**Russell's Conception of Critical Thinking: Its Scope and Limits**

Paul Hager

University of Technology, Sydney

**Introduction**

Recent work by Hare (1998) has highlighted the extent to which there is a rich conception of critical thinking contained in Russell's writings. One of the implications of Russell's account of critical thinking is that we need to take a critical stance to critical thinking itself. This paper aims to contribute to such a critical understanding by examining the scope and limits of Russell's conception. While Russell intended his conception of critical thinking to be widely applicable, it should not be assumed that the resources of critical thinking are all of the thinking needed

in particular situations. This will be illustrated by considering a series of thinking

situations that were particularly important for Russell. In each case Russellian

critical thinking will be seen to be but part of the required thinking resources. Thus some limitations of Russellian critical thinking will be identified, limitations that can be traced to the epistemological and ethical underpinnings of critical thinking being insufficient to the particular circumstances.

**Russell's Conception of Critical Thinking**

While Russell did not employ the term 'critical thinking' as such, he did offer accounts of the various components of the thinking that comprises what he called the 'critical outlook', a stance which he vigorously endorsed. Russell's detailed accounts of the components of the critical outlook focus closely on what has since come to be called 'critical thinking'. However, though Russell's views on critical thinking are very detailed, they ".... are scattered throughout numerous writings, never systematized into a comprehensive account" (Hare 1998, p. 1). As Hare1 has argued, Russell's conception of critical thinking embraces a wide range of skills, dispositions and attitudes. Together, these "characterize a virtue which has both intellectual and moral aspects, and which serves to prevent the emergence of numerous vices, including dogmatism and prejudice" (1998, p. 2).

Major skills components of Russell's conception of critical thinking include:

• the ability to form an opinion for oneself

• the ability to find an impartial solution

• the ability to identify and question assumptions

• the ability to marshal evidence

1 The following summary account of the skills, dispositions and attitudes that comprise Russell's conception of critical thinking is derived almost entirely from Hare 1998. In connecting Russell's many thoughts on the critical outlook to contemporary work on critical thinking, Hare has made a substantial contribution to Russell scholarship.

Hare (1998, p. 3) stresses that Russell views the application of these skills as anything but routine or formulaic. Instead, they require the exercise of sound judgment. That is, they are always sensitive to the details of the particular case.

The formation of contextual judgments of this kind will be facilitated by the judger exhibiting relevant dispositions. Major dispositions (or 'habits' and 'readinesses') that are crucial to Russell's conception of critical thinking include:

• the habit of impartial inquiry

• the habit of weighing evidence

• the habit of attempting to see things truly

• the habit of independence or self-direction

Because these habits are significantly intellectual and not simply automatic responses, they require a multifaceted personal willingness, which Russell calls

'readiness'. The kinds of required readinesses include:

• a readiness to admit new evidence against previous beliefs

• a readiness to discard hypotheses which have proved inadequate

• a readiness to adapt oneself to the facts of the world

Russell summed up the personal willingness described here as 'having the virtue of truthfulness'.

According to Russell, critical thinking requires that the skills and dispositions set out above be complemented by certain attitudes. These attitudes that complete Russell's conception of critical thinking include:

• a realization of human fallibility

• an open-minded outlook

• a refusal to think that our own desires and wishes provide a key to understanding the world

• being tentative

These, then, are the major skills, dispositions and attitudes that Hare has identified

as fundamental to Russell's conception of critical thinking. Overall, this conception is based on an epistemological and ethical outlook which emphasises that:

• beliefs are not to be held dogmatically

• all beliefs are doubtful

• knowledge is difficult to attain but not impossible

• freedom of opinion is to be encouraged

• truthfulness is to be revered

• tolerance is to be promoted

**The Scope of Russellian Critical Thinking**

According to Hare, the

"..... ideal of critical thinking is, for Russell, embedded in the fabric of philosophy, science, rationality, liberalism and education, and his views emerge as he discusses these and other themes." (1998, p. 2)

Hare, following Russell's lead, characterises the chief attitudinal component of this conception of critical thinking as "critical undogmatic receptiveness" (1998, p. 5). Reflecting the embedding of the ideal of critical thinking in Russell's diverse areas of interest - as captured in the above quotation - critical undogmatic receptiveness is variously explicated as "the true attitude of science", "the scientific outlook", "the scientific spirit", "the scientific temper", "a scientific habit of mind", "the philosophic spirit", "a philosophical habit of mind", "the liberal outlook", and "the rational temper". Obviously, then, the scope of Russell's conception of critical thinking is

very wide. There are few, if any, areas of human endeavour where such attitudes have no place at all.

