[^{407}\text{Ibid., p.158.}\] \[^{408}\text{Philosophical Investigations, Basil Blackwell, Oxford 1976, 282, further referred as P.I.}\]
followed Ptolemy and Aristotle in this much at least; the earth
was fixed and all other celestial bodies moved around it. 409
This raises the question whether "Kepler and Tycho see the same
thing in the east at dawn?" 410

Kepler and Tycho Brahe in a sense see the same event but
in a sense they see different things because they belong to dif-
ferent paradigms, and the sunrise is only one event in the string
of events. According to Wittgenstein's world-picture "What I
hold fast to is not one proposition but a nest of propositions."
411 "Our talk gets its meaning from the rest of our proceedings."
412 So whether Kepler and Tycho see the same thing will be known
if the conclusions that follow from their data are the same,
and obviously their conclusions are not the same.

Sometimes one may use terminology that belongs to different
world-pictures or paradigms as will be evident from the history
of any one scientific word like 'force' or 'atom'. Wittgenstein
too considers the use of 'time' in two different paradigms. He
says about the use of terms like "five o'clock", "an hour",
"a long time", "a short time" etc., in one case in connection
with a clock, in the other independent of one. 413 He goes on
to say that "We have now two uses of these terms, and no reason
to say that one of them is less real and pure than the other." 414

409. Patterns of Discovery, N.R. Hanson, Cambridge Univ. Press
1958, p. 5.
410. Ibid.
411. OC 225.
412. Ibid., 229.
413. BB. p. 106 game 53.
414. Ibid.
When a person is within one paradigm or world-picture he is in the grip of, as Kuhn would put "strong network of commitments conceptual, theoretical, instrumental, and methodological." 415

These then are the circumstances under which a person must learn particular concepts of a paradigm. In fact, particular concepts within a paradigm make sense only because of the surrounding network of commitments. In Wittgenstein's words "we patiently examine how this sentence is to be applied. What things look like round about it" 416

Talking of the priority of theories or world-picture Wittgenstein states "a language-game does not have its origin in consideration. Consideration is part of a language game. And that is why a concept is in its element within the language-game." 417

He further states. "My judgements themselves characterise the way I judge, characterise the nature of judgement." 418 i.e., the acceptance of a particular world-picture characterises the way I make all further judgements. Wittgenstein adds — "Our knowledge forms an enormous system. And only within this system has a particular bit the value we give it." 419 He means to say that only within the vast knowledge that has been accepted, and systematised by our world-picture can individual problems find a place and be able to seek solutions. Kuhn expresses similar views in his statement — "What a man sees depends both upon what he looks at and also upon what his previous visual experience has taught him to see. In the absence of such training there can

417. Ibid., 391. 418. OC, 149. 419. OC 410
only be, in William James's phrase, a bloomin' buzzin' confusion.  

For Kuhn the life of a science is divided into normal science and revolutionary science. Wittgenstein too makes such a distinction when he says, "It is only in normal cases that the use of a word is clearly prescribed, we know, are in no doubt, what to say in this or that case. The more abnormal the case, the more doubtful it becomes what we are to say. And if things were quite different from what they actually are ...if rule became exception and exception rule; or if both became phenomena of roughly equal frequency - -this would make our normal language-games lose their point." Thus normal scientific tradition will be shattered and revolutionary science will set in, i.e., a state of crisis will emerge.

Kuhn also considers separately how progress is made in these two stages, the stage of normal science and that of revolutionary science, which occur repeatedly in the growth and development of any mature science. I shall discuss progress in normal science first - - Kuhn points out "the reception of a common paradigm has freed the scientific community from the need constantly to re-examine its first principles...Inevitably, that does increase both the effectiveness and the efficiency with which the group as a whole solves new problems." The solution of new problems surely means progress. But much importance is given to the scientific community. The scientific community plays a pivotal role

\[419b\] SSR p. 113.  
\[420\] PI 142.  
\[421\] SSR pp. 163-164.
to evaluate progress within a paradigm as well as during revolutionary science when it helps in the choice of a new paradigm. "There are losses as well as gains in scientific revolutions, and scientists tend to be peculiarly blind to the former."  

Wittgenstein's 'mistake' in a language game is similar to Kuhn's 'anomaly' within a paradigm. Emergence of anomaly has a place only in a paradigm. As Wittgenstein remarks "There is a difference between mistake for which as it were, a place is prepared in the game, and a complete irregularity that happens as an exception." In a similar tone Kuhn states "Anomaly appears only against background provided by the paradigm."  

