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Einstein, Idealism, and Nonsense

Dorothy Wrinch on the Elimination of Metaphysics

Oliver Thomas Spinney
o.spinney@ucl.ac.uk
University College London

ABSTRACT

I offer a contribution to studies into the role played by women in the history of analytic philosophy through an examination of the way in which Dorothy Wrinch rejected idealism in the early 1920s. I show that Wrinch viewed certain idealist interpretations of Einsteinian physics as literally not significant, through an application of Russell's notion of 'logical construction' to scientific concepts. I show, though, that Wrinch's view departs from Russell's in certain crucial respects and constitutes an original and radical empiricism rooted in an understanding of scientific language. I briefly compare Wrinch's empiricism with that of the *Aufbau* and show that her rejection of metaphysics pre-dates that of Carnap by several years.

1. Introduction

The role played by women in the history of analytic philosophy is an area of study in which welcome developments have been recently made and to which this article is intended as a contribution.[1] Dorothy Maud Wrinch (1894–1976) is best known for her work in mathematics and theoretical biology, for introducing her teacher in mathematical logic, Bertrand Russell, to his second wife Dora (*née* Black), and for her role in securing a publisher for Ludwig Wittgenstein's *Tractatus Logico-Philosophicus*. Very recently attention has been paid to Wrinch's

[1] See Connell and Janssen-Lauret (2023), and Elkind and Klein (2024) for recent volumes focused on expanding our understanding here.

philosophical contributions on the basis of their own merits.[2] In this article I offer an understanding of Wrinch's approach to idealism which emerges from her application of the Russellian notion of a 'logical construction' to an account she develops in the philosophy of science. I show that according to Wrinch, the concepts employed in mature sciences are logical constructions, and that no metaphysical questions concerning the putative entities for which expressions of those concepts stand may count as literally significant. Wrinch, I argue, employs this understanding to the concept of *mind* in the context of philosophical disputes over the implications of Einstein's theory of relativity to the issue of idealism. Wrinch offers a sophisticated approach to idealism rooted in the logical analysis of scientific language, according to which statements of idealist metaphysics must be construed as specimens of literal nonsense. In Section 2 I describe Wrinch's conception of scientific development, and her view of the changing relationship between science and logic which is partially constitutive of that development. I then show, in Section 3, how Wrinch employed these ideas in her treatment of idealism.

2. Wrinch on Science and Logic

Wrinch gives her view of the relationship between science and logic in 'On the Structure of Scientific Inquiry', delivered to the Aristotelian Society on 6 June 1921. What precedes science, Wrinch says, are "discrete and particular" (1921: 181) empirical observations. These observations are not themselves scientific in character, for what is distinctive of scientific inquiry is the employment of general propositions explicable in class-theoretic terms:[3]

> In science we seek to order the phenomena of the world into classes and subsequently to order these classes among themselves. The elementary stage of science deals with the problem of collecting phenomena together and ordering them in classes as, for example, in the general proposition

[2] See Elkind (2024), Felappi (2021), Felappi (2022), and Senechal (2024). See Senechal (2012) for a fascinating biography of Wrinch from the perspective of a former colleague and friend.

[3] Throughout I will retain the original terminology of 'class(es)' as opposed to the contemporary 'set(s)', though I treat these expressions as synonymous for present purposes.

> as to the dates at which birds begin to sing in the spring. (Wrinch 1921: 182)

The 'elementary' stage of science consists, first, in determining classes of items through the identification of properties which define the classes in question. These classes are then 'ordered', such that the relationship between their defining properties is made perspicuous. The result will be, in the basic case, a sentence of the form 'everything which has the property φ also has the property ψ' (Wrinch 1921: 182). The notion of *ordering* employed by Wrinch here is therefore not obviously related to the notion of *sequence* except metaphorically. The subject matter of a sentence belonging to some given science is not any *particular* observation, but rather the relationship between properties in extension, according to Wrinch. In view of this, she says that,

> The central topic to be discussed in a study of the structure of science at this stage is the nature of the relations between the particular propositions which our experience yields and the general propositions with which science opens. (Wrinch 1921: 182)

The relations between propositions in which particular observations are reported and those expressing relationships between classes are clearly not deductive. What is of central concern in the formulation of scientific theory at "this stage" (Wrinch 1921: 182) is therefore the probability of the general propositions which constitute the theory in question, given the relevant observations, and, crucially, the status of those principles which figure in that probability's calculation. Probability theory raises difficulties of its own, but however sophisticated the treatment of those difficulties,[4] their solution belongs, in Wrinch's view, to an "elementary stage" (Wrinch 1921: 182) of scientific development. It is the stages following this one which interest Wrinch in her article, for it is those stages in which the role of deductive logic is most pronounced.

It is not, in Wrinch's view, any indication of a science's being particularly 'developed' that its practitioners have settled on a number of general propositions the probability of which has been established. The requisite development will only have occurred once the *structure* into which these propositions fit has been identified. A description of

[4] Wrinch engaged at length with these difficulties in Wrinch (1919c) as well as in Wrinch and Jeffreys (1919).

Wrinch's views concerning the notion of structure here will be relevant for a comparison with Carnap given in Section 3. Our having found even a large set of highly probable general propositions does not, according to Wrinch, constitute the development of a science beyond the elementary stage, if the relations between those propositions remain unexamined. Identifying the structure of a science consists, then, in discovering the relations which hold between the relevant general propositions, and this, importantly, is a task which lies squarely in the purview of deductive logic, for those relations are, Wrinch says, logical in character: "it is logic and logic alone which is relevant at this point, if we are building up the structure of science" (Wrinch 1921: 192).