However, as Hare (1998, p. 9) points out, this does not commit Russell to any simplistic notions about the generalisability of critical thinking. For instance, having the habit of weighing evidence is, by itself, ineffectual without some knowledge of what evidence is relevant to the particular situation. So, though the scope of Russell's conception of critical thinking is far reaching, its application in particular circumstances will usually require some relatively local knowledge and/or know how. This is not so much a limitation on Russellian critical thinking as a proper understanding of what is needed for it to be effective. However the next section considers some possible limitations of Russellian critical thinking, limitations that can be traced to the epistemological and ethical underpinnings being insufficient to the particular circumstances.

**Some Limitations of Russellian Critical Thinking**

I RUSSELLIAN CRITICAL THINKING IS NOT A SUFFICIENT IDEAL TO LIVE BY

Given the significant ethical outlook that figures in Russell's ideal of critical thinking, including distinctive values and attitudes, the question arises as to whether this is enough to live by? The answer appears to be "no it is not". One way of supporting this conclusion is to consider Russell's own estimate of the virtues that he would

wish to possess (Russell 1930). The idea is to compare one ideal (the ten virtues that

Russell wishes humankind to possess) with the ideal of critical thinking as outlined above.

Russell's proposed virtues, expressed as 'Ten Commandments' are: I - Do not lie to yourself.

II - Do not lie to other people unless they are exercising tyrrany.

III - When you think it is your duty to inflict pain, scrutinise your reasons closely. IV - When you desire power, examine yourself closely as to why you desire it.

V - When you have power, use it to build up people, not to constrict them.

VI - Do not attempt to live without vanity, since this is impossible, but choose the right audience from which to seek admiration.

VII - Do not think of yourself as a separate wholly self-contained unit.

VIII - Be reliable. IX - Be just.

X - Be good-natured.

What the comparison reveals is that some of these ten virtues match and strongly support some components of Russellian critical thinking (e.g. I), and some are at least consistent with components of Russellian critical thinking (e.g. VII). However others, perhaps most, of these virtues can be seen as covering significant ethical matters that lie outside of the ethical content of Russell's ideal of critical thinking. Hence the conclusion that the ideal of critical thinking is not enough to live by. Although I will not pursue the matter further here, one wonders whether some of the reported difficulties experienced by Russell's family, such as being expected to

be independent at too young an age (see, e.g. Tait 1975), might not be traceable to an

overreliance on the ideal of critical thinking as a guide to living one's life.

II RUSSELLIAN CRITICAL THINKING IS NOT SUFFICIENT AS A PHILOSOPHICAL METHOD

This section and the next address the question of whether the skills and dispositions that are fundamental to Russell's conception of critical thinking are sufficient for thinking in general? Once again, the answer appears to be "no they are not". In order to demonstrate this, we first need to consider some distinctions that Russell himself made within various groups of his own writings and then understand why, for Russell, philosophical analysis was something more than mere critical thinking.

Russell's social, political and educational writings are the major source of his account of critical thinking, as a scan of the sources of the quotations in Hare (1998) confirms. These social, political and educational writings are also *prima facie* instances of Russellian critical thinking in action. Certainly they often have been praised as models of critical thinking. Yet Russell himself frequently and vigorously denied

that these writings were philosophical in any serious sense. For instance, in his 1940 submission in the New York 'Chair of Indecency' case, in which his social writings, including those on education, were cited in evidence against him, Russell testified as follows:

"....the petition is based on a misunderstanding of the word 'philosophy' (which I know is often taken by ignorant people to mean theories for the conduct of practical life).....The books and opinions mentioned are no part of my philosophy and cannot be correctly described as philosophy at all."2

2Quoted in B. Feinberg and R. Kasrils (1973) *Bertrand Russell's America, Vol. 1: 1896-1945*. London: Allen and Unwin, p. 159.

Likewise Russell asserted that *Principles of Social Reconstruction*, a major example of his social and political thought, was not written in his capacity as a philosopher (Slater 1976, p. 138). Elsewhere Russell stated that he had "....always maintained that there was no logical connection.....between my views on social questions and my views on logic and epistemology." (1944, p. 727). He pointed to the example of Hume, with whom he agreed so largely in abstract matters, yet disagreed with so totally in politics. Not surprisingly, then, in *My Philosophical Development*, a detailed

account of the evolution of his work as a philosopher over a period of seventy years,

no mention is made of his social, political and educational writings. At best, Russell tells us, any connection between his philosophical and social/political writings is psychological (1972, p. 10).3 By this he means that the same general critical spirit, the basing of beliefs on evidence, being open to various viewpoints, etc. is exhibited in both. That is, while critical thinking is evident in both, the philosophical work requires something more.

