CHAPTER IV

THE INDUCTIVE JUSTIFICATION
OF INDUCTION

The inductivists are not satisfied with an `analytic justification of induction'; because it does not give any assurance that induction will often lead to success. Inductivists argue that induction is a reliable guide for our expectations because it has worked well so far. This type of justification is called inductive justification of induction because it holds that the argument from `induction has worked in the past' to `induction will work in the future' is a correct inductive inference.

Hume claims that inductive justification of induction is circular because induction is relied upon in order to prove that induction is reliable. The proponents of inductive justification of induction point out that it is not circular in the ordinary sense because its conclusion is not one of the premisses from which the conclusion is derived. Actually an inductive justification of induction is circular in the sense that the conclusion asserts the correctness of the rule of inference by which it is reached. The Inductivists claim that this kind of circularity is not vicious and it does not spoil the cogency of an argument.

Inductive justification of induction was first explicitly proposed by C. S. Peirce; later R. B. Braithwaite and Max Black have both championed this view. They maintain that induction could be inductively justified instead of being deductively justified by confirming to a rule or a standard of induction. The reason for accepting the inductive conclusion is that it has proved successful in the past, for example, we accept the conclusion "All men are mortal" on the basis that men have been proved mortal in the past. The inductivists say that there is a good reason why we should trust the inductive conclusion in question.

C. S. Peirce considers induction as a trustworthy method for pursuing truth due to its being a self-correcting process. He holds that in the case of inductions (synthetic inference) as distinguished from deduction (analytic inference) "We only know the degree of trustworthiness of our proceedings. As all knowledge comes from synthetic inference, we must equally infer that all human certainty consists merely in our knowing that the processes by which our knowledge has been derived are such as must generally have led to true conclusions".[1] This type of argument amounts to an inductive justification of induction.

Peirce asserts that if induction is valid at all, its validity must consist in the fact that "it pursues a method which, if duly persisted must, in the very nature of things lead

to a result indefinitely approximating to truth in the long run".[2]

But here the question may arise as to how induction must in the long run lead to truth. Peirce may reply that induction is a method which always corrects its errors and leads us in reaching the true conclusion. Thus he argues "The true guarantee of the validity of induction is that it is a method of reaching conclusion, which if it be persisted in long enough, will assuredly correct any error concerning future experience into which it may temporarily lead us".[3]

Peirce in his last writings asserts self-corrective tendency of induction as the heart and essence of inductive method. Induction is self-corrective if its conclusions are correlated by other such conclusion. One inductive conclusion corrects another if we reject one in favour of the other, because the sample on which the first conclusion based is larger than the sample on which the second conclusion is based.

Peirce concludes that ".........the method of induction must generally aproximate to the truth; that is a sufficient justification for the use of the method, although no probability attaches to the inductive conclusion".[4] Peirce's account of trustworthiness of inductive inference as the criterion of its validity makes inductive validity on the basis of some objective

fact about the principle, according to which the inference is made. Braithwaite objects that "...........to make this dependence a dependence upon the proportion of inference covered by the policy which lead to true conclusion is to put it in a form which is, in two ways badly suited for our purpose. In the first place, since the conclusion of an induction is a general hypothesis, there is no time at which it is conclusively proved. The hypothesis may, of course, be established by the induction, but its establishment at one time will not prevent its refutation at a later time if contrary evidence occurs".[5]

Braithwaite considers that an inductive policy could be expected to be objective in the future if it has the character of being effective-in-the-past. In this sense the inductive principles, that whenever known members of a class are found to possess a certain character, it is probable that all members of the class possess that character is a valid one, if it has proved to be true and successful in most cases in the past.

Our inductive conclusions are to be considered as valid in accordance with the principle of Induction. But as soon as the objection that there is no logical reason for accepting this rule as a valid one is raised, this principle must be justified by itself in the sense that most of its applications in specific cases have been successful in the past. Braithwaite has proposed this way of justifying induction.

He believes that induction is not a demonstrative form of inference like deduction. Here he uses the word `Induction' in the sense in which it covers the inferences of an empirical generalization from its instances or of a scientific hypothesis from empirical evidences for it. Braithwaite asserts that belief in the premisses by itself does not generate belief in the conclusion and the reasonableness of belief in inductive conclusion requires fulfilment of more conditions than that of reasonable belief in the premisses. It is also necessary that the conclusion is derived in accordance with a (valid) principle of inference. If in the inference one is aware of the validity of the principle besides having reasonable belief in the premisses, then the inference may be said to be subjectively valid. And if the conclusion is drawn from reasonably believed premisses without awareness of the valid principle of inference, then the inference is said to be objectively valid.

