KARL POPPER'S 3 WORLDS AND SOME CONSIDERATIONS FOR INFORMATION SCIENCE

Paul Leonard Gallina
Canadian Centre for Occupational Health and Safety
250 Main Street East
Hamilton, Ontario L8N 1H6

ABSTRACT

Karl Popper's 3 worlds are seen from his problem situation-- an attempt at an objective hermeneutics. By using and deepening some of the insights of Brookes and Neill on Popper, the author develops some considerations for information science. Its task is to collect and order World 3 artefacts in such a way that they can be accessed by an individual's knowledge structure. This involves studying World 2-World 3 interactions, some examples of which are given.

LES TROIS MONDES DE KARL POPPER ET QUELQUES CONSIDERATIONS POUR LES SCIENCES DE L'INFORMATION

RESUME

Les trois mondes de Karl Popper sont considérés sous l'angle de sa propre problématique -vers une herméneutique objective. En utilisant et en approfondissant quelques idées de Brookes et de Neill sur Popper, l'auteur propose quelques applications pour les sciences de l'information. Sa tâche serait de corriger et d'ordonner les artefacts du Monde 3 de telle façon à ce qu'ils puissent être accessibles à la structure des connaissances de chaque individu. Cela implique l'étude des interactions du Monde 2 et du Monde 3, dont on propose quelques exemples.

KARL POPPER'S 3 WORLDS

With its emphasis on World 3 the ontology of Karl Popper, relative to his other contributions, has received scant attention in the philosophical literature Even so, a recent critical article went as far to suggest that if it survives criticism it will stand as a rather powerful theory about the nature of human culture.(Cohen 1980)

However some significant attention has been given Popper's ontology in the literature of information science where it is seen to be fraught with theoretical significance for the discipline. Witness Bertie Brookes who proclaims, "Popper's World 3 should commend itself to library and information scientists because, for the first time, it offers a rationale for their professional activities which can be expressed in other than purely practical terms."(1980,128) From a Canadian perspective Sam Neill reiterates, "there is a real place for Popper's philosophy in library and information science."(1982,32)

In this light the following will: 1. attempt to present the philosophical context of Popper's ontology which was not unfortunately initiated by the concerns of information science; and, 2. having established this, go on to develop some considerations this ontology has for the discipline, following the path already begun by Brookes and Neill.

In order to easily orient the exposition at hand, it might be remiss not to begin with some distinctions Popper makes in his use of the term 'world', and then go on to distinguish the salient features within each. It is important to note, I think, that when discussing his ontology Popper does not wish the word 'world' or 'universe' to be taken too seriously. (1979,106) Furthermore he guardingly suggests there may be more than three worlds, and that his term 'third world' is a matter of convenience. He is including and going beyond normal usages of the word, so one must not be too hasty to readily fix traditional conceptualizations.

Keeping the above cautionary remarks in mind, Popper's three worlds might look as follows: first is the world of physical objects or physical states-- the common sense notion of the term 'world'; second is the subjective world of states of consciousness, or of mental states, or perhaps behavioral dispositions to act; and third is the world of objective contents of thought,(1979, 107) those which contain logical content readily accessible to others.

Of course this is at variance with either a monist or a dualist position of whatever variety. For instance a dualist philosopher I know thought it preposterous that I would even consider anything other than two worlds. My retort was: is it not important to distinguish between statements which convey mere subjective beliefs or states of emotion, and those which contain objectively available logical content? On a very minimal level, it seems to me that this is the point Popper is trying to get across. As illustrations let us compare two statements which Popper himself gives as examples of World 2 and World 3.

> I know that Fermat's last theorem has not been proved
> but I believe it will be some day.

This is an example of a World 2 statment. Notice that it lacks any objective reference, and that the reasons for holding the position remain solely with the 'knowing' person.

Now examine the following World 3 example:

> Taking account of the present state of metamathematical knowledge, it seems possible that Fermat's last theorem may be undecidable.

The above is a statement which contains more than mere belief, and more specifically it gives the objective reasons, World 3 objects, for holding that belief -- the present state of metamathematical knowledge. In the sense that this logical content is independent of the 'knower' in that it is objectively accessible to anyone who wishes, Popper wants to suggest that not only is this a World 3 object, but that it is also autonomous from World 2.