How an anomaly leads to paradigm change is explained by Kuhn in the following words, "Anomaly appears only against the background provided by the paradigm. The more precise and far-reaching the paradigm is, the more sensitive an indicator it provides of anomaly and hence of an occasion for paradigm change." 

If we study closely the following remark of Wittgenstein it says a similar thing. "It would strike me as ridiculous to want to doubt the existence of Napoleon, but if someone doubted the existence of the earth 150 years ago, perhaps I should be more willing to listen, for now he is doubting our whole system of evidence. It does not strike me as if this system is more certain than a certainty with it." 

422. Ibid., p. 167.  
423. OC 647.  
424. SSR p. 65.  
425. Ibid.  
426. OC 185.
the existence of the earth before 150 years leads to the rejection of our whole system of evidence, our world-picture. In order to accommodate the view that the earth did not exist before 150 years we must give up our present paradigm or world-view.

Regarding testing Wittgenstein raises some fundamental questions. He says, "An empirical proposition can be tested (we say). But how? and through what? What counts as its test?"—But is this an adequate test? Wittgenstein further questions, "what is to be tested by what?" he has then bracketed the next important question (who decides what stands fast). Kuhn has answered this bracketed question of Wittgenstein by adopting a sociological approach. According to Kuhn it is the scientific community which determines the paradigm by a common consensus and then it is this paradigm, i.e., a particular paradigm that decides 'what stands fast?' and hence also 'what is to be tested by what?' Wittgenstein too exhibits his sociological approach in the following remark, "So you are saying that human agreement decides what is true and what is false?"—It is what human beings say that is true and false, and they agree in the language they use.

Even within a paradigm testing can take place only, of one item at a time, one cannot doubt the whole paradigm within which something is being tested, we have to take something for granted i.e., we take the paradigm for granted. It is only within the

427. Ibid., 109-110. 428. Ibid., 125.
429. Ibid. 430. Cf. SSR p. 65.
431. PR 241.
context of a paradigm that testing can take place. As Wittgenstein too points out, "Does anyone ever test whether this table remains in existence when no one is paying attention to it? We check the story of Napoleon, but not whether all the reports about him are based on sense-deception, forgery and the like. For whenever we test anything, we are already presupposing something that is not tested. Now am I to say that the experiment which perhaps I make in order to test the truth of a proposition presupposes the truth of the proposition that the apparatus I believe I see is really there (and the like)?" 432 Obviously there are some things which are taken for granted, when one statement is tested it is tested on the basis of others. Even for Kuhn the statements which form the core of the paradigm are not doubted once the paradigm has been accepted.

Talking of reasoning and the tendency of clinging to the core Wittgenstein states, "If someone doubted whether the earth had existed a hundred years ago, I should not understand, for this reason: I would not know what such a person would still allow to be counted as evidence and what not." 433 Because "only the accustomed context allows what is meant to come through clearly." 434 Obviously one is not accustomed to doubt 'whether the earth had existed a hundred years ago' because in our world picture such statements are not doubted but taken for granted. as Wittgenstein elucidates -- -- "so far I have no system at all within which this doubt may exist." 435 "If someone said that 432. OC 163. 433. Ibid., 231. 434. Ibid., 237. 435. Ibid., 247.
he doubted the existence of his hands, kept looking at them from all sides, tried to make sure it wasn't 'all done by mirrors' etc., we should not be sure whether we ought to call that doubting. We might describe his way of behaving as like the behaviour of doubt, but, his game would not be ours." 436 Because "The reasonable man does not have certain doubts." 437 In fact, Wittgenstein says, "I cannot depart from this judgement without toppling all, other judgements with it." 438 If I wish to topple one such judgement "then in that case the foundation of all judging would be taken away from me." 439 That is to say a paradigm or world-picture allows some doubts but doubting the foundations of a paradigm or a world-picture will only lead to its toppling. Even "to make a mistake" according to Wittgenstein "a man must already judge in conformity with mankind." 440

It is not easy to give up the core and Wittgenstein states the difficulty to relent the hold on the core thus, "we shall stick to this opinion, unless our whole way of seeing nature changes. "How do you know that?" —I believe it." 441 Wittgenstein further states "But it isn't just that I believe in this way...... but that every reasonable person does. At the foundation of well founded belief lies belief that is not founded." 442 This however does not mean that it is, ill grounded.