Braithwaite starts his considerations of justification of induction by saying that "all the inductions whose validity we wish to establish are inferences in which the inductive conclusion has been derived from the empirical premisses in accordance with one or the other of a limited number of inductive principles of inference".[6] He claims that "the justification for an inductive inference from known empirical data, i.e. the criterion for the `validity' of the inference and for the `reasonableness' of belief in the hypothesis which is the

conclusion of the induction, lies in the principle in accordance with which the inference is made being one of the policy of using which has a charateristic, which I shall call "predictive reliability" and which C. S. Peirce once called "truth producing vitrue".[7]

According to Braithwaite, the justification of induction consists in the fact that a policy of passing accoring to an inductive principle from true beliefs to beliefs-in-general hypothesis frequently enables us to accept hypothesis which are confirmed and unrefuted by experience.

Braithwaite begins his argument by defining an inductive policy as a policy "for establishing general hypothesis in accordance with inductive principles of inference on the basis of empirical data".[8]

He suggests the following criterion for the "reliability" of an inductive policy II and for the validity of any inference, reasonableness of belief in any hypothesis it sanctions. (Inductive policy II is represented by a greek capital letter which denotes only the simple enumerative inductive policy).

"Of every time t later than a fixed time t_o, and of every interval of time of a fixed length of years, d lying within the interval (t_o,t), it is true that many of the hypotheses

established by the use of policy II during the interval of $\underline{d}$ years (unless there is no such hypotheses) have the joint property (1) of not having been empirically refuted at any time between the time of establishment and $\underline{t}$, (2) of having been empirically confirmed atleast once between the time of establishment and $\underline{t}$".[9]

The important point is that for a policy II to be reliable it must have what Peirce called "truth producing virtue". Following his explication of this Peircean notion, Braithwaite defines an effective policy as one shich satisfies the criterion of reliability, and an effectiveness in the past policy as one which satisfies the criterion which results when "of every time $\underline{t}$ not later that the present time and substituted in the above for, of every time $\underline{t}$". He assumes that "the effectiveness of an inductive policy is an empirical proposition which does not logically follow from the policy's effectiveness in the past".[10]

Braithwaite tries to show that non-circularity (in the vicious sense) of the following argument `A' justifying the use of the policy of simple enumeration. Argument `A': (1) Policy II is effective in the past.

Therefore:

(2) Policy II is effective. Braithwaite considers that an argument A obviously does not have among its premisses

proposition (2) and accordingly is not circular "in the _petitio_ _principii_ sense of professing to infer a conclusion from a set of premisses, one of which is the conclusion itself". Braithwaite himself concedes that by this observation it is difficult to get rid from the charge of circularity. "Still there is the difficulty involved in the use of an inferential policy to establish its own effectiveness".[11] To overcome this dificulty Braithwaite proceeds to argue that argument `A' is reasonably believed and the argument will be both valid and exempt from the charge of circularity if any of the following conditions are fulfilled.

I - `Policy II is effective' is merely believed (and not reasonably believed) or

II - `Policy II is effective' is true.

III - It is both believed (though not reasonably believed) and true.

Braithwaite uses the word `valid' and `validity' in the sense that "the conclusion can justifiably be added to the inferer's body of reasonable beliefs".[12] Braithwaite says that all that is required for inferential validity in addition to the reasonable belief in the premisses of the argument is the truth of the proposition asserting the effectiveness of the principle governing the inference.

Braithwaite says that the person making the inference can be regarded simply as a reasoning machine. He says, "there is nothing objectionable in the machine arriving at a new proposition which corresponds to having a reasonable belief in a proposition asserting some general property of the method of working of machine".[13]

Braithwaite gives an analogy between `machine' and `human being'. A machine could be constructed in such a way that when "fed" certain propositions it would arrive at the proposition that its "principle of working" was effective. There is nothing objectionable in the conception of such an occurence. Man, like machine, can thus arrive from premisses to conclusion automatically. But human beings are unlike machines. A man can believe or disbelieve or doubt; machines cannot. One feature of this disimilarity is the human ability to question the status of belief inferred from reasonably believed premisses by principle of inference whose effectiveness is not similarly reasonably believed.