In order to illustrate this autonomy of World 3, Popper gives two thought experiments which, perhaps surprisingly, involve libraries. Consider Experiment 1(heaven forbid) which is that much of the world is destroyed, including our subjective knowledge of machines and tools and how to use them. But libraries and our capacity to learn survive. Clearly, Popper concludes, the world would soon be able to get going again.

Compare this with thought Experiment 2 wherein machines and our capacity to use them are also destroyed. However in this case the difference is that libraries are also destroyed. In this second case he believes it would be many milennia before civilization as we know it re-emerged. Much of the autonomous World 3 would be destroyed, and with it the objective logical content of civilization which has been accumulating since its beginning.

Now it appears to me that one way of visualizing World 3 is to see it as a massive metaphysical database which contains all humanly hitherto created problems and conjectures -- in some sense the logical content of all human culture which has been given articulation. It is by no means uniform, and would contain logical contradictions, a difficulty for any analytic philosopher.

However to criticize World 3 from this perspective and argue, as does Cohen,(1980) for the impossibility of such a world existing, is to miss the whole point of Popper's discussion even before beginning. Rather it might at least be conjecturally useful to see World 3 more like a universe of discourse which exists at a certain time and place in history, and which is also changing. Seen from this perspective, I think what Popper wants to direct our intention to are the World 3 objects which are at an individual's disposal. Once this narrower perspective, perhaps, of World 3 is grasped then go on to examine what uses are made of this universe of discourse. Concentrate, then, not so much on whether or not World 3 exists as a phenomenon, but instead at least tentatively accept it and examine its possible explanatory power.

Given the above it appears that a major use Popper has in mind for World 3 is a contribution to a theory of understanding or hermeneutics. (1979,162) In short, it is Popper's position that in order to understand the actions of an individual, an examination of his or her manipulation of World 3 objects is indispensable. This theory of understanding would first conjecture what an individual's aims and intentions were, and what his or her beliefs were as to contraints on how this problem might be solved. It would then appraise the appropriateness of the individual's actions to the situation(Settle, in press). It is revealing to see how this approach applies to Popper himself concerning his theory formulation of World 3.

Throughout nearly all his work, Popper's aims and intentions have been: elucidating the logic of scientific discovery, or in other words how science goes about doing its business; and the concomitant growth of scientific knowledge. He reveals this intimate relationship between science and objective knowledge in the following:

> All work in science is work directed towards the growth of objective knowledge. We are workers who are adding to the growth of objective knowledge as masons work in a cathedral. Our work is fallible, like all human work. We constantly make mistakes, and there are objective standards of which we may fall short--standards of truth, content, validity, and others.(1972,121)

Moreover, it is Popper's belief that scientific discovery is not something completely determined in either a physical, behavioristic, psychologistic, or economic sense. As his essay "Clouds and Clocks" (1979,206-255) suggests, his position is somewhere between a universe governed by chance or contingency, and one which is completely determined. Popper maintains that if complete determinism were in fact the case, Compton in his Freedom of Man gives the following dilemma which we would find ourselves in: "What difference can it make how great the effort if our actions are already determined by mechanical laws...?" (Popper 1979,217)

It is precisely Popper's point that in a universe not completely determined, human rationality can and does make a difference. In science, in particular, Popper considers it centrally important to rationally examine and criticize existing theories against objective standards, and when they fall short, propose alternatives. And it is exactly this self-conscious ability of human beings which determinists wish to deny.

In a synoptic form the Popperian model for the growth of objective knowledge in science is as follows: $P_1 \rightarrow TT \rightarrow EE \rightarrow P_2$. It is a pattern from an immediate grasp of a problem P_1, to tentative theory, through error elimination, to P_2, or the first critical perspective -- in effect a new problem (1979, 144).