Given some set of general propositions it is a matter of logic which of those propositions do or do not imply the others. Establishing the structure of the relevant propositions consists, according to Wrinch, in identifying as more "fundamental" to the structure those from which others follow:

> Now, we want to avoid logical redundancy in the general propositions which constitute a science. We aim at reducing the number of propositions as much as possible. We want, indeed, to discover which, if any, of the propositions follow logically from any of the others and to retain those which seem more fundamental and reject (as independent results) those which follow from them. In this way we shall build up a structure in the way which is logically the most economical. (Wrinch 1921: 188)

A structure is more "economical" than another to the extent that the general propositions constituting the body of scientific knowledge found in that structure are implied by fewer fundamental propositions. A structure with fewer fundamental propositions than another relative to the same body of general propositions may however be viewed as both simpler and more complex relative to separate criteria. The structure in question is simpler insofar as it contains fewer fundamental propositions, but more complex insofar as the chains of deduction between fundamental propositions and relatively less fundamental ones are longer. It is more desirable that a structure be simple in the former sense than that it avoid relative complexity in the latter, according to Wrinch (1927: 159). Long chains of deduction do not, in and of themselves, count against a selection of propositions as fundamental, for implication is conceived of by Wrinch as being truth-*preserving*.

Here Wrinch makes a distinction between *mere* analogy and 'True Analogy' (Wrinch 1921: 207). The use of mere analogy is "important in science in an elementary stage of development" (Wrinch 1921: 209), and consists in supposing, given e.g., some item a which possesses properties $\varphi_1, \varphi_2, \ldots, \varphi_n$ as well as ψ, and another item b which possesses $\varphi_1, \varphi_2, \ldots, \varphi_n$, that b is also ψ. The process of inference by analogy though is entirely distinct, in Wrinch's view, from the employment of true analogy which occurs at later stages of scientific development. In explanation Wrinch writes,

> The term TRUE ANALOGY may conveniently be used to cover this extremely important process by which we obtain knowledge of one set of phenomena by means of knowledge of a different set of phenomena, through an identity of formal characters in the two cases. (Wrinch 1921: 209)

Two regions of science exhibit a true analogy with one another to the extent that they are unified by identical principles describable in purely formal terms. Here and elsewhere (e.g., Wrinch 1923: 50–51) Wrinch gives examples of identical formal principles in thermodynamics, hydrodynamics, and electrostatics. Our employing, for instance, the 'velocity potential' function nowadays denoted by 'φ' in the context of fluid dynamics may serve to aid in the solution of problems concerning electrostatic fields, though the variables in each case will range over distinct kinds of entity; as Wrinch elsewhere puts it, "the interpretations of the formulae are widely different: the form of the analytical results is practically the same" (Wrinch 1923: 50–51). In 'The Relations of Science and Philosophy' Wrinch (1927: 157) gives as a further example the role played by Planck's constant[5] in illuminating what seem on first inspection unrelated phenomena. Our identifying a true analogy holding across distinct regions signals the development of scientific thought beyond the elementary stage,[6] for unifying sciences through the discovery of formal principles constitutes also the discovery of a structure within which those sciences figure, where the formal principle in question is construed as more fundamental than are the general propositions local to each science in the structure.

[5] Wrinch uses the term 'Quantum of Action' (Wrinch 1927: 157).

[6] See also Wrinch (1923: 51).

Logic may play a further role in scientific development than that of serving to aid in the identification of structure, in Wrinch's view:

> The part played by logic is extremely varied, and is not restricted to the construction of a set of propositions in which no one is logically redundant. In the arrangement and collating of the results of observation and experiment, logic often suggests a more comprehensive statement which covers a whole class of results, but which goes beyond these results, and is not therefore the equivalent of the less compact propositions. . . . To establish the fact that a certain hypothesis accounts for certain physical phenomena is a matter of logic alone. (Wrinch 1921: 191)

While the truth of some general proposition postulated in the light of experimental results is established only inductively, it is a "matter of logic alone" (Wrinch 1921: 191) whether or not such a proposition *could* figure as the correct explanation of those results. In other words, logical analysis aids in the identification of candidate general propositions which are subsequently verified by inductive means, according to Wrinch, for while the relationship between general propositions and putative cases of their instantiation is inductive in the direction of latter to former, it is deductive in the reverse. Identifying a postulated general proposition as adequate involves determining whether or not it implies the relevant experimental results, and making this determination obviously proceeds via deductive logical means. Logic therefore plays an absolutely crucial role in the formulation of scientific theory and facilitates the identification of general propositions which go beyond the results furnished by experiment. The extent to which a theory "goes beyond" (Wrinch 1921: 191) experimental results is the extent to which it implies the truth of empirical claims not included among those results. In this way theories may "inspire further progress" (Wrinch 1921: 191) through their implying consequences which may be subsequently verified by observation. We may then work, as it were, both 'backwards' and 'forwards' from empirical observation to theoretical generalisation and vice versa in order to provide support for the theory in question.

What is important to appreciate for my purposes is Wrinch's conception of the role played by 'physical ideas' in a mature science. We have seen that the general propositions constituting a scientific theory describe relations holding between properties in extension, on Wrinch's view. Physical ideas are, Wrinch says, "short-hand symbols for certain sets of properties" (Wrinch 1921: 201):

> Now every single physical idea by analytical study is shown to stand for a class of properties. What is electricity? That inquiry is not in line with modern physical notions. We describe its behaviour. (Wrinch 1921: 202)

The word 'electricity' is not a name of some *thing*, such that we may ask, of that thing, what *it* is. Rather, we may use the word to construct sentences in which the relationship between certain properties is expressed, and "analytical study" (Wrinch 1921: 202) will reveal the specific properties in question. To say, for instance, that 'electricity travels from the negative terminal of a battery to the positive terminal', is to say that anything possessing certain properties which define the notion of electric current behaves in the relevant way. Relatedly,

> The vitalists ask the question, "What is Life"? and we sometimes come across the questions, "What is Mind"? or "What is Matter"? To accomplish the scientific development of the various subjects we should ask, "What are the properties of Life"? or "How does Matter behave"? (Wrinch 1921: 202)