After developing the machine analogy Braithwaite writes "But if the machine becomes self conscious and critical of its mode of working, it will not be satisfied with a criterion for the validity of inference which depends upon the effectiveness in fact of the method by which it is working but will demand a condition either as an alternative or as an addition, which

states its belief in this effectiveness".[14]

He claims that it is sufficient for the validity of an inductive argument that the inference have reasonable belief in the premisses of the argument together with belief, though not reasonable belief, in the effectiveness of the principle of inference employed.

It is argued that belief in the proposition `e' that a certain inferential `policy II is effective' is "self-rationalizing, not of course in the sense that believing e makes this belief itself reasonable, but in the sense that believing e carries along with it a belief that this belief in e is reasonable".[15] Braithwaite gives an argument as follows: From these premisses:

(1) B reasonably believes the Policy II - evidence for e

(2) B believes e

(3) e is true. This conclusion can be drawn that it is both subjectively and objectively reasonable for B to believe e.

Braithwaite asserts that B has a reasonable belief in e, where e is a proposition asserting the effectiveness of using the principle. But the question arises that how can B arrive at a reasonable belief in e. Neither B arrives at a reasonable belief in e by direct observation nor indirectly because the criterion

of effectiveness refers to all time t later than ${}^t\underline{o}$, and hence also the future times. Therefore $\underline{e}$ is a contingent proposition. Consequently his reasonable belief in $\underline{e}$ depends on the use of the inductive principle of inference.

Braithwaite tries to escape from this circularity by the following analysis. He asserts that the circularity resides in presupposing that B must have a reasonable belief in $\underline{e}$ in order to arrive at a reasonable belief in $\underline{e}$. But does the validity of B's inference depend upon this presupposition ? According to Braithwaite there are three possible fundamental criteria for judging whether B's use of the inductive principle of inference is valid.

(1) B believes $\underline{e}$

(2) B has a reasonable belief in $\underline{e}$

(3) $\underline{e}$ is true.

Braithwaite accepts that if B has a reasonable belief in $\underline{e}$ is the only acceptable criterion for validity, the inductive derivation of a reasonable belief in $\underline{e}$ would be circular. He claims that (1) `B believes $\underline{e}$' by itself establishes the "subjective validity" of B's use of the inductive principles of inference. (2) `$\underline{e}$ is true' by itself establishes the `objective validity' of his use of the principle. (3) The premiss `B

believes e' and the conclusion `e is true' together establish the subjective and objective validity of his use of the principle. The subjective validity and objective validity is a justification for B to make inference in conformity with the inductive principle of inference. Neither subjective nor objective validity assume that `B has a reasonable belief in e'. Thus Braithwaite claims that there is no circularity in his use of the inductive principle of inference in reaching at a reasonable belief in e.

Abner Shimony refutes the above treatment of induction. He says "Prof. Braithwaite has gained no advantage by performing inductions in terms of rules of inference rather than in terms of supressed premisses, for an argument using a non-deductive principle of inference makes exactly the same assumptions as a corresponding argument in which the principle of inference is deductive but premisses are suitably strenghtened".[16]

Braithwaite's attempts to avoid the circularity is refuted by Abner Shimony. He argues in the same article that the "subjective validity" of B's use of the inductive principle of inference does not make it reasonable for him to infer according to this principle, for his belief in its effectiveness may be ungrounded. Nor does "objective validity" make it reasonable for B to use the principle, unless he also knows or reasonably believes that it is objectively valid; otherwise the

correctness of his mode of inferring is merely a lucky guess. Finally, since both components are of so little help it is hard to see how the combination of "subjective and objective validity" can make B's use of the inductive principle of inference reasonable".[17]

Although Braithwaite's arguments are powerful, yet we should still have a good reason for hesitating to accept his conclusion. In fact Braithwaite was unable to avoid the charge of circularity which is involved in inductive principle.

Max Black has been the staunchest supporter of the non-circularity of inductive justification of induction. According to him, to construct an inductive argument, supporting a principle of induction which avoids circularity, depends on the distinciton between a premiss of an inference and a rule in accordance with which one infers. Many philosophers believe that there is a circulatiry in this assumption that what has already worked will continue to do so uses an inductive rule. Max Black claims that the appearance of circularity arises only from overhasty application of criteria applicable to deduction.

