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WHY ROZENZWEIG-STYLE MIDRASHIC APPROACH MAKES RATIONAL SENSE: A LOGICAL (SPINOZA-LIKE) EXPLANATION OF A SEEMINGLY NON-LOGICAL APPROACH

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Abstract

A 20 century German Jewish philosopher Franz Rosenzweig promoted a new approach to knowledge, an approach in which in addition to logical reasoning, coming up with stories with imagined additional details is also important. This approach is known as *midrashic* since it is similar to the use of similar stories – known as *midrashes* – in Judaism. While stories can make the material interesting, traditionally, such stories are not viewed as a serious part of scientific discovery. In this paper, we show that this seemingly non-logical approach can actually be explained in logical terms and thus, makes perfect rational sense.

1   Formulation of the Problem

A new approach to knowlegde promoted by F. Rosenzweig.   A 20 century German Jewish philosopher Franz Rosenzweig promoted a new approach to knowledge; see, e.g., [4, 5, 6]. In this approach, in addition to traditional logical reasoning, it is also considered to be very important to come up with detailed stories in which the known details are supplemented by invented additional details.

This approach is known as midrashic.   This approach is known as *midrashic*, after the Judaic notion of a *midrash*.

In general, traditional Judaism follows a logic-style approach, where the objective is to derive rules and regulations concerning appropriate behavior from the statements presented in the Bible and in the accepted oral teachings.

However, in addition to this logical approach, in traditional Judaism, an important role is played by *midrashes*. A midrash is a description of some event (usually, a Biblical event), a description that supplements the (often scant) Biblical details with imagined additional ones.

Problem.   Stories are definitely useful in *popularization* of science, but are they useful for *science itself*? For example, a good historical novel can attract people's attention to history and help them better understand and remember various features of different historic events, but such novels are not normally considered to be important for the *science* of history.

What we show.   In this paper, we show that Rosenzweig's seemingly non-logical midrashic approach can actually makes rational sense from the logical viewpoint as well.

Comment.   In this sense, a seemingly *non-logical* approach promoted by Franz Rosenzweig is actually in good accordance with the *logical* approach – a somewhat exaggerated example of which was promoted by a 17th century philosopher Baruch Spinoza, who, in his *Ethics*, tried to logically derived all the facts and recommendations about human behavior; see, e.g., [7, 8].

2   An Explanation

General idea.   In this section, we show that while Rosenzweig's approach may seem quite different from the usual practice of science, appropriate rephrasings of this approach show that it is actually quite in line with the usual practices.

Logical analogy: logical derivation vs. building models. In the logical approach, we start with the axioms and the rules of logical deduction, and we try to find out what can be deduced from the given axioms by using the given rules of deduction. This is how mathematicians work: we prove theorems and disprove conjectures.

In addition to this, however, logicians and mathematicians also design logical *models* of the existing systems of axioms, models which supplement *known* details (i.e., axioms) with additional features – features which are not necessarily derivable from these axioms (and are, therefore, not necessarily true in all the models); see, e.g., [2].

When reformulated in these terms, this looks exactly like what the midrashic approach is suggesting.

First motivation for building models: confirming consistency. To better understand the above analogy, let us recall the motivation behind building models in logic and in mathematics.

One of the motivations is to prove *consistency* of the set of axioms (and/or to prove that certain additional properties are consistent with these axioms). For example, a model of non-Euclidean geometry proved that such a geometry is indeed consistent with all the axioms of Euclid except for the V-th postulate (that for every straight line ℓ and for every point p outside this line, there exists no more than one line passing through p which is parallel to ℓ); see, e.g., [1].

Comment. The same motivation can be applied to midrashes in Judaism: they show that the corresponding Biblical events – which are sometimes not very motivated in the text of the Bible – are consistent with normal assumptions about the human (and divine) behavior. Also, for those who want to prove a certain point – e.g., that God is more merciful that it is usually believed, or, vice versa, that God is more vengeful and unforgiving than it is usually thought – appropriate midrashes provide a proof that this point is consistent with all the other accepted knowledge.

A related motivation for building models: disproving hypotheses. A related aspect of building models is *disproving* hypotheses. For example, a long-standing mathematical hypothesis that the V-th postulate of Euclid can be derived from other postulates was disproved by showing that there exists a model (Lobachevsky's geometry) in which all other axioms hold while the V-th postulate does not hold.

Second motivation for building models: trying to guess general properties. It is great when we can prove which properties can be derived from

the given axioms and which cannot, i.e., in logical terms, which properties hold for all the models of the given theory and which properties are not true for some models. In practice, however, we often encounter properties for which we do not know whether these properties can be derived or not.

In such situation, a reasonable idea is to try several possible models. If for one of these models, the analyzed property is false, we get the desired counterexample. On the other hand, if we built several different models, and for all of them, the analyzed property holds, it is natural to formulate a conjecture that this property holds for all the models.

For example, in functional analysis, if a certain property holds for several infinite-dimensional normed vector spaces, it is reasonable to conjecture that this property holds for all such spaces.

This midrash-type activity helps to formulate reasonable conjectures (and to dismiss seemingly possible false conjectures).

Analogy with mathematical physics: finding specific solutions to known equations of physics. In mathematical physics, what we know are equations that describe the corresponding physical phenomena; see, e.g., [3]. Depending on the initial conditions, we may have many different solutions to these equations.

It is important to study the *general* properties of solutions, but it is also useful to study *specific* solutions; these solutions often provide good models for different physical phenomena.

Each specific solution combines both *known* information (i.e., equations) and "invented" details (specific initial conditions), and is, thus, a natural analogue of a midrash.

Analogy with pedagogy: showing examples. When teaching a new material, an instructor, in addition to describing *general* concepts and algorithms, usually presents several *examples* illustrating these concepts and algorithms.

One of the objectives of presenting various examples is that a student can get a general idea of different aspects of the material by observing these different examples. Each example combines the available knowledge (i.e., general concepts and algorithms) with additional ("invented") specific information; in this sense, an example is a natural analogue of a midrash.

Conclusion. We started with a seemingly irrational idea of using invented details and resulting "stories" in our pursuit of new knowledge. At first, this idea may have sounded as contrary to the usual practice of science, but hopefully, by now, the reader is convinced that this idea is actually in good accordance with what scientists usually do – to the extend that this seemingly counter-intuitive idea now sounds absolutely trivial. This was exactly our goal

in this paper – to show that Rosenzweig's seemingly irrational idea is actually perfectly reasonable and perfectly consistent with the practice of science.

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