Scientific development is achieved through the identification of properties definitive of the phenomenon in question, and not in our attempting to inquire after some named entity. Wrinch goes on to say that,

> It is clearness as regards the properties which define the behaviour of Life or Mind which is of vital importance. What they are themselves is best left until a later stage. Enormous progress has been made in physics, and it is still by no means plain in what positive electricity, and thence matter itself consists. . . . [I]ts essential nature has yet to be laid bare. It is the collection of the properties of things which leads to the formation of physical ideas. (Wrinch 1921: 203)

Here Wrinch claims that the development of physics may occur without our having answered the question of what, e.g., electricity *is*, where that question assumes the existence of some nameable entity possessing an essential nature so far undiscovered. Where Wrinch holds that questions of this kind may be shelved for scientific purposes it is implied that answers to those questions will be found, if anywhere, in methods of inquiry which are not directly relevant to the concerns of scientists. Importantly though, Wrinch does not *here* construe such questions as specimens of nonsense, nor does she suggest that answers to those questions will be impossible to supply. By 1922 though Wrinch's position had changed with respect to the status of questions putatively related

to scientific subjects though not admitting of scientific treatment. To see why we must examine her use of the Russellian notion of a *logical construction*.

In 'On Certain Methodological Aspects of the Theory of Relativity' Wrinch develops her conception of physical ideas as short-hand devices employed in the construction of statements concerning the relationships between properties through an analysis of the conception of *space* which emerged with Einstein. We will see, in the following section, that Wrinch generalises the approach to the concept of space here discussed to *all* concepts employed in mature sciences. Wrinch refers to the differences between conceptions offered by Eddington, Einstein, and Weyl, while identifying a fundamental feature of those conceptions common to all three:

> [I]n spite of the fact that the views of these writers differ and there seems to be no way of deciding between them at present, if we eliminate all the parts of the theory about which there is not agreement, there is still something of fundamental importance in their treatment of the notion of Space. In the language of modern logic, they all alike use "Space" as a description. Space in the theory of Relativity is a constructed entity. To say that space is a description involves many consequences. No description can ever be used as a proper name. (Wrinch 1922a: 200)

Russell had, in 1916, taught logic to Wrinch in private tutor sessions,[7] and Wrinch (1917), early in her career, defended his use of 'logical constructions' in the treatment of physics. Wrinch here draws freely from Russell, citing him (and Whitehead) throughout. For an explanation of the notion of a logical construction with which Wrinch was operating in 1922, it is simplest therefore to give Russell's own account:

> Given a set of propositions nominally dealing with the supposed inferred entities, we observe the properties which are required of the supposed entities in order to make these propositions true. By dint of a little logical ingenuity, we then construct some logical function of less hypothetical entities which has the requisite properties. This constructed function we substitute for the supposed inferred entities, and thereby obtain a new and less doubtful interpretation of the body of propositions in question. (Russell 1918a: 122)

Russell had, as is well-known, treated *numbers* as logical constructions, such that sentences expressing claims concerning numbers might be

[7] See Senechal (2024: 243).

translated into equivalent sentences in which no such words as those putatively referring to numbers occur. This translation was first effected by means of the class calculus, though classes were subsequently conceived of by Russell as logical constructions themselves, any reference to which is systematically eliminable through the employment of 'propositional functions'. In *Principia Mathematica* Russell shows how the elimination may be achieved with this formula:

$$f\{\hat{z}\,(\phi\, z)\}.=:\ (\exists\psi):\ \phi x\ .\ \equiv_x\ .\psi!x\ :\ f\{\psi!\hat{z}\}\quad Df.$$

Any statement made to the effect that some class, expressed here by '$\{\hat{z}(\phi z)\}$', is f is equivalent to the statement that there is a propositional function extensionally equivalent to the propositional function defining the relevant class, and that the propositional function asserted to exist is itself f. Talk of classes is exchanged, then, for statements exclusively involving propositional functions. Russell suggests that one reason for thinking this strategy valuable is that hypothetical entities of which we are somewhat doubtful may, by means of the systematic elimination of expressions putatively referring to such entities, be exchanged for commitment to entities of which we are comparatively less doubtful. He says,

> By defining the cardinal number of a given collection as the class of all equally numerous collections, we avoid the necessity of this metaphysical postulate, and thereby remove a needless element of doubt from the philosophy of arithmetic. A similar method, as I have shown elsewhere, can be applied to classes themselves, which need not be supposed to have any metaphysical reality, but can be regarded as symbolically constructed fictions. (Russell 1918a: 122)

The approach is therefore conceived of as delivering epistemic advantages through the achievement of metaphysical economy. To say that some entity is a 'construction' involves, on Russell's position, viewing the entity in question also as a *fiction*. The expression '$\{\hat{z}(\phi z)\}$' does not name an entity, in Russell's view, and the content it contributes to sentences in which occurs may be captured without remainder by sentences which do not include the relevant expression. Upon analysis, we can see that what is contributed by '$\{\hat{z}(\phi z)\}$' is better expressed by means of functional expressions, some of which are extensionally equivalent to the purported class in question. Officially, Russell is agnostic

with respect to the existence of logically constructed entities, but having shown the means by which they may be assembled we no longer have positive reason for including them among our ontological commitments, in his view.

The status of those functional expressions which figure in the right-hand flank of a formula employed in the relevant way is, with respect to Russell, a matter of considerable controversy. It has been claimed (i) that such expressions refer to universal properties of a classical Platonic kind, (ii) that they refer to abstract entities called 'propositional functions' which are distinct from classical Platonic universals, and (iii) that they do not refer but constitute open sentences such that Russellian propositional functions are linguistic rather than extra-linguistic entities.[8] While I cannot settle the interpretive issue here with respect to Russell, it seems clear that for Wrinch the expression 'propositional function' is synonymous with 'property'.[9] We should not though infer from Wrinch's using 'propositional function' and 'property' interchangeably that her use of 'property' commits her to conceiving of properties as either Platonic universals or other metaphysical items. We will see, in the next section, that Wrinch's understanding of 'property' is innocent of any ontological commitment. Below, I shall clarify the way in which Wrinch's notion of a *property* contributes to her empiricist, anti-metaphysical orientation.