Max Black wants to establish the conclusion that `all inductive arguments are to be conducted according to one and the same inductive rule'. An inductive argument in support of that rule might be correct. He believes that conjunction of the

premisses and the negation of the conclusion is not self-contradictory. According to him this follows from the meaning of inductive argument that an inductive argument is not a special kind of deductive argument. Deductive arguments either establish their conclusion or they do not. On the other hand, an inductive argument may offer stronger or weaker reason in support of its conclusion. Black assumes that there is only one supreme inductive rule or principle which determines all correct inductive arguments and has to be shown to be true or probable. He formulates an example of self-supporting inductive argument. He believes that such self supporting-inferences may satisfy the conditions for legitimate inductive inference. The example is as follows:

"R_1: To argue from all examined instances of `A's have been B 'to `all A's are B'.

R_2: To argue from: `most instance of A's examined in a wide variety of condition have been B' to `(probably) the next A to be encountered will be B'"

Further he says that we can formulate two inductive arguments for the support of rule R_1 and R_2 respectively.

"(a_1) All examined instances of the use of R_1 in arguments with true premisses have been instances in which R_1 has been

successful.

Hence

All instances of the use of R_1 in the argument with true premisses are instances in which R_1 is successful".

Black gives another argument in support of R_2 "(a_2) In most instances of the case of R_2 in arguments with true premisses examined in a wide variety of conditions, R_2 has been successful.

Hence (probably)

In the next instances to be encountered of the use of R_2 is an argument with true premisses R_2 will be successful".[18]

The argument a_1 is governed by R_1 and a_2 by R_2 (In Black's `Self Supporting Inductive Argument(a_2) is called (a) and R_2 is called (R).)

Max Black calls (a_1) argument the first order argument and (a_2) the second order argument. According to him the word `probably' here indicates the `variability of strength' of these arguments. He claims that this argument cannot be circular since its conclusion is not one of its premisses, or even hidden in one of its premisses. The conclusion does not follow deductively from the premisses. Though this would not be good for a deductive argument but it saves our inductive argument from

circularity.   The   argument   may   also   be   "Correct   without
triviality".

        Max   Black   argues   that   `Variability   in   strength'   is
important   for   inductive   arguments.   By   the   help   of   this   we   can
distinguish   inductive   argument   from   deductive   ones.   A   deductive
rule is   either valid or invalid but in   inductive rule `degree   of
reliability'   depends   upon   its   ratio   of   success   it   assumes   in
previous   applications.   Black   says that   the   measure   of   the
strength   of   an   argument   is   m/n;   that   is,   relative   frequency   of
the   successful   applications   of   the   argument   with   true   premisses.

        "Suppose   evidence   is   available   that   4/5   of   the   A's   so   far
examined   have   been   B,   and   it   is   proposed   by   an   application   of   the
rule   R,   to   draw   the   inference   that   the   next   A   to   be   encountered
will   be   B.   Suppose   for   the   sake   of   argument   we   know   R   to   have
been   successful   in   9/10   of   the   cases   in   which   it   has   been
previously   used.   If   so,   the   second   order   argument   affirms   with
strength   9/10   that   R   will   be   successful   in   the   next   instance   of
its   use.   Thus   there   is   a   transfer   of   the   strength   from   the
second order argument to   the first order argument".[19]

        Black   claims   that   "Inductive   argument   governed   by   R   vary
in   strength   according   to   the   number   and   variety   of   favoured
instances   reported   in   the   premisses.................".[20]

In arguing that the second order argument (a$_2$) supports the rule R$_2$, Black is claiming that the strength of the argument raises the degree of reliability of the rule.

Black attempts to show that if all goes well inductive method becomes self-regulating and self-supporting. According to him "If we have no reason to think that R is unsuccessful most of the time, or is objectionable on some logical grounds, that is enough to make our employment of it so far reasonable. The function of higher order arguments in the tangled web of inductive method is to permit us to progress from relatively imprecise and uncritical methods to methods whose degrees of reliability and limits of applicability have themselves been checked by inductive investigations".[21]

