

Sense-Data in Russell's Theories of Knowledge

Traditionally, sense-data are the ultimate data in a standard foundationalist account of empirical knowledge: the completely certain, immediate, precise data of experience from which all other empirical truths are inferred. During the first phase of his work in epistemology, Bertrand Russell subscribed to some version of this account. But, as he describes his evolution in *My Philosophical Development* (MPD), by 1921 his views on sense-data had undergone “a very important change” (p. 134); indeed, the “last substantial change” in “my philosophy” (p. 13). Previously he had “thought that sensation is a fundamentally relational occurrence in which a subject is ‘aware’ of an object,” “had used the concept ‘awareness’ or ‘acquaintance’ to express the relation of subject to object,” and had employed the term “sense-datum” to denote the object of sensory acquaintance. But then he “became convinced that William James had been right in denying the relational character of sensations,” and in contending “that the supposed subject is the name of a non-entity [and that] those who still cling to it are clinging to a mere echo, the faint rumor left behind by the disappearing ‘soul’ upon the air of philosophy.” Accordingly, Russell tells us, “In *The Analysis of Mind* (1921) I explicitly abandoned ‘sense-data’ ” (pp. 134–35).

The reader must beware of this dramatic pronouncement. For, as we shall see, Russell goes on to describe an evolution of his views on sensation and perception that can easily seem to be, if not the reintroduction of sense-data under another name, at least the introduction of something very like them. The interpretive problem here is difficult, and far from solved. A few of Russell’s commentators have argued that he completely abandoned sense-data; a few have argued that he retained sense-data in virtually their original form; many take his claim of abandonment at face value, without asking in what respects it is accurate and in which inaccurate; and many commentators completely avoid the issue. Russell’s later philosophy cannot be fully understood without confronting and resolving the issue.

Neither of the extreme interpretations—that Russell completely abandoned sense-data, or that he virtually retained them—seems correct. As a first approxi-

mation to a correct interpretation, we may say that before abandonment sense-data were held to be the *absolutely* certain (indubitable, infallible), immediate (uninferred, self-evident), precise (analyzed, simple) data of empirical knowledge; and after abandonment were held to be only *relatively* certain, immediate, and precise, i.e. certain, immediate, and precise *to some degree*. We will seek an even more exact formulation. We shall find that the difference between the pre- and the postabandonment positions is exceedingly subtle, and less marked than the preceding formulation suggests. For there is evidence that even in the preabandonment phase Russell held that the actual data of sense are not absolutely certain, immediate, or precise; and that the sense-datum is an ideal that the actual data approximate more or less closely. Furthermore, in the postabandonment phase, Russell held that the actual data of sensation and perception admit of degrees, and that they converge toward an ideal limit as they become more and more certain, immediate, and precise. My suggestion will be that the original sense-datum becomes the ideal, practically unachievable limit of the actual data of sensation and perception.

The suggested view is of great importance. It is a sort of compromise between a pure foundationalist theory of knowledge and a pure coherence theory, and incorporates many of the best features of both. It may be some such view that is currently needed in philosophy of perception. For most workers in the field have been dissuaded from a pure foundationalist theory by the coherentist critics, and yet few can accept a pure coherence theory. It will emerge, however, that Russell's compromise is not without its difficulties.

Russell's Preabandonment Doctrine of Sense-Data

Russell defines "sense-data" in *The Problems of Philosophy* (PP) in a famous passage of chapter I (p. 12):

Let us give the name of "sense-data" to the things that are immediately known in sensation: such things as colours, sounds, smells, hardnesses, roughnesses, and so on. We shall give the name "sensation" to the experience of being immediately aware of these things. . . . If we are to know anything about the table, it must be by means of the sense-data—brown colour, oblong shape, smoothness, etc.—which we associate with the table.

In chapter IV Russell introduces the term "acquaintance," and defines it as follows (pp. 46–47):

We shall say that we have *acquaintance* with anything of which we are directly aware, without the intermediary of any process of inference or any knowledge of truths. Thus in the presence of my table I am acquainted with the sense-data that make up the appearance of my table—its colour, shape, hardness, smoothness, etc.

In this and the next few pages we learn that acquaintance is a general term for a relation with the following varieties: *sensation* of present sense-data (pp. 46–47), *memory* of past sense-data (pp. 48–49), *introspection*, or self-consciousness, of one's own mental activities, such as thoughts, feelings, and seeing the sun (pp. 49–50), and *conceiving* of universals, or general ideas, such as whiteness, brotherhood, and diversity (pp. 51–52).

Russell's list of examples of sense-data—"colours, sounds, smells, hardnesses, roughnesses, and so on"—seems to suggest that sense-data are particular instances of simple properties, and are in all cases simple. But a different suggestion emerges later in the book (PP, p. 114), when examples are given of judgments that arise "when the object of sense is complex." The two examples are "That patch of red is round," and "This is to the right of that," where "this" and "that" are seen simultaneously. These are contrasted with a judgment that "simply asserts the *existence* of the sense-datum, without in any way analyzing it": that expressed by "There is such-and-such a patch of red," or "There is that." The passage is puzzling. For unless "That patch of red is round" means "That patch is red and that patch is round," then the difference between it and the example of an apparently simple sense-datum is not clear. And if this is the meaning, then the sentence describes two sense-data and is not atomic. Furthermore, Russell notes that the two kinds of proposition "in the last analysis . . . may coalesce." As we shall see, the distinction between simple and complex sense-data is troublesome. In any case, the passage seems clearly to imply that there are complex sense-data, or objects of sense, which are objects of sensory acquaintance, and that not all sense-data are simple.