One might now wish to ask: Popper's objective hermeneutics is fine in theory, but tell me how does it work out in practice? Give me an example. One which Popper himself gives in order to illustrate the

explanatory power of using World 3 objects is Galileo's refusal to accept the theory of lunar influences on tides. He points out: 1. Galileo, as a forerunner of the Enlightenment, neglected the lunar influences because he associated it with astrology which he opposed, since it identified planets with the gods; and, 2. he worked with a mechanical conservation principle for rotary motion and this appeared to exclude planetary influences.

Here are two World 3 objects, theories, within Galileo's universe of discourse, which were most probably utilized by him to obtain this albeit incorrect conclusion. The upshot of Popper's approach is that rather than seek explantions for Galileo by attempting to determine inaccessible subjective mental states, which are also amenable to a determinist interpretation -- ambition, jealousy, economic necessity, or aggressiveness -- attention instead be drawn to World 3 objects which were indispensable for Galileo's in his decision making process, and which later generations have definite access to: ie in books that one knows he read, positions other reported he held, diaries he kept, and the like. In Galileo's case Popper wants to argue that World 3 interpretations hold greater explanatory power than do World 2 interpretations.

However as one might suspect, this World 3 approach to hermeneutics is not the mainstream approach currently employed, as he explains:

> This, it appears, is a radical departure from the fundamental dogma accepted by all students of the humanities (as the term indicates), and especially by those who are interested in the problem of understanding. I mean of course the dogma that the objects of our understanding belong mainly to the second world, or that they are at any rate to explained in psychological terms.(1979,162).

Popper's criticism of too much emphasis being placed on World 2 explanations is extended to philosophy as well. It is his opinion that the approach of philosophy is often misguided and contributes very little to the epistemic concerns of science. The dualist or belief philosophers (Berkeley, Locke, Russell, et al.) are mainly concerned with trying to rationally justify true belief. Much of these discussions are nonsense for Popper since he is a fallibilist, and it is critical preference which counts, not true belief. Regarding sense data, here, too, classical epistemology barks up the wrong tree, so to speak, since it "fails to take account of the fact that the alleged data are in fact adaptive reactions, and therefore interpretations which incorporate theories and prejudices . . ." (1979,145) Again Popper wants to see a shift of emphasis away from examining World 2 subjective mental states to World 3 objects -- theories, interpretations, and the like.

Now that an attempt has been made to delineate Popper's 3 worlds, and his reasons for doing so, the question at hand is: how does this relate to information science?

Indeed an interesting place to begin might be to look at Brookes' (1980, 131) fundamental equation between information and knowledge:

$$K[s] + \Delta I = K[s + \Delta s]$$

The above graphically represents that the knowledge structure K[s] is changed to a modified structure K[s + Δs] as a result of the addition of Δ I, information. Information, if my reading of Brookes is correct, can be either a World 1, World 2 or World 3 artefact. Within this equation using a Popperian modification, where our focus as information scientists is, and should be, is the ordering of World 3 artefacts so as to make them accessible to K[s] states. In some analagous sense, just as engineers facilitate the ordering and building of World 1, information science is interested in ordering and facilitating further constructions of World 3.

As Neill (1982, 35) claims, there are great similarities between the equation cited above, and Popper's $P_1 \rightarrow TT \rightarrow EE \rightarrow P_2$ cited here earlier. In each of these stages it is important to realize Popper's central thesis which is:

> that any intellectually significant analysis of the activity of understanding has mostly, if not entirely, to proceed by analysing our handling of third world structural units and tools.(1979, 166)

Moreover, this problem solving and understanding process is akin to a Darwinian approach to selection(1979, 144). Remember Popper's complete title for his opus-- Objective knowledge: an evolutionary approach. Here the emphasis should be on the latter. However the conclusion drawn from this has not been made explicit by either Brookes or Neill; that is, by ordering and making World 3 artefacts accessible, information scientists are making a very significant and creative contribution to the nothing other than the evolutionary process itself. How much better will humanity be when understanding rests in objective knowledge rather than in subjective sentiment.

As one can see the practical task of information science, to collect and organize for use the records of World 3, is replete with significance. To further conclude with Brookes(1980,129), central to this practical task is an understanding of the interaction between Worlds 2 and 3. It is to two examples of this that the discussion will now turn.