Passmore has concluded that a reading of Russell's works supports these assertions of a dichotomy between his philosophical and his social, political and educational writings. As evidence of the dichotomy, Passmore (1980, p. 4) points out that:

"In the preface to *On Education* he made it clear that he was writing as a parent to parents, not as a philosopher to philosophers. Whereas in *Our Knowledge of the External World* he had argued that the philosopher should avoid large untested generalisations and should remember that advocacy is no part of his task, his *On Education* abounds in large generalisations and is through-and-through advocacy. It is in no sense an application of Russell's general philosophical views to the special field of education. One could not possibly guess, reading *On Education*, that Russell was at that time committed to the philosophy of logical atomism."

Passmore further observes that Russell provides a "striking example" of an expert philosopher having written about education when what he had to say has "....not been at all philosophical, in the professional sense of that word." As Hare (1987, p.

25) points out, other philosophers including Ayer, Perry and Park have shared this

judgment.

So the case for denying that Russell's social, political and educational writings were a part of his philosophical work looks to be a strong one. Despite this, some writers, most notably Hare (1987) and Woodhouse (1985, 1987, 1992), have argued that Russell was a major philosopher of education. Hare because he believes that, firstly, Russell made an important contribution to our understanding of the fundamental difference between education and indoctrination, and, secondly, that he formulated and defended a conception of teaching appropriate to the ideal of education. It is, of course, possible that Russell's writings on education might make a contribution to philosophy of education even though he regarded them as something other than philosophy. However, Woodhouse goes further and claims that Russell "applied the

3 See also Slater (1976), pp. 138, 153-154.

same method of scientific philosophy in his educational thought as he did in his philosophical writings." (1987, p. 176). If we interpret this as meaning that the same critical thinking or critical spirit is evident in both cases, we can agree with Woodhouse. However, if we read this as referring to Russell's philosophical method, we have to dissent from Woodhouse, since it is precisely in the application of a specific method beyond critical thinking that Russell's philosophical writings differ from his social, political and educational writings.

Certainly Russell's conception of critical thinking is generally applicable to thinking in philosophy. Russell asserts

".... philosophy is merely the attempt to answer ... ultimate questions, not carelessly and dogmatically, as we do in ordinary life and even in the

sciences, but critically, after exploring all that makes such questions puzzling,

and after realizing all the vagueness and confusion that underlie our ordinary ideas." (Russell 1912, p. 7)

However the difference is that when it comes to philosophical thinking Russell has a distinctive method, a method which, though underpinned by critical thinking, goes substantially beyond it. Russell deployed this distinctive method of philosophical analysis right across his career, with the beginnings of it being evident in his idealist phase. The major feature of this method of philosophical analysis is that it has two stages that move in opposite directions. The first stage moves backwards from a given body of knowledge (the 'results') to identify its likely premisses. The second, forwards, stage returns from these premisses to a reconstructed body of knowledge that differs in important ways from the original body of knowledge. While philosophical analysis as such was constituted by the two stages taken together, Russell, somewhat confusingly, sometimes called the first stage "analysis", and the second stage "synthesis". This was because he regarded the first stage as being the most philosophical, the second stage being essentially deductive.4

The premisses reached by moving backwards from a given body of knowledge in the first stage of analysis consist not only of propositions, but also concepts or ideas, which are primitive at one level of analysis and defined at the next level down. Consider, for instance, Peano's analysis of natural number theory via three primitive concepts and five primitive propositions. Peano's work strongly influenced Russell's revolt against idealism and the accompanying refinement of his philosophical method. Peano's three concepts and five propositions are for Russell the premisses. Of course, in the strict sense of the term 'premisses', only the five primitive propositions are premisses. However, Russell's inclusion of the concepts (0, number and successor) amongst the premisses is fairly innocuous since these are used to define further premisses (e.g. "1 is the successor of 0"). As Russell saw it, in the next breakthrough in philosophical analysis, due to Frege, these concepts ceased to be

4 It is beyond the scope of this paper to make good the claim that Russell consistently adhered to this view of philosophical analysis across his career. For detailed arguments for this see Hager (1994 and 2001).

primitive (e.g., Frege provided a definition of number). This wide inclusive sense of

'premisses' is typically employed by Russell in his descriptions of philosophical analysis.