We have seen that what is distinctive in Einsteinian and post-Einsteinian treatments of space is, in Wrinch's view, that the word 'space' figures there as a description rather than as a name. Wrinch (1922a: 200 n 1), following Russell, identifies expressions putatively standing for constructed entities with *descriptions*, for expressions of the relevant kind do not name metaphysical postulates but encode classes of properties of which it may be asserted *that* they hold of other items. With respect to space, Wrinch says,

> Now in propositions about space we are talking about sets of properties. By the name "mammal" we mean one set of properties, by the name "space" we mean a certain other specific set. And we may find it convenient to talk about the "space properties" of entities. The final scientific account of space will give propositions to the effect that some

[8] See Linsky (1999, chap. 2), Klement (2004), and Stevens (2005, chap. 3) for further discussion.

[9] See Wrinch (1922a: 203).

> properties by means of which we define certain relations, necessarily entail certain other properties. (Wrinch 1922a: 200, 203)

A statement about *space*, on this view, is more accurately understood as one concerning certain properties which are definitive of something's being spatial. Moreover, it is in Wrinch's view Einsteinian and post-Einsteinian advances which have brought this analysis to light in a particularly clear way. In collaborative work co-authored with Harold Jeffreys, Wrinch and Jeffreys point to these remarks from Einstein's *Relativity: The Special and the General Theory* (1920) as constituting a clear break from traditional conceptions of space *as entity*:

> "The purpose of mechanics is to describe how bodies change their position in space with time." I should load my conscience with grave sins against the sacred spirit of lucidity were I to formulate the aims of mechanics in this way . . .. Let us proceed to disclose these sins. It is not clear what is to be understood here by "position" and "space." . . . what is meant here by motion "in space"? From the considerations in the previous section the answer is self-evident. In the first place, we entirely shun the vague word "space," of which, we must honestly acknowledge, we cannot form the slightest conception, and we replace it by "motion relative to a practically rigid body of reference." (Einstein 1920: 9–10)

Wrinch and Jeffreys consequently suggest that Einstein "appears to regard space, not as a primary entity of Nature, but merely as a conventional construct" (Wrinch and Jeffreys 1921: 808), and claim therefore that Einstein's treatment of space is relevantly similar to that described above.

In 1921 Wrinch had seemed to think that, while not strictly relevant for the purposes of science, and "best left until a later stage" (Wrinch 1921: 203), questions such as 'what is electricity?' were at least sensible. Such questions could not, presumably, be dealt with at all, whether sooner or later, if they were not at least significant. By 1922 though Wrinch took a different view:

> On this view it is evident that to ask, "What is Space" is not significant. We want to investigate what consequences can be deduced from the "space properties" of terms . . . [W]hichever part of the general investigation is being undertaken, not in the case of any of them is it significant to ask, "What is Space". (Wrinch 1922a: 204)

This is a crucial passage. Since the word 'space' does not name an entity it is not significant to ask what *it* is; any attempt at asking the relevant

question involves a failure to understand the way in which the word 'space' contributes to sentences in which it appears. In 1922 Wrinch rejects as not significant the kind of question she had earlier been content to shelve as unnecessary to answer for the purposes of science. We might object that Wrinch's using the word 'significant' here does not license my drawing the strong conclusion that in her view the relevant statements are not literally *sensible*.[10] In defence of my contention I cite Wrinch's close understanding of Russellian terminology. Russell had, as is well known, employed the language of *significance* in his treatment of type-theory, for by means of that theory he sought to render instances of his name-sake paradox literally insignificant and consequently not problematically contradictory. Wrinch makes her understanding explicit in a review article:

> In considering various beliefs, Dr. Mercier points out that some statements are not merely false, but definitely nonsensical and such that the mind will not even consider them. Such are, for example, "Two o'clock is solid," "Limestone reasons downward." . . . The notion of nonsensical as employed by Dr. Mercier is, of course, the same notion as that of "non-significant" which is used in modern logic. (Wrinch 1919a)

Given what Wrinch says here, it is implausible in my view to suppose that she subsequently used 'significant' in a way which does not conform to the usage of those modern logicians to which she refers, without making this clear to the reader. In the next section we shall see how Wrinch applied this understanding of scientific concepts to the question of idealism.

3. Scientific Concepts and Idealism

On 20 February 1922, the Aristotelian Society met to discuss the thesis that

> Einstein's theory is a scientific interpretation of experience based upon the principle of relativity. This principle is in complete accord with the neo-idealist doctrine in philosophy, and in complete disaccord with the fundamental standpoint of every form of neo-realism. (Carr 1922: 123)

[10] My thanks to Wouter Cohen for raising this.

This thesis was proposed and defended by H. W. Carr; the other discussants were T. P. Nunn, A. N. Whitehead, and Wrinch. Carr provides a definition of 'neo-idealism':

> Neo-idealism is the philosophical standpoint that reality in its fundamental and universal meaning is mind or spirit. Mind, in this universal meaning, is not an abstract thing opposed to nature, or an entity with its place among other entities in space and in time, it is concrete experience. . . . (Carr 1922: 124)

The view involves conceiving of reality *as* mind, and therefore constitutes an attempted answer to the question 'what is reality *in itself*?'.[11] Carr distinguishes between neo-idealism and Berkeleyian idealism, for the latter position in his view involves an empirical claim concerning the dependency of certain items upon minds which does not figure in the former approach. He reaches the conclusion that Einsteinian physics is exclusively compatible with (non-Berkeleyian) idealism so conceived chiefly through consideration of the relativity of space-time to the perceptions of an observer. Carr describes Einstein's universe as one consisting of independent observers each contributing separate though reconcilable spatio-temporal perspectives, and says that the theory in question is "in essentials the Leibnizian conception" (Carr 1922: 127).