It seems to me crucial that information scientists realize that World 3 is not equally accessible to all since it is accessed in part through subjective World 2 processes. The specific location of World 3 may be uniform, however the spatial location of World 2 in multiform, in each individual consciousness. Given this irregular nature of World 2, it might be useful for the designer of information systems to first come to grips with the various logical and objective contents (World 3 objects) of the system, and then think of the manifest ways that this could be described through various perceptual and linguistic means.

For instance if an article or book deals with objective knowledge concerning cancer, once this is determined, the information system has to then account for the various ways this objective knowledge could be subjectively described -- malignancy, tumor, neoplasm, illness, and the like.

This is a process which has undoubtedly been going on for some time, but I see the chief advantage of Popper is to provide the possibility for making this process explicit, and giving it a framework. Once the various subjective filters, if you will, through which objective knowledge could possibly be obtained are made more explicit, a major problematic for putting elements in an information system has been accomplished. Ignoring the problem of physical storing (World 1), the essential process of human subject to document, is a primarily a movement from World 2 to World 3. It seems to me that it is in some sense an analysis information seeking behavior, or in other words a disposition to act which Popper clearly identifies with the subjective realm.

A second approach to moving from World 2 to World 3, which I think might be helpful for information science to explore, is what Michael Polanyi refers to as tacit knowing. Popper tells us that processes of understanding are subjective, personal or psychological which must be distinguished from the final act of interpretation, which may also be a World 3 object (1979, 162-163). It is describing this process that Polanyi seems to be most useful.

To present a very condensed formulation of Polanyi's(1967) approach, he argues that we very often know more than we are able to tell or make explicit. This seems to me to be a common everyday occurrence. An example is the person who says: "I know exactly what the problem is, but I cannot explain it". It appears to me that this is a type of intuitive knowing. Also such a state is certainly mental, and I doubt whether it belongs anywhere other than World 2. However, after repeated questions from a second individual as to what this mental state might be, the individual who is in a tacit state of knowing is often able to formulate the problem and make it explicit -- a World 3 object. Therewith the transition from World 2 to World 3 has been completed. An intuitive understanding has been objectified and is then amnenable to rational criticism.

One way of analyzing this process of questioning and discussion which takes place, in examples such as the one above, is to see it as an attempt by the questioning individual to ascertain or guess at the logical content which the tacit knower has not yet made explicit, so that both can reach a state of understanding. The conversation might go like this: "Is this the problem (World 3 artefact) which you are thinking of?" "No it is rather like this" "Oh, then, what you really mean is this" "Yes, that is it exactly". This is a process akin to dialectics, in a Platonic sense, and does in fact give access to World 3. This is something Popper seems to be hesitant to admit(1979, 123). Whereas he most willingly admits that argument is a World 3 object (perhaps the most significant), he is unwilling to admit that it also gives us access to World 3 and that this involves, too, a World 2 process.

How often does an information scientist (or reference librarian) hear, "I know what I am looking for if I could only find it". The

query negotiation which then takes place is an attempt by the information scientist to make explicit his or her patron's tacit state of knowing, make it explicit, and then try to respond to the information need with the objective knowledge in documents which are available.

During this process it is also necessary for an individual to attempt to understand the ability of the patron to access the objective content which may be available. Obviously any logical content is not going to be suitable to answer a question concerning, say, the current state of cancer research. For instance, a fifteen year old is not going to be able to access the same level of objective knowledge as a physician.

To summarize, then, the information scientist has to keep in mind that objective knowledge is received within a partially subjective knowledge structure. It is his or her task to first ascertain the problems at hand, and then match up to ability of a document(the physical embodiment of World 3 artefacts) to convey its logical content with the ability of the subjective individual to receive it.

In the future information systems will have to be designed to correspond to the various levels of the objective knowledge of the user. Here again making such a process explicit within a slightly modified Popperian framework would be most useful, and undoubtedly lead to other problems.

To conclude, it seems to me that although Popper had a theory of objective hermeneutics in mind when developing his 3 World ontology, there are nevertheless significant considerations for information science which flow from it. Whether my conjectural(as Popper would have it) discussion of this fact has made a good contribution to World 3, I leave the reader to decide.

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