This example illustrates one important feature of Russellian philosophical analysis, that it is *unlikely to be final*. This is so in two senses. Firstly, analysis is never final in that new premisses may always be discovered in relation to which existing premisses are results:

"[We] have no reason to suppose that it is impossible to find simpler ideas and axioms by means of which those with which we start could be defined and demonstrated." (Whitehead and Russell 1910, Vol. i, p. vi)

Thus, for Peano natural number theory constituted the results, while the three primitive concepts and five primitive propositions were its premisses. But the latter then became the results for Frege, whose analysis produced new premisses. In principle, this process might continue indefinitely. Russell used a geographical metaphors to describe this situation: as the frontiers are pushed back, yesterday's premisses become tomorrow's results from which a new generation of philosophers will start the backwards journey of analysis. This view locates philosophy at the frontiers of the particular exact sciences. As the frontier is extended, territory that once belonged to philosophy becomes exact enough to be incorporated into science. Thus "every advance in knowledge robs philosophy of some problems which formerly it had...." (Russell 1919, p. 141) It remains for philosophy to move to the new frontier.

As well, Russell repeatedly emphasised that these further stages of analysis in no way invalidate earlier ones. This is because no error will flow from taking complex objects to be simple at one level of analysis, as long as it is not assumed that such objects are incapable of further analysis. Thus, for example, "... points may be defined as classes of events, but that does not falsify anything in traditional geometry, which treated points as simples." (Russell 1948, p. 269).

But there is a second sense in which analysis is never final. This relates to the ever present possibility of alternative sets of premisses being devised for the same results. To ask what are the minimum premisses for a given set of results "is a technical question and it has no unique answer" (Russell 1959, p. 162). Hence a major task of philosophical analysis is to devise alternative sets of premisses. Russell's critical thinking skills, dispositions and attitudes, such as being open-minded and tentative about knowledge claims, are very clearly pertinent to both of these senses in which philosophical analysis is unlikely to be final. However in both cases they are being applied to the support of specific philosophical skills that are not themselves part of the general characterisation of critical thinking.

Another major feature of Russell's method of philosophical analysis, one that takes it well beyond his conception of critical thinking, is that the premisses established by

analysis are likely very *far from being self-evident*. In fact, according to Russell, as the frontiers are repeatedly pushed back, the sets of premisses become decreasingly

self-evident. Russell's definition of number provides an example of the premisses

being far from self-evident. A "number is anything which is the number of some class", where the "number of a class is the class of all those classes that are similar to

it" (Russell 1919, pp. 18-19) is clearly a less self-evident definition than that from a more primitive knowledge era where "a number is any of 1,2,3,4 ........etc." This means that for Russell, the premisses are usually much less obvious than some of their consequences, and are believed precisely because of their consequences. This is also why the second (forwards) stage of philosophical analysis is likely to yield new understandings not contained in the original results. Since the premisses feature novel and surprising aspects, when a replacement set of reconstructed results is deduced from them, knowledge not contained in the earlier results is likely. Hence the (later) synthesis stage of Russellian philosophical analysis is just as important to the whole as the (earlier) analysis stage.

This feature of Russellian analysis is at odds with some common interpretations of his work that view him as seeking certain or self-evident foundations for knowledge. Let us consider this point in a little more detail. The following table (taken from Hager 1994, p. 22) catalogues the multitude of ways that Russell describes the results and premisses in his accounts of analysis:

*Results (or Data) Premisses* More complex Simpler Relatively concrete Abstract Common knowledge

Vague Precise

Logically interdependent Logically independent More obvious Less obvious Undeniable

Inexact and approximate Definite Indubitable Dubitable Puzzling

Confused Clear

Self-evident

Ambiguous

At first glance it may seem puzzling that though the results (as compared with the premisses) are "self-evident", "undeniable" and "indubitable", they are also "inexact", "vague" and "confused". But Russell produces some striking examples to show that there is no inconsistency here: the something approaching us through a thick fog is undeniably (indubitably) some object or other though we have only a vague (confused, inexact) idea of just *what* it is (Russell 1959, pp. 98-99). Likewise the

novice hearing a symphony might be impressed by the parts evidently (indubitably)

forming a whole, yet be very vague (confused) about how the parts relate to one

another to constitute the whole (Russell 1959, pp. 169-170).