PP was a work designed for a general audience, and its standard of precision is occasionally below the high level Russell normally employed for professional audiences. In a brief paper entitled "The Nature of Sense-Data" (NSD), he gives his doctrine of sense-data a precise and terse formulation. First, he defines presentation and judgment (of sensation) (p. 76):

Presentation (or acquaintance) is a two-term relation of a subject, or (better) an act, to a single (simple or complex) object, while judgment is a multiple relation of a subject or act to the several objects concerned in the judgment. From the fact that the presentation is a two-term relation, the question of truth or error cannot arise with regard to it: in any case of presentation there is a certain relation of an act to an object, and the question whether there is such an object cannot arise. In the case of judgment, error can arise; for although the several objects of the judgment cannot be illusory, they may not be related as the judgment believes that they are.

Next he defines "sensible presentations" as those having "objects simultaneous with the act of presentation," and finally defines "sense-data" as "objects of sensible presentations" (p. 77). He stipulates that the term "sensation" is to denote the

“complex act-acquainted-with-object” (p. 77), and that the term “perception” is synonymous with “sensation” (p. 80). Thus “judgment of sensation” and “judgment of perception” (he normally prefers the latter) are synonyms in the paper. These definitions and explanations standardize the use of the ambiguous terms, “sensation” and “perception,” during the preabandonment phase, and we will adopt them.

The preceding passage indicates that a subject can be acquainted with either a “simple” or a “complex object,” from which it follows that sense-data can be either simple or complex. But examples are not provided. For these one must look elsewhere: in PP, and surprisingly, in volume 1 of *Principia Mathematica* (PM1). In PM1 (pp. 43–44) Russell carefully develops the logic of sensation, sense-data, and judgments of sensation, but under other labels: “perception” for “sensation” and “(perceived) object” for “sense-datum.” He defines a complex object as follows (p. 44):

We will give the name of “a *complex*” to any object such as “*a* in the relation *R* to *b*” or “*a* having the quality *q*” or “*a* and *b* and *c* standing in the relation *S*.” Broadly speaking, a *complex* is anything which occurs in the universe and is not simple. We will call a judgment *elementary* when it merely asserts such things as “*a* has the relation *R* to *b*,” “*a* has the quality *q*,” or “*a* and *b* and *c* stand in the relation *S*.” Then an *elementary* judgment is true when there is a corresponding complex, and false when there is no corresponding complex.

The types of complex objects mentioned here involve two-term and three-term—and by implication—*n*-term relations, and also qualities (properties). A specific example of an object involving a property can be found in an adjacent passage (pp. 43–44):

A judgment does not have a single object, namely the proposition, but has several interrelated objects. That is to say, the relation which constitutes judgment is not a relation of two terms, namely the judging mind and the proposition, but is a relation of several terms, namely the mind and what are called the constituents of the proposition. That is, when we judge (say) “this is red,” what occurs is a relation of three terms, the mind, and “this,” and red. On the other hand, when we *perceive* “the redness of this,” there is a relation of two terms, namely the mind and the complex object “the redness of this.”

Specific examples of the relational type are not explicitly provided, but one is vividly suggested in the following passage (p. 43): “The complex object ‘*a*-in-the-relation-*R*-to-*b*’ may be capable of being *perceived*; when perceived, it is perceived as one object. Attention may show that it is complex; we then *judge* that *a* and *b* stand in the relation *R*.” An example of a complex object of this type is the fact described by the sentence “This is to the left of that.”

The position in the preceding passages can be summarized as follows. A *sensa-*

tion (perception) is a two-term relation between a subject, S , and an object, which is called a sense-datum. Simple, or 0-term sense-data, are particulars, of which the most notable examples are instances of qualities, such as a particular instance of redness. Complex sense-data are n -term objects, where n is greater than or equal to 1, and may be called sensible facts. For the simplest complex sense-datum $n = 1$; e.g., this-having-the-quality-redness. For the next simplest, $n = 2$; e.g., this-being-to-the-left-of-that, or perhaps this-red-patch-being-to-the-left-of-that-blue-patch. And so on for any n . The *judgment of sensation* (perception) associated with a perception of a complex sense-datum is a multiple (more-than-two term) relation between a subject and (individually) the n constituents of the corresponding sense-datum. No judgment is associated with the perception of a simple sense-datum. The judgment is true if the corresponding sense-datum exists, false otherwise.

Sense-data are thus seen to be the basis and ground of our judgments of sensation. Simple sense-data are the constituent objects of our judgments, without which the judgments could not even exist. Complex sense-data are the facts that make the judgments true or false, the truth-conditions of the judgments. As Russell says in his pellucid essay, "On the Nature of Truth and Falsehood" (NTF, p. 157):

We see that in the case of the judgment of perception there is, corresponding to the judgment, a certain complex which is perceived, as one complex, in the perception upon which the judgment is based. It is because there is such a complex object that the judgment is true. This complex object, in the cases where it is perceived, is the objective of the perception. Where it is not perceived, it is still the necessary and sufficient condition of the truth of the judgment.