Nunn and Whitehead each reject Carr's thesis on separate grounds. Nunn argues that Carr misrepresents the available realist views as all depending upon classical mechanics. Whitehead argues that,

> A relative theory of space necessitates that we admit the spaciness of the ultimate substance of nature; and a relative theory of time necessitates that we also admit the time-iness of this substance. Accordingly the ultimate fact of nature must, on this theory, be an event. So far, I agree with Professor Carr. But I cannot see why a realist should choke at having to swallow events. (Whitehead 1922: 130–131)

Carr had argued that reality is constituted, according to Einsteinian physics, by mental processes here referred to by Whitehead as a species of *event*. Whitehead's objection involves suggesting that events might be construed otherwise, and in particular that they might be construed in realist terms. Importantly, for present purposes, neither rejects as

[11] Carr goes on to say that "so far as anything is real, that is, exists, that is, is thing-in-itself, it is a centre of perceptive activity" (Carr 1922: 127).

not literally significant the question of whether Einstein's theory is exclusively compatible with an idealist metaphysics.

In her response to Carr Wrinch emphasises what we have already seen her insist upon, that the concepts employed in science are 'constructions' (Wrinch 1922b: 135). There are, in other words, no *entities* expressed by concept-words but only, as we saw above, collections of properties which those words encode. The generalisations which constitute a given scientific theory do not concern relationships between named entities but rather "correlate properties" (Wrinch 1922b: 135), and it is the correlation of properties which is the chief business of science. The correlation of properties though must be "relevant to the external world" (Wrinch 1922b: 136), and a correlation is so relevant when it implies that empirically observable facts obtain or is made likely by the existence of facts which have already been empirically observed to obtain. Wrinch then says,

> The reality of these facts which form the material of physics is not questioned. They are the reality with which science is concerned and indeed the only reality. And the assertion that these facts are the only reality, leads at once to the view of the concept taken by science. Concepts are employed merely as abstracts to facilitate the arrangement and collation of the particular facts which are themselves the only reality. (Wrinch 1922b: 137)
>
> In psychology, as in other branches of physics, *the sensations are the data from which we start, and progress consists in linking them together*. (Wrinch 1922b: 138, emphasis added)

Here Wrinch's ontological views are stated quite clearly. The empirically observable facts implied by, or which make likely, the theoretical claims of science are, Wrinch says, "the *only* reality" (Wrinch 1922b: 138, emphasis added); the concepts employed in the general propositions of science are *mere* 'abstracts' which serve the useful function of determining empirically observable items and implying similarly observable relationships between those items. Progress in science is found through "linking" these observations together, and not therefore in our discovering supra-empirical facts. It is, moreover, the fact that reality exclusively includes the "material of physics" (Wrinch 1922b: 138) which leads to the view of concepts Wrinch advances. This suggests that it is in Wrinch's view a point of methodology that one's theory concord with the ontological position here described. In other words, Wrinch

does not seek to analyse concept-words in order to establish the fact that empirical material exclusively underpins the use of those words, but rather assumes in advance that empirical material is *the only reality* and *consequently* arrives at the view of concept-words described.

Further examples in which Wrinch expresses her view of scientific concepts can be found in her 1919 article 'Existence', where she draws from then-contemporary psychology in describing "examples of the creating of concepts which merely cloak inductions from particular facts" (Wrinch 1919b: 237). She writes:

> In an embryo science, which has already collected myriads of fact, which have been carefully sorted into groups to be used as the basis for inductions and the construction of concepts, the interpretation of these results generally gives rise to much discussion. ... [Arnold Gessell's] object throughout is to find further correlations between the "life cycle" and the "cycle of mental growth." But it is of the first importance to notice that these high sounding terms represent not some vague idea which is taken as given at the outset of the enquiry and which we are to interpret, but simply and solely the logical sum of the various properties by means of which the multitudes of individual observations of young persons are grouped into general propositions. There is a feast of pleasure for the applied logician in studying the way in which the shufflings and reshufflings of these individual observations are made to yield powerful inductions. ... (Wrinch 1919b: 242)

As a scientific theory advances individual observations are *shuffled* and *reshuffled* into groups by means of "various properties" (Wrinch 1919b: 242). Scientific concepts are "simply and solely the logical sum" (Wrinch 1919b: 242) of these properties. There is evidence here of reduction at *two* levels. Concepts are reduced to properties, which in turn are viewed as mere grouping devices and not as contributing novel entities to be studied by the metaphysician. Two distinct steps are involved in Wrinch's analysis of sentences including such words as 'electricity' and 'space'. First, these words figure not as names but are systematically eliminable by means of the Russellian method described above; and what appear upon their elimination are words expressing properties asserted to hold of empirically observable items. Second, those words which express properties do so *not* through referring to entities themselves but instead through their collating or grouping the observable items in question. Wrinch does not then view either concepts or properties as items in their own right but only 'abstracts' or 'cloaks' useful for

organising our knowledge of *particular* facts and the relations holding between them.