The characteristics of results and premisses listed in the table above also clarify an ambiguity in Russell's use of of the term 'simple'. The premisses are *simple* in the primary sense that the results can be *compounded* from them. However, as the Oxford dictionary confirms, 'simple' also means 'easily understood', i.e., the *results* could

also be seen as simple in that they are concrete, common knowledge, obvious and indubitable. Russell appears to have been using the term in this second sense in his vintage claim that

"the point of philosophy is to start with something so simple as not to seem worth stating, and to end up with something so paradoxical that no one will believe it". (Russell 1918, p. 172)

So the second major feature of Russell's method of philosophical analysis, that the premisses established by analysis are likely very far from being self-evident, takes us well beyond his conception of critical thinking. Overall, this account of his philosophical method has shown that his characteristic open-mindedness about the finality or otherwise of his philosophical views at any given stage is attributable to much more than just a conception of critical thinking. To engage in philosophical thinking in the way recommended by Russell is to do something much more circumscribed than merely thinking critically.

III RUSSELLIAN CRITICAL THINKING IS NOT SUFFICIENT FOR SCIENTIFIC METHOD

Philosophical method is not the only area of thinking where the skills and dispositions of critical thinking are insufficient according to Russell. This section argues that the same is so for scientific thinking. Despite some confusion to the contrary, which Russell unwittingly encouraged at times, he sees scientific thinking as different in significant ways from both critical thinking and philosophical thinking. However, some aspects of his writings encourage the reader to view philosophical analysis and scientific method as being of a kind.

Firstly, it was not unknown for Russell to refer to his method of philosophical analysis as a 'scientific method in philosophy' or as a 'method of scientific philosophising' (see, e.g. the title of Russell 1914). Secondly, Russell saw the frontiers between science and philosophy as somewhat blurred5. This might be taken to suggest that he viewed their methods as blurred as well. But any such inference is erroneous, as will be demonstrated shortly.

A third reason why Russell's method of philosophical analysis might be confused with scientific method is his frequent use of certain examples as illustrations of particular points about analysis. For instance whenever he is discussing the

non-finality of analysis, Russell often uses examples like water (e.g. Russell (1959),

pp. 169-70). His point is that when you learn that water is two parts hydrogen and

5 For discussion of this see Hager 2001.

one part oxygen, you do not cease thereby to know anything that you previously knew about water. While this type of example is useful for making particular points about analysis, it should not be inferred that the analysis of water into hydrogen and oxygen was inspired by Russell's method of philosophical analysis. Rather, that feat was achieved by quite other means. Interestingly, when strongly influenced by G. E. Moore in the early years of his revolt against idealism, Russell had regarded analysis of propositions as akin to chemical decomposition. This line of thought can be found in W. E. Johnson, Husserl, Meinong and other writers of that era. However, in Russell's case, rapid advances in his philosophical position, such as the theory of descriptions, quickly disposed of any lingering tendency to entertain a naive realist view of propositions.

Despite these apparent indications to the contrary, Russell insisted that philosophical analysis and scientific method were two different kinds of thinking.6

This is evident from his strong reaction to an article by McKinney (1957) that claimed he denied the distinction. Recognising the two-directional nature of Russellian philosophical analysis, McKinney equated the first stage (analysis) with scientific hypothesis formation, and the second stage (synthesis) with deduction from scientific laws and theories. In a 1958 letter7 Russell bluntly rejected this interpretation by distinguishing sharply between the first stage of his method ("analysis") and science's inference to things not perceived, i.e. scientific hypothesis formation, a form of non-deductive, or non-demonstrative inference.

In the 1958 letter, Russell expanded on the difference as follows: in philosophical analysis the "whole is given", in scientific hypothesising the "whole is not given". His point here is that the data or results that are the starting point for philosophical analysis are very different from the data that play a central part in scientific method. In philosophical analysis the "whole is given" in that there is no question of the data being expanded indefinitely, as happens in science, where further observations are made or experiments conducted. Since, for Russell, philosophical analysis is a conceptual activity all that it requires is an understanding of the present state of the field being investigated. This characteristic feature of the data for philosophical analysis, that it is already freely available, is reflected in some of the kinds of characteristics of 'results' (or 'data') noted earlier in this paper, i.e. 'relatively concrete', 'common knowledge', 'more obvious', 'undeniable', 'indubitable' and