The passages examined in the present section clearly suggest that sense-data are the *grounds* and *tests* for all our rational, conscious empirical knowledge. All such knowledge consists of well-founded, true judgments. The truth and falsity of every nonelementary empirical judgment is defined in terms of the truth and falsity of elementary judgments of sensation. And sense-data are the truth-conditions for every elementary judgment of sensation. Hence, sense-data are the *grounds* for all our empirical judgments. Furthermore, sense-data are the means by which our judgments are confirmed and disconfirmed. An elementary judgment of sensation is directly confirmed or disconfirmed as follows: the confirmer (who is the subject of the judgment, since sense-data are private) senses various sense-data and attends to their components and the relations between them. If attention reveals a sense-datum whose components correspond in type and number to the objects of the judgments, and whose relations are those which in the judgment are taken to obtain, then the judgment is confirmed. If no such sense-datum is perceived or noticed, then the judgment is, to some degree, disconfirmed. Nonelementary empirical judgments are indirectly confirmed or disconfirmed by

determining (by means of inference) their agreement or disagreement with elementary empirical judgments. Hence, sense-data are the tests, or warrants, for all our empirical knowledge.

The Evolution of the Postabandonment Doctrine

Chapter XI of MPD contains Russell's own history of the development of his views on sensation and perception from abandonment until around 1959, when the book was published. Except for a few additional sentences scattered throughout the book, it constitutes his final published words on the subject. He describes his initial postabandonment position by quoting from AMi (MPD p. 136):

When we do this [dispense with the subject as one of the actual ingredients of the world], the possibility of distinguishing the sensation from the sense-datum vanishes; at least I see no way of preserving the distinction. Accordingly the sensation that we have when we see a patch of colour simply *is* that patch of colour, an actual constituent of the physical world, and part of what physics is concerned with. A patch of colour certainly is not knowledge, and therefore we cannot say that pure sensation is cognitive. Through its psychological effects, it is the cause of cognitions, partly by being itself a sign of things that are correlated with it, as e.g., sensations of sight and touch are correlated, and partly by giving rise to images and memories after the sensation is faded.

It is tempting to interpret this passage as identifying the sense-datum with physical stimulation, for example, with the array of light at the retina in the case of vision. However, Russell may be using the word "physical" here to mean "nonmental," i.e., to refer to physical, physiological, or neurological processes. (It was this use that he made of the term in RSDP [section 4] in arguing that although sense-data are dependent on the body of the perceiver, they are not "mental.") The sensation, which is now held to be indistinguishable from the original sense-datum, is said to be the cause of the images and memories that are the psychological or cognitive ("mental") components of the causal process of perception. Now the most immediate such causes are neural excitations, so the best interpretation would seem to be this: sensing (acquaintance, awareness) is replaced by the having of a perceptual image, and the sense-datum is replaced by the neural excitation that causes the image, and is, confusingly, called a sensation.

If we assume that Russell uses "awareness" ("acquaintance") as roughly synonymous with "consciousness," then what he says in AMi (but does not allude to in MPD) about consciousness of sensation becomes clear. For, as with awareness, consciousness of a sensation (sense-datum) should consist in having an image of the sensation (sense-datum). And on pages 288–89 of AMi that is precisely what Russell says:

When a sensation is followed by an image which is a “copy” of it, I think it may be said that the existence of the image constitutes consciousness of the sensation, provided it is accompanied by that sort of belief which, when we reflect upon it, makes us feel that the image is a “sign” of something other than itself. This is the sort of belief which, in the case of memory, we expressed in the words “this occurred.”

The analysis suggested here can be stated as follows: *S* is conscious of *X* if and only if *S* has an image of *X* and a belief that refers the image to *X*. Where *X* is an image, consciousness of the image consists in having a second image and a belief referring it to the first. Here the one image can perhaps be a copy of the other. But where *X* is a sensation, consciousness of *X* consists, on our interpretation, in having an image of some neural excitation.

Since it is not clear in what respect an image can resemble or be a “copy” of neural excitation, Russell is right to put the word in quotation marks. An image can be said to be a copy of *X* in the sense of being referred by a belief to *X*. But it must be borne in mind that the referring belief, whose content is roughly “This occurred,” does not imply that *S* was ever conscious of the “this” in any other sense than that of having an image of it. To be conscious of *X* in the sense of AMi is *not* to be conscious of it in the sense of awareness, the sense in which consciousness and its object are simultaneous. This point emerges in a passage three pages later (AMi, p. 292):

A sensation which is remembered becomes an object of consciousness as soon as it begins to be remembered, which will normally be almost immediately after its occurrence (if at all); but while it exists it is not an object of consciousness.

Thus, from the perspective of the preabandonment position, in which *S* could be simultaneously aware of a sense-datum, the sensation is systematically elusive: *S*’s attempt to grasp it while it occurs in an act of “consciousness” (awareness) necessarily fails. *S* can at best have an image of the sensation, and then only after it has occurred; and, to make matters worse, *S* can be conscious of the *image* of the sensation only in the sense of having another image of it, and so on ad infinitum. The sensation thus seems to remain forever out of *S*’s cognitive grasp. In a moment I will suggest that it was this feature of his initial postabandonment view that made it ultimately unacceptable to Russell.