Wittgenstein remarks, "Here I have arrived at the foundation of all my beliefs." This position I will hold." But isn't that

436. Ibid., 225. 437. Ibid., 220. 438. Ibid., 419
439. Ibid., 614. 440. Ibid., 156. 441. Ibid., 291.
442. Ibid., 252.
precisely, only because I am completely convinced of it? - what
is 'being completely convinced like?'\textsuperscript{443} Wittgenstein attempts
to answer this question with recourse to repeatedly confirmed
experience, as seen in the following remarks. What is the belief
that all human beings have parents based on? On experience ....
But then is that really a proof? Isn't this an hypothesis, which,
as I believe, is again completely confirmed? Mustn't we say
at every turn. "I believe this with certainty?" \textsuperscript{444}

Wittgenstein states the important role that persuasion plays
in the acceptance of a particular world-picture or paradigm -
"I can imagine a man who had grown up in quite special circum-
thances and been taught that the earth came into being 50 years
ago, and therefore believed this. We might instruct him: the
earth has long ... etc. - - We should be trying to give him our
picture of the world. This would happen through a kind of persua-
sion." \textsuperscript{445} Kuhn too states similar views - - "Debates over theory-
choice cannot be cast in a form that fully resembles logical
or mathematical prof...that debate is about premises and its
recourse is to persuasion as a prelude to the possibility of
proof." \textsuperscript{446} He states more strongly that "to persuade someone
is, I take it, to convince him that one's own view is superior
and ought therefore, supplant his own. That much is occasionally
achieved without recourse to anything like translation." \textsuperscript{447} The
same idea is expressed in Wittgenstein's remark "I wanted to

\textsuperscript{443} Ibid., 246. \textsuperscript{444} Ibid., 240-242. \textsuperscript{445} Ibid., 262
\textsuperscript{446} SSR, p. 199. \textsuperscript{447} Ibid., p. 156.
put that picture before him, and his acceptance of the picture consists in his now being inclined to regard a given case differently: that is to compare it with this rather than that set of pictures. I have changed his way of looking at things.\footnote{448}

In science it is not always reason but persuasion which has its role. Referring to the aesthetic appeal of theories Kuhn remarks, "By the time their full aesthetic appeal can be developed most of the community has been persuaded by other means."\footnote{449} Referring to the element of persuasion Wittgenstein says, "I would 'combat' the other man, but wouldn't I give him reasons? Certainly: but how far do they go? At the end of reasons comes persuasion. (Think what happens when missionaries convert natives.)"\footnote{450} Of course Wittgenstein, as is obvious from this remark treats persuasion differently from Kuhn. Persuasion becomes an instrument when reasons fail. But no such distinction is maintained by Kuhn.

Wittgenstein's remarks concerning "the conversion of natives" and the "conversion of kings" and his further remark concerning the conversion of a child to believe in God\footnote{451} have their echo in Kuhn. Kuhn considers conversion to a new paradigm as if it is conversion to a new religion, Kuhn explains the switch from one paradigm to another in terms of 'conversion', because the switch must occur all at once.\footnote{452} First he makes an attempt to explain this sudden change in terms of 'gestalt switch' and

\footnotetext{448. PI 144} \footnotetext{449. SSR p. 156.} \footnotetext{450. OC 612.} \footnotetext{451. Ibid., 107.} \footnotetext{452. SSR p. 158.}
'duck rabbit switch'. Later he refers to paradigm shift in terms equivalent to political and religious conversion. Talking of the decision made about paradigm conversion he states "a decision of that kind can only be made on faith." Thus the switch from one paradigm to the other is based on faith, like the conversion from one religion to the other.

I note without some surprise that not only Wittgenstein but Kuhn too refers to different world-pictures or paradigms as different language games or different language communities. Kuhn states, "What the participants in a communication breakdown can do is recognise each other as members of different language communities and then become translators." He further states "If they can sufficiently refrain from explaining anomalous behaviour as the consequence of mere error or madness, they may in time become predictors of each other's behaviour." However, there is a slight difference here in Kuhn's and Wittgenstein's view. Kuhn wants to refrain himself from calling a person belonging to another paradigm, mad and hopes that in time the two paradigms though disagreeable may be able to predict the behaviour of each other.