'self-evident', while also 'inexact and approximate', 'confused' and 'ambiguous'. By contrast, Russell views scientific hypothesising as essentially dependent on testing

6 An early indication that Russell was well aware of the differences between science and philosophy is provided by the enormous impression that Einstein's relativity theories made on him. Responding in 1929 to a questionnaire from a Chicago magazine, he confessed that he "would gladly change places with about a dozen people - but first of all with Einstein" (Clark

1975, p. 428). (Russell warned the magazine that his responses were "truthful rather than interesting"). Earlier in the summer of 1919, on being informed of the results of Eddington's eclipse observations, which coincided with Einstein's predictions, Russell reportedly exclaimed: "To think that I have been spending all these years on muck" (reported in Wood 1957, p.133) These, of course, were the years of *Principia Mathematica*.

7 I am grateful to Nicholas Griffin for drawing this letter to my attention.

by observational data, data that by its nature is always incomplete. In scientific hypothesising, the "whole is not given" because inference to unobserved instances is an unavoidable part of the enterprise.

Russell provides some illustrations of the perennial incompleteness of the data used in scientific hypothesising. One example, discussed in both his 1948 *Human Knowledge* and in the 1958 letter to McKinney, is the inference to Kepler's laws from data consisting of a finite set of planetary positions. Clearly the data here is less than the whole in that it consists of particular positions for particular planets at particular times, a subset of all of the positions of all of the planets at all times. In this case, there is the further complication that while two of the three positional coordinates come from measurements, the third cooordinate is a guess chosen to yield simple laws of planetary motion. Russell points out that it follows from scientific

hypothesising being based on less than the whole data, that scientific hypotheses can

never be *proved* true:

"The hypothesis embodied in Kepler's laws is not *proved* by observation; what observation proves is that the facts are *compatible* with this hypothesis."

(Russell 1948, p. 499)

Another example that Russell discussed in *Human Knowledge* is the law of falling bodies (1948, p. 497). Based on a small number of rough measurements, Galileo hypothesised that the acceleration of vertically falling bodies is approximately constant. Further support for the hypothesis was added when the invention of the air pump enabled measurements in the absence of air resistance. However later observations and theoretical developments suggested slight variations in acceleration with both latitude and altitude. Thus Galileo's simple hypothesis was displaced successively by increasingly more complicated Newtonian and then Einsteinian laws.

From these examples intended to distinguish scientific method from philosophical analysis we start to appreciate Russell's fallibilist understanding of scientific method. Here is his account of a "model of the scientific method":

"Hypothesis and observation alternate; each new hypothesis calls for new observations, and, if it is to be accepted, must fit the facts better than any previous hypothesis. But it always remains possible, if not probable, that some further hypothesis may be called for to explain further observations. New hypotheses do not show old ones to have been false, but only to have been approximations....."

(Russell 1974, pp. 21-22)

By now Russell's sharp contrast between his distinctive method of philosophical analysis and his view of the scientific method, with its alternations of hypothesising and observation, should be clear. Crucial is the difference between two kinds of

'data' - the data that play a central part in Russell's view of the roles of observation

and hypothesis in science, as illustrated in the above examples, and the quite different data that provides the starting point for philosophical analysis.

In his 1958 letter to McKinney, Russell stressed that the contrast between the methods of philosophy and of science should be clear from his 1948 book *Human Knowledge* . Interestingly, the main project of that book is to attempt a philosophical analysis of the nature of scientific inference. In the process Russell's provides a classic illustration of his two-directional method of philosophical analysis. The 'vague', 'inexact and approximate', but 'indubitable', and 'puzzling' result (or data) to be analysed in *Human Knowledge* is the

common claim that 'scientific knowledge is developed from observational data

via inductive or probabilistic inference'. After spending half of the book

clarifying the vague terms in which this data is expressed, Russell is ready, beginning in Part IV, to conduct the backwards step in analysis to identify some premisses of scientific inference. The more 'precise', 'logically independent', and

'dubitable' premisses reached in this case include fundamental concepts like

'causal line' (defined on p. 477), 'space-time structure' (defined on pp. 344ff),

'event' (defined on pp. 97-98), and other basic notions such as 'similarity' and

'series'.

Finally, in Part VI of the book, Russell carries out the forwards (or synthesis) step in the analysis. From the concepts and principles arrived at in the first stage of analysis, he proceeds in the second stage to deduce "five postulates" which are "required to validate scientific method" (Russell 1948, p. 506). These

'reconstructed results', which replace the earlier vague notion of 'inductive or

probabilistic inference' are:

I The postulate of quasi-permanence.