Russell’s suggestion that he “dispense[s] with the subject” in AMi is a dramatic overstatement. His abandonment of sense-data accompanies his adoption of a position like that introduced by Hume and championed by James under the label *neutral monism*. On this doctrine both (mental) subjects and (physical) objects are analyzed into “neutral” elements that in themselves are neither mental or physical, and the difference between mental and physical objects is held to consist, not in

their fundamental constituents, but in the way these are arranged. In Hume's version, the "neutral" elements are held to be ideas (images) and impressions (vivid ideas). Minds (selves, subjects) and bodies thus become "logical constructions formed out of materials not differing vitally and sometimes actually identical" (MPD, p. 139). Russell thus "dispenses with the subject" only in the sense that he replaces the simple subject by a complex subject composed of metaphysically neutral constituents.

In Russell's first version of his neutral monism (found in AMi), sensed and unsensed sensibilia are held to be the fundamental constituents of all things. In a later version (found in AMa) nonsensible events are added to sensibilia as fundamental constituents. In either version, acquaintance with sensibilia does not fit well into a neutral monist metaphysics, for acquaintance is assumed to be the act of a simple, unanalyzable ("pin point") subject. But an image caused by neural excitation fits in easily. The object called Russell is a collection of images, memories, and other events, whose subsets are arranged in causal chains. One such chain is Russell's memory of his pipe: the first event in this chain is a past impression of the pipe, and the last event is a present image resembling this impression. Another such chain is his visual perception of his pipe: the first event in this chain is light falling on the surface of the pipe, the next-to-last event is the neural excitation indirectly caused by the reflected light, and the last event is his present impression of a pipe.

The pipe itself is a collection of physical events, whose subsets are also arranged in causal chains. One of these chains ends with the optic array in the causal chain ending with Russell's visual impression of his pipe. The neural excitation produced by this optic array is clearly a part of Russell (though not necessarily a part of his conscious mind), and there may be reason for considering it part of the pipe as well. For when objects are analyzed into events, it is difficult to draw the boundaries between the perceiver and the perceived object. As Russell puts it in MPD (p. 139), "A sensation may be grouped with a number of other occurrences by a memory-chain, in which case it becomes part of a mind; or it may be grouped with its causal antecedents, in which case it appears as part of the physical world." (This use of "physical" is further evidence that the scope of the term is intended to include the neurophysiological, and that sensations are taken in MPD to be neurophysiological events—neural excitations, we have called them.)

To summarize, in AMi Russell replaced acquaintance with the having of an image and a feeling of belief, replaced the sense-datum with a neural event called a sensation, and, in neutral-monist fashion, replaced the simple subject with a complex subject composed of images, feelings, and other events arranged in the order that constitutes a mind. He retained the neutral-monist metaphysics throughout AMa, although he there added to it nonsensible events. But the theory ultimately failed to satisfy him, as he explains in MPD. For "new prob-

lems . . . arose as a consequence of the abandonment of sense-data,” which required that “such words as ‘awareness,’ ‘acquaintance,’ and ‘experience’ . . . be re-defined” (MPD, p. 136). The problems in question, Russell indicates, are concerned with how experience, or perception, provides knowledge of the external world (MPD, pp. 136–38), how empirical evidence—the evidence of the senses—is to be understood (MPD, pp. 136, 140). The difficulty, presumably, is that such knowledge seems ruled out by the new view that sensation is not cognitive, not knowledge. We saw that according to AMi the subject is not aware (simultaneously conscious) of the neural events that correspond to the original sense-datum. But if *S* is not aware of these neural events, then it would seem that he cannot have knowledge of them. And if he does not have knowledge of them, then it is difficult to understand how he can have knowledge of the external physical world, since the neural events in question comprise the causal interface between *S* and the external physical world. Whatever the precise nature of the difficulty, Russell says (MPD, p. 139) it forced him to the following conclusion:

There is a duality . . . in any form of knowledge. . . . We are aware of something, we have a recollection of something, and, generally, knowing is distinct from that which is known. This duality, after it has been banished from sensation, has to be somehow re-introduced.

Accordingly, he tells us, “In the *Inquiry into Meaning and Truth* . . . I replaced ‘acquaintance’ by ‘noticing,’ which I accepted as an undefined term” (MPD, p. 140). He quotes three full pages of IMT (pp. 49–51) to describe the concept of noticing. We are warned that noticing is “very hard to define” and that “any very exact definition is likely to mislead,” and are offered the following characterization (MPD, p. 142):

“Noticing” is a matter of degree . . . [and] seems to consist mainly in isolating from the sensible environment. You may, for instance, in listening to a piece of music, deliberately notice only the part of the cello. You hear the rest, as is said, “unconsciously.” . . . It seems then that the most immediate knowing of which we have experience [i.e., noticing] involves sensible presence plus something more. . . . which may be called “attention”; this is partly a sharpening of the appropriate sense-organs, partly an emotional reaction. A sudden loud noise is almost sure to command attention, but so does a very faint sound that has emotional significance.