In 'Existence' Wrinch distinguishes between *primary* and *secondary* existence:

> The things which make up the outside world appear to be particulars and facts. Facts therefore have a kind of existence, which we will call "primary existence of facts," ... As far as one can see, this apparatus of particulars and facts is adequate for the building up of empirical knowledge. Thus, we do not postulate existence of the primary kind to any other objects of our thought. We do not assume primary existence for physical objects and points and other non-experienced things. Having considered briefly the crude data given empirically, we have to build up the other objects of thought by means of logical construction. (Wrinch 1919b: 142)

Wrinch here views particulars and facts as constituting the "crude data given empirically" (Wrinch 1919b: 142), and, crucially, denies that things which cannot be experienced may be assumed to possess *primary existence*. In contrast with 'primary existence', *secondary existence* is that kind of existence possessed by those items which are constructed by means of the method described above. Items with secondary and not primary existence are characterised by Wrinch in the following way:

> In this way we *construct* a line. But its existence is not the kind of existence possessed by the sense-data out of which it is constructed. It is of such an ephemeral nature that if one looks closely at propositions in which it occurs, it will disappear and only sense-data will be left. It does not belong to the world of sensation: it cannot be touched or seen. It is not verifiable in sense and has the same kind of existence as the fairies of our childhood, which disappeared when we turned round to look at them more closely. (Wrinch 1919b: 145, emphasis original)

Wrinch again emphasises her empiricist orientation in describing the successful construction of those entities with which science deals as requiring that the items constructed be built only from the resources furnished by experience:

> Certain things are given in experience—sense-particulars of various kinds and facts. We then wish to find other terms, such that in analyzing any proposition in which they occur, they themselves do not occur, *but only the things which are given in experience*. (Wrinch 1919b: 142, emphasis added)

Insofar as something has secondary and not primary existence, it does not exist at all in the sense of 'exist' as ordinarily employed. Rather, such items figure as cognitive conveniences our talk of which may facilitate the practices of mathematics and science:

> The extraordinary success of physics in predicting occurrences of sense-data rather points to the fact that these unexperienceable things such as points and instants have at least a pragmatic function of providing a useful terminology. (Wrinch 1919b: 143)

Things not met with in experience are, Wrinch says, of practical utility insofar as the terminology we used to discuss them allows us to forego much lengthier statements concerning the experiences which alone have primary existence. But in Wrinch's view this practical utility is underscored by an understanding of constructed items as having "the same kind of existence as the fairies of our childhood" (Wrinch 1919b: 142). It is, as I said above, an open question what role, if any, is played by the notion of a *property* in Russell. It is not, by contrast, an open question what is Wrinch's position in this context. What is included in *reality* is discovered through experience, according to Wrinch, and not in attending to the meaningfulness of either those words expressing scientific concepts or those expressing properties discovered through an analysis of such concepts. Neither property-words nor concept-words, therefore, refer to entities conceived of as metaphysical items incapable of being met with in experience. Semantic insights are not, consequently, automatically ontological ones, on this position. I do not think it is too anachronistic to portray Wrinch here as anticipating Quine's[12] rejection of the view that our employment of meaningful attribute-words must commit us to the existence of entities serving as their meanings.

Wrinch says the following, of the concept *mind*:

> To its view that the concept is an abstraction, science will allow no exception. The mind is not in a privileged position, but like other concepts is constructed to facilitate the description of the world and the correlation of facts. . . . [I]t cannot be allowed that the mind is concrete experience (Carr 1922: 124) in any sense in which the assertion would be inconsistent with the abstract character of the concept. It is part of the business of psychology to discover all the factors which are involved in the propositions in which the concept occurs. (Wrinch 1922b: 138)

[12] See e.g., Quine ([1948] 1953: 13).

Carr had claimed, recall, that the 'universal meaning' of mind *is* 'concrete experience'. In giving this account Carr accepts, what Wrinch denies, that we may sensibly ask what the nature of mind is *in itself*. Carr fails, in other words, to appreciate the way in which the word 'mind' is employed in the correlation of properties without thereby naming an entity to which we may sensibly attribute properties of its own. Carr's identification of mind with 'concrete experience' is offered in the service of an explanation as to what reality is in itself, where the explanation offered is in his view 'neo-idealist' in character. Insofar as Wrinch denies that we may sensibly say, of mind, what *it* is, it is also denied that any explanation as to the nature of reality which hinges on providing an account such as Carr's may similarly count as literally significant. This follows from Wrinch's statement, discussed in Section 2 above, that questions of the form 'what *is* X', where 'X' is replaced by a concept-word, are not significant but rather specimens of literal nonsense. According to Wrinch, Einstein's theory of space(time) releases us from the urge to inquire after an entity named 'space', because the spatio-temporal properties encoded in our describing something as, e.g., inhabiting *space*, are made explicit by that theory. Similarly, developments in psychology allow us, in Wrinch's view, to better appreciate those properties encoded in a description of something's, e.g., affecting *the mind*. Having discovered those properties we may dispense with an inquiry into the supposed referent of 'mind' and attend only to the ways in which individual observations are grouped together for classification through the use of property-words. In this sense science is relevant to philosophy, not because metaphysics attains the rigour of science but rather because mature sciences allow us to see clearly how empirical data are grouped by means of property-words themselves encoded by our concepts. Wrinch says,

> It must be mentioned explicitly that the correlation of characters is the most important business of science, for the proposition of relativity and other branches of science can all be reduced to propositions of this kind. . . . But I would like to stress the fact that whatever is said about the subject must be reduced to questions of the correlation of characters, and that *indeed there is no further question of whether relativity uses the notion of "substance or cause underlying experience"*. (Wrinch 1922b: 137, emphasis added)

Wrinch here is extremely clear that scientific claims are reducible to those in which 'characters' are correlated with one another in the way

so far discussed. Vitally, for my purposes, she is also clear that claims *not* so reducible fail to count as legitimate. Carr argues that,

> The classical mechanics laid down as the necessary basis of science the affirmation of an existence independent of sense experience. ... The principle of relativity completely reverses this method. It accepts what were called the appearances as themselves the reality with which science is concerned. ... The principle of relativity therefore rejects in physics the metaphysical principle of materialism which presupposes an objective transcendent cause of experience. (Carr 1922: 125)