II The postulate of separable causal lines.

III The postulate of spatio-temporal continuity in causal lines.

IV The postulate of the common causal origin of similar structures ranged about a centre, or, more simply, the structural postulate.

V The postulate of analogy.

Russell maintains that while none of these postulates is certain, each has some significant degree of probability. As usual, he recognises the non-finality of his analysis. Pointing out that it is "highly probable" that the number of postulates "can be further reduced", he adds that "I have not myself succeeded in doing so" (Russell

1948, p. 506).

Thus, in*Human Knowledge* Russell offers a philosophical analysis of the premisses of scientific method. But such an analysis is itself an instance of philosophical thinking and definitely not in itself an instance of scientific method.

By now it should be clear why Russell sharply distinguished philosophical method from scientific thinking. We also saw that Russellian critical thinking is not sufficient for his philosophical method. What about his account of scientific thinking? Is

critical thinking sufficient there? Again the answer seems to be "no it is not". While the general outlook represented in Russellian critical thinking appears to be a necessary background for scientific thinking, it seems to be insufficient in that various more specific skills and dispositions are required, e.g., to design, carry out and interpret experiments.8 In general, the components of Russellian critical thinking are too general to provide much guidance about the skills and dispositions needed to generate significant data of a kind that will genuinely test and extend scientific thinking. It may even be that these skills and dispositions vary somewhat across very different domains of science.

III RUSSELLIAN CRITICAL THINKING IS NOT SUFFICIENT FOR CREATIVE THINKING

An altogether different way of describing thinking, which seems to cut across the other sorts of thinking discussed above, is creative thinking. Creative thinking would appear to belong in a different category because all of the kinds of thinking

discussed so far, e.g. philosophical thinking or scientific thinking, can be more or less creative. This has led some writers to propose that creative thinking should be thought of as overlapping critical thinking, while having its own special features

that distinguish it from critical thinking (e.g. Norris and Ennis 1990). Russell would seem to agree broadly with this conclusion as evidenced from the following comments he made on his own creative thinking.

"In all the creative work that I have ever done, what has come first is a problem, a puzzle involving discomfort. Then comes concentrated voluntary thought involving great effort. After this a period without conscious thought and finally a solution involving the complete plan of a book. This last stage is usually sudden ...... and seems to be the important moment for subsequent achievement." (Russell 1949, p. 487)

Russell adds later in the same piece that the "moment of insight is exciting, like quick motoring."

Although this description is brief, and somewhat psychological, it is clear that Russell is offering the beginnings of a skill strategy for creative thinking. The skill strategy relates to matters not dealt with directly in his conception of critical

thinking. Hence, it seems that creative thinking is yet another facet of thinking that is

not fully covered by Russell's conception of critical thinking.

**Conclusion**

8 Interestingly, Ennis, one of the better known contemporary proponents of an abilities and dispositions account of critical thinking (see, e.g., Ennis 1987, 1991a, 1996) has also produced an account of scientific thinking (Ennis 1991b). While this account has significant overlaps with his critical thinking abilities and dispositions, the main differences relate to matters such as experimental design and control, types of acceptable definitions, data collection, and the like.

Russell's conception of critical thinking has a scope and depth that places it favourably alongside more recent work on this topic. This paper has addressed the question of the range of applicability of Russell's conception. While Russellian critical thinking can be seen as underpinning thinking of all kinds, it has been argued that, on Russell's views, important instances of thinking require other resources in addition to those of critical thinking. These instances, as demonstrated by Russell's own writings, include decisions about the conduct of one's life,

philosophical method, scientific method, and creative thought. Thus some necessary

limitations of Russellian critical thinking have been identified, limitations that can be traced to the epistemological and ethical underpinnings of critical thinking being, by themselves, insufficient to all circumstances.

**References**

Clark R. (1975) *The Life of Bertrand Russell*. London: Jonathan Cape and Weidenfeld & Nicholson.

Ennis R. H. (1987) 'A Taxonomy of Critical Thinking Dispositions and Abilities' in J.

Baron & R. Sternberg (eds.) *Teaching Thinking skills: Theory and Practice.* New

York: Freeman.

Ennis R.H. (1991a) 'Critical Thinking: A Streamlined Conception', *Teaching*

*Philosophy*. Vol. 14, pp. 5-24.