Wittgenstein on the other hand does not fear to declare the persons belonging to the other paradigm or world-picture (whom he was unable to persuade) as fool and heretic. Wittgenstein

455. Ibid.
states: "Where two principles really do meet which cannot be reconciled with one another, then each man delcares the other a fool and heretic." He also considers the misunderstanding between two such paradigms to be total and there is no chance of one predicting the behaviour of the other because predictions can be made only after understanding the other person but refusing to accept it. But Wittgenstein is not only refusing to accept the other person's world-picture, he is refusing (genuinely) to understand his world-picture.

In introducing the possibility of translation Kuhn has sacrificed incommensurability. Unless I go beyond my own paradigm there is no question of understanding a thing belonging to another paradigm.

Peter Winch agrees with Wittgenstein and so does Taylor concerning the plurality of standards of rationality — "The discourse in which matters are articulated in different societies can be very different....The standards are different, because they belong to incommensurable activities." However, both Winch and Taylor use this fact to arrive at incommensurable conclusions. Winch arrives at the conclusion that the plurality of rationality rules out judgements of superiority, whereas Taylor uses the plurality of rationality as the 'door to such judgements'.

Talking of scientific revolutions Kuhn states that they are "those non-cumulative development episodes in which an older

456. OC 611. 457. 'Rationality' p. 105
paradigm is replaced in whole or in part by an incompatible new one." 458 This idea of paradigm change (in part or whole) has an analogue in Wittgenstein where Wittgenstein likens a world picture to be "part of a kind of mythology." 459 And concerning this kind of mythology he says that "the mythology may change back into a state of flux, the river-bed of thoughts may shift. But I distinguish between the movement of the waters on the river-bed and the shift of the bed itself; though there is not a sharp division of the one from the other." 460 Here Wittgenstein has made a distinction between paradigm articulation or paradigm refinement and paradigm shift.

The aspect of paradigm articulation has been highlighted by Kuhn when he talks about paradigms in terms such as, "like an accepted judicial decision in the common law it is an object for further articulation and specification under new or more stringent conditions." 461 Corresponding to this is Wittgenstein's remark: "Our empirical propositions do not all have the same status, since one can lay down such a proposition and turn it from an empirical proposition into a norm of description." 462 He further remarks, "It might be imagined that some propositions were hardened and functioned as channels for such empirical propositions as were not hardened but fluid; and that this relation altered with time, in that fluid propositions hardened, and hard one's became fluid." 463 The above idea is similar to Kuhn's where

458. SSR p. 92. 459. OC 95. 460. Ibid., 97.
he says, "The assimilation of a previously anomalous visual field has reacted upon and changed the field itself."\textsuperscript{464} However, for Wittgenstein, "the bank of that river consists partly of hard rock subject to no alteration or only an imperceptible one, partly of sand, which now in one place now in another gets washed away, or deposited."\textsuperscript{465}

For Wittgenstein. "Knowledge is in the end based on acknowledgement."\textsuperscript{466} He further states, "not only I know, or believe, all that but the others do too. Or rather I believe that they know, that all that is in fact so."\textsuperscript{467} This acknowledgement affirms that sociology of knowledge is the base of epistemology. Wittgenstein reiterates his position quite clearly in the following remarks where he is talking of rationality with respect to certainty. Wittgenstein regards this certainty not as something akin to hastiness or superficiality, but as a form of life."\textsuperscript{468} "I want to conceive it as something animal."\textsuperscript{469} "But doesn't it come out here that knowledge is related to a decision?"\textsuperscript{470} This decision once made need not remain fixed for all time and nor is it based on any objective criteria for, "what men consider reasonable or unreasonable alters. At certain periods men find reasonable what at other periods they found unreasonable. And vice versa."\textsuperscript{471}

Acceptance of a paradigm and so also its change depends on community. As Kuhn says, "Like the choice between competing

\textsuperscript{464} SSR p. 112.  465. OC 99.  466. Ibid 378
\textsuperscript{467} Ibid., 289.  468. Ibid., 358. 469. Ibid., 359.
\textsuperscript{470} Ibid., 362.  471. Ibid., 336.
political institutions, that between competing paradigms proves to be a choice between incompatible modes of community life." This point is further emphasised, "As in political revolutions, so in paradigm choice - there is no standard higher than the assent of the relevant community." Similarly for Wittgenstein "we are quite sure of it" does not mean just that every single person is certain of it, but that we belong to a community which is bound together by science and education. "We are satisfied that the earth is round." Thus, Wittgenstein highlights the role of 'scientific community' and 'scientific education' in the acceptance of a world-picture.