Carr identifies in the alleged materialism of classical mechanics commitment to a 'transcendental cause' responsible for ensuring mind-independent reality. Wrinch, though, claims that "there can be no further question" (Wrinch 1922b: 123) as to whether Einsteinian physics involves a commitment to a "substance or cause" (Carr 1922: 123) of the kind described by Carr. In Wrinch's view what cannot be settled through an analysis of the claims employed by science into the groupings of empirical observations is not capable of inquiry *at all*. The metaphysical question asked by Carr is, according to Wrinch, an illegitimate one founded on a misunderstanding of the way in which concepts organise empirical knowledge. It is a consequence of Wrinch's understanding of concepts as 'abstracts' and of the related view that empirically observable facts exclusively constitute reality that there could not be general facts involving a purported relationship between something named 'mind' and other items. Supposing that there could be such a relationship is an integral feature of Carr's idealism. Wrinch therefore rejects as literally insignificant the claims of 'neo-idealism', for the relevant claims are issued in ignorance of the way in which 'mind' contributes to sentences in which it occurs.[13]

[13]Elsewhere Wrinch expresses open contempt for idealist philosophy. In a review of May Sinclair's *A Defence of Idealism* (1917), and with reference in particular to Sinclair's treatment of infinity as it relates to time and space, she says that "It is amusing to see the extraordinary and paradoxical conclusions at which philosophers can arrive when they try to treat mathematical subjects—which of course have a method of their own, adequate to deal with them—with the methods of the idealistic school. ... Who would attempt to boil potatoes with the help of a knowledge of Greek, or to attack the problems of sociology with the apparatus of chemistry?" (Wrinch 1919d: 638). Clearly then Wrinch holds that the method employed by idealist philosophers is radically inappropriate to questions of mathematics, space, and time. A detailed examination though of Wrinch's response to Sinclair will take us too far from the focus of this article.

It might, however, be argued that Wrinch's views here may be read as consistent with the possibility of metaphysical inquiry. Wrinch's comments, according to this objection to my interpretation, do not rule out a commitment to her earlier position, that metaphysical questions into the nature of, e.g., *mind*, are simply not raised by scientific investigations, but that they may be pursued elsewhere.[14] In response I wish to emphasise the fact that Wrinch's 1922 comments are aimed expressly at Carr's idealism, and figure as part of a discussion where "The thesis stated in [Carr's] paper has been submitted to the other writers, who have formulated independently their criticisms of it" (Carr 1922: 123). In other words, Wrinch's comments are given as criticisms of Carr's metaphysical claims, and she expressly cites his view in arguing that "it cannot be allowed that the mind is concrete experience (Wrinch 1922b: 124) *in any sense* in which the assertion would be inconsistent with the abstract character of the concept" (Wrinch 1922b: 138, emphasis added). Wrinch then denies that there can be *any sense* in which one may legitimately inquire after the nature of some entity figuring as the referent of our concept-word 'mind', for such an inquiry involves a failure to understand the semantic contribution of the relevant word to sentences in which it may appear. In my view this remark constitutes strong evidence that Wrinch's aim in 1922 is not merely to separate scientific from metaphysical questions, but to eliminate the latter insofar as their formulation requires the postulation of entities conceived of as the referents of concept words employed also in science. This does though leave it open that concepts which (arguably) do not figure in scientific investigations might be conceived of as expressed by words the referents of which count as metaphysical entities in the relevant sense; Wrinch does not argue against the possibility of metaphysical inquiry into the putative referents of 'goodness', 'will', etc., though neither does she argue for that possibility. In this sense then Wrinch's eliminativist orientation is narrower in application than was, for example, Ayer's famous assault on evaluative, religious, and theoretical philosophical language.[15] For Wrinch it is scientific developments which enable us to grasp with greater clarity the nature of those concepts which find

[14] My thanks to an anonymous reviewer for raising this objection.

[15] See Ayer (1946: chap. 6).

employment in *both* scientific and other contexts; where science is silent though, no special clarity can be achieved by its means.

I will now say something about the historical context within which Wrinch's view must be situated. The first thing to appreciate is that Wrinch's position, while significantly influenced by the works of her teacher Russell, is not a mere application of Russell's views, unchanged, to some philosophical issue. Russell had, at least in 1918,[16] argued for the existence of irreducibly general facts:

> It is clear, I think, that you must admit general facts as distinct from and over and above particular facts. The same thing applies to "All men are mortal". ... Those facts have got to come into the inventory of the world.... (Russell 2010: 71–72)

Wrinch, we have seen, denies that general propositions employed in scientific theories describe irreducibly general facts belonging to reality. In Wrinch's view general propositions of the relevant kind employ concepts which figure merely as 'abstracts' serving as useful devices for determining classes of empirically observable facts. In Russell's (1921) *The Analysis of Mind*[17] he accepts that our understanding of 'general' words need not imply the existence of Platonic universals, for our understanding of such vocabulary may be explained purely through appeal to the entities forming classes determined by the relevant terms. Russell (1921: 228) does though suggest that universals may feature as inferred postulates, while our epistemic relation to those entities remains indirect. Insofar as Wrinch denies the reality of general facts her commitment to a reductive empiricism is more thoroughgoing than is Russell's. One might conject that Wrinch's denying the existence of general facts is owed to Wittgenstein, for such a view had, as is well-known, been advanced in his *Tractatus*.[18] Wittgenstein had argued for a reductive account of generality according to which quantified statements reduce, upon analysis, into truth-functional combinations of statements not including quantifier expressions. Wrinch had read the *Tractatus* manuscript with Russell and Jean Nicod at a summer house in 1919,[19] but the attempt to make sense of Wittgenstein there

[16] Russell's 1918 view concerning this issue constitutes a change from that given in *Principia Mathematica* (Russell and Whitehead 1910–1913: 46).

[17] I mention this work in particular due to its contemporaneity with Wrinch's (1922b).

[18] See Wittgenstein (1961: 5.52).

[19] See Russell (2001: 195).

was reportedly unsuccessful.[20] I do not think, therefore, that we can plausibly attribute to Wittgenstein an influence upon Wrinch viz., the rejection of irreducibly general facts.