And then the following empiricist principle is laid down:

Every empirical proposition is based upon one or more sensible occurrences that were noticed when they occurred, or immediately after, while they still formed part of the specious present. Such occurrences, we shall say, are “known” when they are noticed.

Thus knowing, or cognition—with its “duality” between the knowing and what is known—is reintroduced, and the basis of empirical knowledge is redescribed, as noticing.

Russell concludes his sketch of the view in *IMT* by summarizing various of its passages as follows (*MPD*, p. 143):

“Perception” as opposed to “sensation” involves habit based upon past experience. We may distinguish sensation as that part of our total experience which is due to the stimulus alone, independently of past history. This is a theoretical core in the total occurrence. The total occurrence is always an interpretation in which the sensational core has accretions embodying habits. When you see a dog, the sensational core is a patch of colour stripped of all the adjuncts involved in recognizing it as a dog. You expect the patch of colour to move in the way that is characteristic of dogs, you expect that if it makes a noise it will bark or growl, and not crow like a cock. You are convinced that it could be touched and that it will not vanish into thin air, but has a future and a past. I do not mean that all this is “conscious,” but its presence is shown by the astonishment that you would feel if things worked out otherwise. It is these accretions that turn a sensation into a perception.

Russell uses the sentence “There is a canoid patch of color” as a shorthand description of the pattern of colors constituting the sensational core of perception, intending no inference or implication whatever concerning the character of the object that has the pattern, in particular, no implication that it is anything like a canine (*IMT*, pp. 21, 139). We will use the phrase in the same way, i.e., as a convenient abbreviation for some such sentence as “There is an irregular, approximately oblong brown patch with a white spot at the upper end (the eye) and a long narrow bottom end (the tail) inside a green patch (the lawn on which the dog sits).”

These passages in *MPD* contain Russell’s last published words on the postabandonment evolution of his theory of sensation and perception, but they are tantalizingly incomplete. For one expects, and yet fails, to find in them a definite answer to the question of whether Russell really did or did not abandon sense-data. The simple subject has definitely been abandoned, and replaced by the complex subject, analyzed as a collection of images, expectations, beliefs, and feelings. Sensing (acquaintance, awareness) has been replaced by noticing, and sense-data have apparently been replaced by experiences, or the sensational cores of experiences. Whether these replacements constitute “abandonment” of sensing and sense-data is not at all clear. Not surprisingly, then, answers to the question of whether Russell really abandoned sense-data have ranged over the entire spectrum from definite affirmative to definite negative. I now consider answers in each of these categories.

Some Interpretations of the Abandonment

A useful example of the definite affirmative answer can be found in Wesley Salmon's paper, "Memory and Perception in *Human Knowledge*" (1974). In brief, Salmon argues that Russell abandoned the infallible awareness or sensing of sense-data in favor of the fallible perceptual experience of external objects. I paraphrase passages in which he expounds what he takes to be Russell's postabandonment position:

Sensations are unvarnished experiences, facts, which cannot in themselves be mistaken, and have a kind of incorrigibility. But they do not constitute knowledge, for there is no distinction between the knowing of a sensation and the sensation known. Sensations, though not premises, are causes of the judgments of perception and memory which are the premises of our knowledge. Perceptions, unlike sensations, involve interpretations which go far beyond what is immediately given in sensory experience. For example, when we see a canoid patch of color, we interpret it to be a dog; and this interpretation or inference may be false. Perceptions are therefore fallible. It is such fallible perceptions, not infallible sensations, which provide the premises for scientific inference. . . . Russell accepts neither sensations nor reports of sensations as premises of scientific inference. . . . Perceptual premises are comparable to premises provided by memory. Just as the putative object of my memory experience is a person, dog or table, and not some mythical sense-datum, so the putative object of my perceptual experience is a person, dog, or table. And in both cases the beliefs produced by the experience, and any statements corresponding to these beliefs, are about external objects. (pp. 140–141, 142 n. 1, 145–146)

This interpretation incorporates at least one central feature of Russell's initial preabandonment position in AMi, namely, the dictum that a sensation is not knowledge, not a cognition (premise), but rather a cause of cognition. But it is difficult to see how it can be a correct description of his final position in IMT and HK. For it entails that the canoid patch of color in Russell's example is not a datum for knowledge, and that the statement "There is a canoid patch of color" is not a premise; instead, the perception of a dog is the datum, and "There is a dog which has such and such visual properties" is the premise. And there are at least two objections to such an interpretation.

First, the only good reasons to hold that "There is a canoid patch of color" is not a premise are that (1) it is inferred, or (2) it does not describe a present experience; obviously neither of these conditions is built into the example. Russell imagines himself to be the perceiver and assumes that the perceiver notices a part or aspect of his perceptual experiences correctly described by "There is a canoid patch of color." How otherwise would he know how to describe the sensational

core? Consequently, the example provides us with one of those “sensible occurrences that were noticed” on which “empirical propositions [are] based.” (Russell sometimes seems to maintain that the sensational core of a perception is a theoretical, in-practice-unnoticeable feature of the perception [see below]. Though it may follow from this doctrine that descriptions of sensational cores are not premises of empirical knowledge, it does not follow that “There is a dog” is such a premise.)