W. C. Salmon in the end of his article "Should we Attempt to Justify Induction" refutes Black's arguments. He says, "The so called self-supporting argument are...............circular in the following precice sense: the conclusiveness of the argument cannot be established without assuming the truth of the conclusion. It happens, in this case, that, the assumption of the truth of the conclusion is required to establish the correctness of the rules of inference used rather than the truth of the premisses, but that makes the argument no less viciously circular. The circularity lies in regarding the facts stated in the premisses as evidence for the conclusion, rather than as

evidence against the conclusion or as no evidence either positive or negative. To regard the fact in the premisses as evidence for the conclusion is to assume that the rule of inference used in the argument is a correct one. And this is precisely what is to be proved. If the conclusion is denied then the facts stated in the premisses are no longer evidence for the conclusion".[22]

Black argues that Salmon's views are improper because `conclusiveness' can be used for deductive argument but not for an inductive argument. An inductive argument may be correct or incorrect. Black claims that Salmon is making a mistake by saying that the falsity of (a)'s conclusion entails the incorrectness of the rule by which (a) is governed. Black further argues that "He (Salmon) would be plainly wrong if he maintained that an assertion of the correctness of (a) was an additional premiss required by (a), or that an argument to the effect that (a) was correct must precede the legitimate use of (a). For if this last demand were pressed it would render deductive inference no less than inductive inference logically impossible. If we were never entitled to use a correct rule of inference before we had formally argued in support of that rule, the process of inference could never get started".[23]

He claims that if there is such a thing as inductive correctness and if its instances can be experienced before then there are cirteria of inductive correctness which can be found as

vindicated. According to Salmon, it is a gross mistake to say that "a given inductive rule can be established by a self-supporting argument". According to Black "if `established' means the same as `proved reliable', the self-supporting argument can strengthen the rule and in this way `support' it".[24]

Peter Achinstein also gives two objections to the cogency of Black's argument. First he gives a counter-example and considers the rule of inference D: "Argue from `No F is G': and "Some G is H' to the conclusion `All F is H'".

Now the `self-supporting' argument (b) can be formulated as follows:

"premiss: No argument using D as its rule of inference is an argument which contains a premiss beginning with the term `All'; some arguments containing premisses beginning with the term `All' are valid.

Conclusion: All argument using D as their rule of inference are valid".[25]

Here in the self-supporting argument (b) neither its conclusion is the same as premisses nor it is presupposed by them. There is a similarity of structure. In the inductive case we know that the rule of inference is good, that is we have "subjected it to scrutiny" and so on, but in the above case we

know that the rule of inference is not good.

Achinstein's other argument is more effective; it is that
"............to claim that a non-deductive rule of inference is
correct or valid is to imply.........that it will probably be
successful in the next instance of its use". If we call the
self supporting inductive argument (a), ".......the assumption
that (a) is valid........does involve the claim that (a)'s
conclusion is probable".[26]

According to Achinstein this makes (a) circular. He says
that in using the argument (a) to show that its conclusion is
probable one must assume that its rule of inference is correct.
And this involves the assumption that its conclusion is probable
and thus there is a cirularity.

Black maintains that the conclusion of (a) is that `R
will be successful in its next application' and this is very
different from the assumption that `R will probably be
successful'.

Achinstein is not satisfied with Black's argument. He
argues that what possible ground there can be for accepting the
conclusion of the argument ? He assumes that the only ground
which can be given is that R is probably a generally successful
rule. Black points out that R will probably be successful does

not entail that it will be successful on its next application. But Achinstein says that R's probable success provides the ground for accepting the conclusion of the argument (a). According to him there is a circularity. We cannot know the adequacy, the correctness of the rule of inference in accordance with which we construct the argument, without "simultaneously or antecedently".

Bredo C. Johnson also refutes Black's thesis. According to him it is impossible that the strength of an argument is completely independent of the degree of reliability of its rule. In fact their independence is essential to Black's argument; otherwise he could be committed to the view that one must take the rules of degree of reliability into account in determinig the strength of an argument. But that having done so one can redetermine it with a different result by applying to the rules of the degree or reliability.

Further Johnson argues that "if the possiblity of an inductive justification of induction depends on the possiblity of increasing the strength of inductive arguments by means of second level arguments making use of the same inductive rule, then the former possiblity does not exist".[27]

In this way inductive justification of induction is not able to dispose of the problem of induction. It also does not go to the roots of the philosophical perplexities. This inductive

justification of induction does not lead to any new solution or dissolution of the problem of justifying the inference. There are many problems in Inductivist's argument. However, they are useful in pin-pointing some difficulties in the justification of induction.