Kuhn clearly maintains a similar position as Wittgenstein's view: stated above when he says, "there are no other professional communities in which individual creative work is so exclusively addressed to and evaluated by other members of the profession" Concerning education he says, "The effects of insulation from the larger society are greatly intensified by another characteristic of the professional scientific community, the nature of its educational initiation."

During a paradigm conversion the minority that does not convert to the new paradigm is ignored and is left out of the mainstream. As Kuhn says, "There are always some men who cling

Each concept is restricted to a language-game. Consider Wittgenstein's remark, "A tribe has two concepts, akin to our 'pain'. One is applied where there is visible damage -- the other is used for stomach-ache -- "But then do they really not notice the similarity? The question is "Is the similarity important to them? And need it be so? And why should their concept 'pain' not split ours up?" But", reacts Wittgenstein "his concept just is fundamentally different from ours ....But in that case it surely is as if his word could not designate the same as ours. Or only part of that. But of course it must look like that, if his concept is different."  

Mixing up two incommensurable activities feels Taylor, will only lead to confusion. He says, "The very attempt to identify separate activities here, two different goals, would have to be based on a confusion. The difference between the two...is not that they have made different selections or combinations out of the same catalogue of activities, but that their very catalogues are different and what is more incommensurable."  By his reference to different catalogues Taylor is referring to different paradigms because 'selections or combinations' out of the same paradigm will not give rise to confusion. Confusion arises only when items from one paradigm are placed in another and an attempt is made to understand them in another paradigm. This is not possible because the meaning of each concept within

484. Ibid., 381.
a paradigm is based on the surrounding network of commitments.

Kuhn's answer to the possibility of inter-theoretic discourse is also negative though the negativeness is softened by his acceptance of the thesis of translatability. For Wittgenstein on the other hand this question as well as others like it, seek an answer with finality, as if to say once they are answered nothing else matters and he is against such seeking, such finality, because for him, "In philosophising we may not terminate a disease of thought. It must run its natural course." 486

But how is the scientific community, which generally answers such questions, formed? A person who is initiated into a paradigm does not start questioning it. As Khun says, "his subsequent practice will seldom evoke overt disagreement over fundamentals." 487 Again, the "process of learning by finger exercise or by doing continues throughout the process of professional initiation." 488 Similarly Wittgenstein states, "The child learns by believing the adult. Doubt comes after belief." 489 Unless one is initiated into a paradigm the question of revolting against the paradigm does not arise. How does paradigm initiation take place? Kuhn reacts " 'normal science' means research firmly based upon (one or more past scientific achievements) achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice. Today such achievements are recounted -- by science text-books elementary and advanced." 490 The initiation into the community thus takes place

489. OC 160. 490. SSR p. 10.
with the help of text-books. Text-books and teachers help in the process of initiation.

Wittgenstein states his views on the text-book tradition thus, "In general I take as true what is found in text-books, of geography for example, why? I say: All these facts have been confirmed a hundred times over. But how do I know that? What is my evidence for it? I have a world-picture." Which should I accept what is written in the text-books? I accept it, because I have a world-picture and text-books are part of that world-picture.

"The child", says Wittgenstein, "learns to react, in such-and-such a way: and in reacting it doesn't so far know anything. Knowing only begins at a later level." That is to say, the initiation is so smooth and begins so early that the realisation of being in a particular scientific tradition comes much later.

I began writing this section out of historical curiosity and would like to end it with Kuhn's view on the relationship between history and science. Commenting on Whitehead's views Kuhn remarks, "Whitehead caught the unhistorical spirit of the scientific community when he wrote. "A science that hesitates to forget its founders is lost." Yet he was not quite right, for the sciences, like other professional enterprises do need their heroes and do preserve their names. Fortunately instead

491. OC 162. 492. Ibid., 538.
of forgetting these heroes, scientists have been able to forget or revise their works."\textsuperscript{493} Kuhn has not revised Wittgenstein's work, but he has also not forgotten it. Though a sheer coincidence the structure of his SSR does coincide with some aspects of Wittgenstein's $\text{OC}$. 

\textsuperscript{493} SSR pp. 138-139.