Second, in *IMT* Russell virtually says that the sensational core of the perception is a datum (p. 139):

The judgments that common sense bases upon perception, such as “there is a dog,” usually go beyond the present datum, and may therefore be refuted by subsequent evidence. . . . That is why, in the search for data, we are driven to analysis: we are seeking a core which is logically independent of other occurrences. When you think you see a dog, what is really given in perception may be expressed in the words “there is a canoid patch of colour.” No previous or subsequent occurrence, and no experience of others can prove the falsehood of this proposition.

The search for data is a search for a sensational core that is logically independent of other occurrences. Since no experience other than the patch of color can disprove the proposition “There is a canoid patch of color” the patch is in this case the datum sought; and the proposition describing it is a premise for empirical knowledge—contrary to Salmon.

There is also a passage in *HK* (p. 167) where Russell describes inferences to airplanes, birds, walls, houses, and roads from what he calls “the sensational datum,” followed by a passage in which he says (pp. 170–71):

We must exclude from our list of data not only the things that we consciously infer, but all that is obtained by animal [unconscious, spontaneous] inference. . . for knowledge of things outside our own minds. . . it is necessary to regard only sensations as data.

These passages are further evidence that after the alleged abandonment, Russell does not hold that ordinary, unanalyzed perceptions are data. And they raise additional doubts as to whether sense-data were ever abandoned, or at least doubts as to whether they have not been reintroduced. For what is the difference between the “sensational data” of which Russell speaks in *HK*, and the “sense-data” that were allegedly abandoned, besides a difference in name? It is sufficiently difficult to find a significant difference that it is not unreasonable to answer the question whether Russell abandoned sense-data with a definite negative.

A close approximation to this answer is given by no less an authority than A. J. Ayer. In his book, *Russell* (1972), we find the following passage (pp. 73–74):

In the *Analysis of Mind*. . . Russell gives up his belief in the existence of mental acts. This is partly because of his view that the subject, to which they are ascribed, is a logical fiction, and partly. . . because he has been persuaded that no such things are empirically detectable. No longer believing that there are sensations, in the sense in which he had previously used the term, he cannot *a fortiori* believe that they have any objects; and he therefore also denies that there are sense-data. But though he subsequently speaks of himself as having “emphatically abandoned” sense-data at this time [in MPD, p. 245], the change in his view is much less radical than this would suggest. He did cease to employ the term “sense-datum,” but he continued to speak of percepts, to which he attributed the same properties as he had attributed to sense-data, except that of being correlative to sensory acts.

Before we assess this interpretation, a comment on terminology is in order. Russell usually uses “sensational datum,” “sensational core,” “sensible occurrence,” and “sensible fact” where he once would have used “sense-datum.” He frequently uses “percept” in the same way (especially in AMa), but he uses it equally often to denote the unanalyzed, unreduced perceptual experience (see IMT throughout, and HK, part III, book IV). Because of its ambiguity, we will avoid the term “percept.”

Ayer’s interpretation is dubious. He claims that, except for being correlative to a sensory act, all properties once attributed to sense-data are later attributed to sensational data, which suggests that Russell merely excised the offending subject and act of acquaintance, and left the original sense-datum – re-named – with all its other original properties to be used in the original way as a datum, as a certain, immediate, precise datum for empirical knowledge. And there are two objections to the suggestion.

First, it is difficult to understand why, if Ayer’s suggestion is correct, Russell so consistently and adamantly maintained that he “abandoned” sense-data in AMi. Ayer himself calls attention to the fact that in a 1958 review of Ryle’s *Concept of Mind* (reprinted in MPD) Russell says (MPD, p. 245):

A second point upon which I am in agreement with him [Ryle] is the rejection of sense-data. I believed in these at one time, but emphatically abandoned them in 1921 [with a footnote to AMi, p. 141].

It is difficult to reconcile this emphatic statement with Ayer’s suggestion that Russell retained the sense-datum, while merely stripping away the act of acquaintance.

Second, there is substantial evidence from a number of his writings that Russell replaced sense-data with entities having different properties. Earlier, we suggested the following description of the difference as a first approximation: before abandonment, sense-data were held to be *absolutely* certain (infallible, indubit-

able), immediate (uninferred, self-evident), and precise (analyzed, simple); after abandonment, they were held to be *relatively* certain, immediate, and precise.

Let us turn to the texts to see whether they confirm this interpretation.

Are Sense-Data Certain, Infallible, Indubitable?

Several passages in PP state that sense-data are indubitable and completely certain. For example, "It is not possible to doubt the sense-data [associated with the table]" (p. 47); and also (p. 19):

The certainty of our knowledge of our own experiences does not have to be limited in any way to allow for exceptional cases. . . . When I look at my table and see a brown colour, what is quite certain at once is . . . "a brown colour is being seen."

However, it must be borne in mind that the book was written for a popular audience and is occasionally imprecise. These statements seem to be cases in point, for they fail to take account of the distinction between and nature of sensation and judgment, and they are not informed by any analysis of doubt and certainty, which is plainly needed.