In *The Analysis of Mind*, moreover, Russell adopts a very different approach to the question of idealism than does Wrinch in the articles I have discussed. Russell there frames his investigation in the following terms:

> The stuff of which the world of our experience is composed is, in my belief, neither mind nor matter, but something more primitive than either. Both mind and matter seem to be composite, and the stuff of which they are compounded lies in a sense between the two, in a sense above them both, like a common ancestor. As regards matter, I have set forth my reasons for this view on former occasions, and I shall not now repeat them. But the question of mind is more difficult, and it is this question that I propose to discuss in these lectures. (Russell 1921: 10–11)

Russell subsequently endorses a 'neutral monism', according to which "Our world is to be constructed out of what the American realists call 'neutral entities' " (Russell 1921: 36). Clearly then, Russell does not consider the metaphysical question of the world's ultimate constitution as a spurious one in *The Analysis of Mind*. He rejects traditional answers to the relevant problem but he does not, unlike Wrinch, view that problem as *dissolving* upon analysis. It might be argued, however, that Russell was not a 'monolytic thinker',[21] and that we may not therefore assume that since he adopted metaphysical positions in certain contexts he did not view metaphysics with suspicion in others. I take this point, but hold that insofar as Russell did anywhere adopt a definite position on metaphysical questions of the kind rejected by Wrinch, they to that extent count as pursuing distinct philosophical approaches.

Neither was the logical empiricist movement an influence upon Wrinch's position in 1922,[22] for the ideas which grew out of that movement had not then reached Britain and would not arrive until the early 1930s.[23] Here though a brief comparison between Wrinch and Rudolf

[20] See Senechal (2024: 245).

[21] My thanks to an anonymous referee for raising this challenge.

[22] A standard history of logical empiricism would place the development of their ideas roughly concurrently with the publication of Wrinch's works on the relation of science to philosophy. The issue though is complex; Stadler identifies a '*proto-circle*' (Stadler 2007: 16) active as early as 1907–1911.

[23] See Beaney (2016: 239–240) for the role played by Susan Stebbing in this regard.

Carnap is relevant, for Carnap's ([1928] 1967)[24] position in his *Der Logische Aufbau der Welt* (*Aufbau*)[25] is superficially similar to that of Wrinch, insofar as he develops a reductive analysis of scientific language by means of Russellian logic in which the empirical basis of scientific knowledge in individual experience is emphasised. In his *Aufbau* however Carnap conceives of the *content* of experience by which we gain knowledge of the world as essentially private to the individuals whose experience it is; and this content, being private, is strictly incommunicable to others. The chief obstacle facing Carnap's reductive empiricist programme is in his view therefore that of solipsism. Insofar as Carnap's and Wrinch's views are similar in respect of their both being reductive and empiricist in character, it is worth asking whether Wrinch's view does not face a related solipsistic obstacle, and if so, how it is dealt with. Carnap ([1928] 1967: 21–22) aims to show that all scientific statements may be translated into claims concerning the *structure* of relations holding between private 'autopsychological' episodes, where a purely structural description is conceived of by Carnap also as formal, such that descriptions of this kind make no reference to the nature of those entities standing in the relevant relations. The postulation of structure here is invoked to guarantee an objective basis for inter-subjective communication, and that guarantee is viewed by Carnap as required, for autopsychological episodes are private and to that extent incommunicable.[26] It is the structure of our private experiences which is communicated in the statement of scientific theories on this position, though there could not be anything *structured* without the presence of experience so conceived. In this way then Carnap finds a place both for private experience and objective reality in the project of his *Aufbau*. Wrinch, as we saw in Section 2, emphasises the discovery of structure in the development of science, and she characterises the postulation of formal principles governing distinct bodies of knowledge as constituting such a discovery. Wrinch does not though hold that *all* scientific claims are capable of being translated into purely formal terms. Rather, a given science may include both formal

[24] Page references are to the 1967 translation.

[25] Written, Carnap says, "in the years 1922–25" (Carnap [1928] 1967: v).

[26] "A system form with an autopsychological basis is acceptable only because it is recognized that *science is essentially concerned with structure and that, therefore, there is a way to construct the objective by starting from the individual stream of experience*" (Carnap [1928] 1967: 107, emphasis original).

principles and principles not capable of being stated in purely formal terms, according to Wrinch; formal principles are more fundamental than others, but do not replace those they govern. Does Wrinch then fall into a commitment to incommunicable and solipsistic scientific claims, such as Carnap had gone to great lengths to avoid? I do not think so. It is quite plausible to suppose that Wrinch had operated with a Russellian conception of *sense-data*, according to which sense-data are *not* mind-dependent:

> Logically a sense-datum is an object, a particular of which the subject is aware. It does not contain the subject as a part, as for example beliefs and volitions do. The existence of the sense-datum is therefore not logically dependent upon that of the subject. (Russell 1918a: 152)

Wrinch's being immersed in Russellian terminology again supports the claim that, unless otherwise stated, her use of that terminology concords with his own. If we assume that Wrinch did employ the term 'sense-data' in the relevant sense, we can see why she would not have felt any pressing danger of solipsism as emerging from her empiricist position.

Carnap is extremely well-known for rejecting metaphysical claims as 'pseudo-problems'. In his own words, however, his later 1927

> condemnation of all these theses about metaphysical reality (which is clearly distinguished from empirical reality) is more radical than that in the *Aufbau*, where such theses were merely excluded from the domain of science. (Carnap [1928] 1967: xi)

Wrinch, as we have seen, rejected idealist claims as literally insignificant in part *because* such claims cannot be settled by an assessment of the ways in which empirical observations are correlated with one another. Moreover, her rejection of metaphysical debates pre-dates that of Carnap by half a decade. We must conclude, then, that Wrinch was an original thinker who combined then-novel techniques in logic with a deep understanding of scientific theory in order to reach a radical, anti-metaphysical empiricism founded upon the analysis of language.

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