Ennis R. (1991b) 'An Elaboration of a Cardinal Goal of Science Instruction: Scientific

Thinking', *Educational Philosophy and Theory*, Vol. 23, No. 1, pp. 31-44. Ennis R.H. (1996) *Critical Thinking*. Upper Saddle River, N. J.: Prentice-Hall.

Hager P. (1994) *Continuity and Change in the Development of Russell's Philosophy*.

Nijhoff International Philosophy Series. Dordrecht/Boston/London: Kluwer

Academic Publishers.

Hager P. (2000) 'Russell' in W. H. Newton-Smith (ed.) *A Companion to the Philosophy of Science*. Oxford: Basil Blackwell, pp. 408-12.

Hager P. (2001) 'Russell's Method of Analysis' in N. Griffin (ed.) *The Cambridge*

*Companion to Russell*. Cambridge: Cambridge University Press (in press).

Hare W. (1987) 'Russell's Contribution to Philosophy of Education', *Russell: Journal of the Bertrand Russell Archives*, n.s. 7,pp. x-y.

Hare W. (1998) 'Bertrand Russell on Critical Thinking', publication details?? McKinney J. P. (1957) 'Philosophical Implications of Logical Analysis', *Hibbert*

*Journal*, Vol. 55, 1956/1957, pp. 249-59.

Norris S.P. and Ennis R.H. (1990) *Evaluating Critical Thinking*. Melbourne: Hawker Brownlow.

Passmore J. (1980) *The Philosophy of Teaching*. London: Duckworth.

Russell B. (1912) *The Problems of Philosophy*. London: Oxford University Press. Russell B. (1914) *Our Knowledge of the External World as a Field for Scientific Method in*

*Philosophy*. (1969 edition). London: Allen & Unwin.

Russell B. (1918) 'The Philosophy of Logical Atomism', *The Philosophy of Logical Atomism and Other Essays: 1914-19, The Collected Papers of Bertrand Russell* Vol. 8, ed. J. Slater, London: Allen & Unwin, 1986, pp. 157--244.

Russell B. (1919) *An Introduction to Mathematical Philosophy*. London: Allen & Unwin. Russell B. (1930) 'My Ten Commandments', *Everyman*, April 3, 1930, pp. 291, 296. Russell B. (1944) 'Reply to Criticisms' in P. A. Schilpp (ed.) *The Philosophy of Bertrand*

*Russell*. Evanston and Chicago: Northwestern University.

Russell B. (1948) *Human Knowledge: Its Scope and Limits*. (1966 printing) London: Allen & Unwin.

Russell B. (1949) 'How To Think Creatively' in K. Blackwell and H. Ruja (1994) *A Bibliography of Bertrand Russell*, Vol. 1, London & New York: Routledge, p. 487.

Russell B. (1958) Letter to J. P. McKinney from Plas Penrhyn dated 18 July. Russell B. (1959) *My Philosophical Development*. (1975 printing) London: Allen &

Unwin.

Russell B. (1972) *My Own Philosophy*. (written in 1946). Hamilton, Ontario: McMaster

University Library Press.

Russell B. (1974) *The Art of Philosophizing and Other Essays*. Totowa, NJ: Littlefield, Adams & Co. (Essays originally published in the 1940s).

Slater J.G. (1976) 'The Political Philosophy of Bertrand Russell' in J. E. Thomas and K.

Blackwell (eds.) *Russell in Review*. Toronto: Samuel Stevens, Hakkert & Co.

Tait K. (1975) *My Father Bertrand Russell*. New York: Harcourt Brace Jovanovich. Whitehead A. N. and Russell B. (1910) *Principia Mathematica*, 3 vols. (1910-13),

Cambridge: Cambridge University Press.

Wood A. (1957) *Bertrand Russell: The Passionate Sceptic*. London: Allen & Unwin.

Woodhouse H. (1985) 'Science as Method: the Conceptual Link Between Russell's Philosophy and His Educational Thought', *Russell: Journal of the Bertrand Russell Archives*, n.s. 5, pp. 150-161.

Woodhouse H. (1987) 'More Than Mere Musings: Russell's Reflections on Education as Philosophy', *Russell: Journal of the Bertrand Russell Archives*, n.s. 7, pp. 176-178.

Woodhouse H. (1992) 'Russell and Whitehead on the Process of Growth in

Education', *Russell: Journal of the Bertrand Russell Archives*, n.s. 12, pp. 135-159.