Such an analysis is provided in TK (part II, chapter IV). As previously noted, sensation is a two-term relation of acquaintance between a subject and a (simple or complex) object, and judgment is a multiple relation between a subject and the constituents of a complex. In TK Russell adds a new term to the relation—the logical form of the complex—and analyzes understanding, judgment, and belief and disbelief similarly. Since none of the points in this section turns on the inclusion or omission of this constituent, we will omit it for simplicity. Consider the case in which the complex associated with the judgment is *a-to-the-left-of-b*, or simply, *a-L-b*; and let *s* be the subject of the judgment. Then understanding can be symbolically represented as $U(s, a, L, b)$, judgment and belief (which are the same) as $J(s, a, L, b)$ or $B(s, a, L, b)$, and disbelief (which is not taken to be belief in the contradictory) as $D(s, a, L, b)$. (Russell does not use these symbols.) There are many "degrees of belief," or "degrees of uncertainty," ranging all the way from "complete suspense of judgment" to "full belief," or complete certainty; and there are many "degrees of disbelief," or "degrees of uncertainty," ranging all the way from "complete suspense of judgment" to "full disbelief," or "complete uncertainty" (pp. 142–43). Each such degree is a "different relation" (p. 143). By implication, Russell defines doubt, in one sense of the term, as a degree of certainty or uncertainty (considerably?) less than complete certainty or uncertainty; and, in another sense of the term, as an alternation, or vacillation, between belief and disbelief. For simplicity we will consider only doubt in the first sense, since all our points can be restated in terms of the second sense.

On the preceding analysis the following definitions of indubitability and certainty are natural. It is *psychologically indubitable to s* that aLb if and only if it

is psychologically impossible that $D(s, a, L, b)$. It is *epistemologically indubitable to s* that aLb if and only if it is epistemologically inappropriate that $D(s, a, L, b)$. Certainty has a strong and a weak sense. In the strong sense it is *completely certain to s* that aLb if and only if it is indubitable to s that aLb . In the weak sense, it is *completely certain to s* that aLb if and only if $B_{\max}(s, a, L, b)$, where B_{\max} is full belief (complete certainty). We say “psychologically” impossible and “psychologically” necessary, since presumably any belief relation is logically possible. Accordingly, the statement that sense-data are indubitable, or completely certain in the strong sense, should mean that if a subject senses a sense-datum then the corresponding doubt is psychologically impossible, or epistemologically inappropriate. And the statement that sense-data are completely certain in the weak sense should mean that if a subject senses a sense-datum then the corresponding belief is maximal, or that it is epistemologically appropriate for it to be maximal. Are sense-data indubitable and completely certain in these senses? There is no direct answer in TK, or in any of Russell’s other writings, to these questions. Indeed, the questions are never raised in this form. As we shall see, arriving at any answer requires both clarification of the question and considerable interpretation.

We turn now to *infallibility*. Because sensation is a two-term relation between a subject and an object, it is not capable of truth or error, and it is therefore misleading to say that sensation is infallible. For “infallible” may mean “true always” or even “true of necessity”; or it may mean “neither true nor false.” And it is only in the latter, uninteresting sense that sensation is infallible in Russell’s doctrine. It is only judgments, or beliefs (and propositions?), that can properly be said to be true or false, as Russell makes abundantly clear in chapter XII of PP and elsewhere; consequently, only judgments can properly be said to be infallible in any interesting sense. We will attempt to confine the discussion to the interesting senses.

It is clear that most of our judgments are fallible, and that many of them are or have been false. For example, my judgment that the table is to the left of the chair is fallible. The table and chair are known to me merely by description; consequently, I cannot base my judgment on acquaintance with either object. My judgment is obtained by inference from my sense-data, and such inferences are highly fallible. But consider judgments whose nonrelational objects are objects of acquaintance (by “objects” is meant terms other than the subject); for example, my judgment that a is to the left of b , where a and b are patches of color in my visual field. (Assume that the judgment is not linguistically or cognitively mediated, i.e., does not involve the words, “ a ,” “ b ,” “left of,” or any others, nor any ideas, concepts, or representations of the objects of acquaintance.) Is this judgment infallible? Clearly not, for there may exist no corresponding sense-datum to make the judgment true. Consider, then, the same judgment where there does exist a corresponding sense-datum. It follows from the description of the case, together with Russell’s definition of “true judgment,” that the judgment is true.

To express this fact by saying that the judgment is infallible, or that it "must" be true, is to say something misleading and to employ an uninteresting sense of infallible. (As we will see, it appears that on occasion Russell makes this misleading statement.) The interesting question in this case is whether the process by which the judgment was produced is infallible, i.e., *completely reliable*.

We must distinguish between a *direct process* of this type and an *indirect process*. In a direct process, the judgment that aLb (to continue with our example) is produced by the sensation of $a-L-b$ without any intermediate events that causally influence the judgment. Russell does not discuss this case. The explanation may be that he believes judgments of sensation are never directly produced, but are produced through the intermediate process of *analysis*. He discusses analysis in a passage of PM previously cited. He defines a judgment of perception (sensation) as a judgment derived by attention and analysis from a—presumably corresponding—perception (sensation), and then says (PMT, p. 43):

A judgment of perception, according to the above definition, must be true. This does not mean that, in a judgment which *appears* to be one of perception, we are sure of not being in error, since we may err in thinking that our judgment has really been derived merely by analysis of what was perceived. But if our judgment has been so derived, it must be true.

(Only analysis is mentioned in the part of the passage quoted earlier, and only attention is mentioned in the statement of the definition of a judgment of perception. As we will discover, Russell's later treatment of analysis held it to be a complex process involving many acts of attention. Therefore we may refer to the process of deriving judgments from sensation simply as that of analysis.)

Now why does Russell assert that the judgment of sensation "must be true"? It is not because a judgment of sensation is by definition accompanied by a corresponding sensation, and is therefore true by definition, but rather because he believes that analysis is completely reliable. The process of deriving a judgment from a corresponding sensation includes, at a minimum: (a) sensing the corresponding sense-datum, (b) analyzing the sense-datum, and (c) forming the judgment. If (1) no extraneous process intervenes between (b) and (c), so that the judgment is formed on the basis of the analysis, and (2) no extraneous process intervenes between (a) and (b), so that the analysis is of the sense-datum in question, then, if analysis is reliable, the judgment of sensation is true—by definition: by definition of the terms, "on the basis of," "analysis of," and "reliable." Russell's statement that the judgment of sensation "must be true" is misleading, and possibly a little confused. It may in part be an expression of the definition just stated, but it is mainly an expression of his thesis that analysis is reliable. For suppose that conditions (1) and (2) are satisfied, and assume that analysis is reliable; then the judgment of sensation "must be true," in the sense that from these assumptions it follows logically that the judgment of sensation is true.

The reason the subject cannot be “sure” that the judgment is true is that some extraneous process may have intervened between (a) and (b), or between (b) and (c), with the effect that the analysis is not of the sense-datum in question, or is not the basis of the judgment. Either effect makes it to some degree likely that the judgment does not correspond to the sensation that led to it. But, one wants to interject, suppose the subject senses the sense-datum, *a-to-the-left-of-b*, and simultaneously judges that *a* is to the left of *b*: can’t the subject then be sure, indeed absolutely certain, that the judgment is true? One reason for a negative answer is that the subject’s belief that her judgment is true results from an inference based on analysis of the corresponding complexes, and the inference (if not the analysis) may be in error. We will return to this question under our discussion of self-evidence, after an examination of analysis.

Is Analysis of Sense-Data Reliable?

As we saw in the previous section, Russell implies in PM that the analysis involved in the production of judgments of sensation is completely reliable. In PP he appears to give up this doctrine. He distinguishes what he calls “absolute self-evidence” from a second sort, and defines the former as the property possessed by a “truth” when the corresponding fact is perceived. Then he says (p. 137):

Although this sort of self-evidence is an absolute guarantee of truth, it does not enable us to be *absolutely* certain, in the case of any given judgment, that the judgment in question is true. Suppose we first perceive the sun shining, which is a complex fact, and thence proceed to make the judgment “the sun is shining.” In passing from the perception to the judgment, it is necessary to analyse the given complex fact: we have to separate out “the sun” and “shining” as constituents of the fact. In this process it is possible to commit an error; hence even where a *fact* has the first or absolute kind of self-evidence, a judgment believed to correspond to the fact is not absolutely infallible, because it may not really correspond to the fact.

Whether Russell gives up his earlier doctrine in this passage depends on whether he intends “The sun is shining” to be compared with a sense-datum description. It seems that he does so intend it because he treats “the sun” and “shining” as components of the fact, just as he treats the referents of “this” and “white” as components of the sense-datum described by “This is white.” Furthermore, the passage from the perception of the shining sun to the judgment that the sun is shining is comparable to the passage from the perception of a white patch to the judgment that the patch is white. If he thus intends the example, then “analysis” here denotes what it denoted in PM—the decomposition of a complex into its constituents, and he has abandoned his earlier doctrine that analysis is completely reliable.

Strictly speaking, however, the fact described by “The sun is shining” is not a fact that can be sensed; it is not a sense-datum. The term “sun” does not denote

an object of acquaintance but is rather a covert description ("the blinding ball of light"); and the term "shining" does not denote a single universal but rather a complex of universals (casting of light). If the example is intended to be understood in this way, then analysis includes the process of translating the sentence "The sun is shining" into an equivalent sentence whose nonlogical terms denote only objects of acquaintance, by appropriate substitution of definition descriptions, variables, and quantifiers. For example, it might be translated into the sentence "There is one and only one x such that x is a great blinding ball of white light that periodically travels across the sky and x is casting light on the earth"; but this is not yet the final analysis, since it contains the covert descriptions "sky" and "earth." On this interpretation, the term "analysis" does not mean in PP what it means in PM. For in PM the process does not include the preceding process of translation; it is solely the process of decomposing a sense-datum into its components. For example, it is the process of decomposing the sense-datum described by "This is to the left of that," where "this" and "that" denote patches in the visual field, into the one patch, the other patch, and the relation of being-to-the-left-of. If "analysis" denotes different processes in the two works, then of course the unreliability of analysis in the sense of PP does not entail the unreliability of analysis in the sense of PM; and Russell may not have changed his view.

Obviously we need to distinguish two senses of "analysis," or types of analysis: *translational analysis*, which consists in translating a sentence into an equivalent whose nonlogical terms denote objects of acquaintance, and *decompositional analysis*, which consists in isolating the components of a complex fact with which one is acquainted, presumably by attending to the components. (There are still other types or senses of analysis in Russell: the analysis of a science required to discover its axioms; the philosophical analysis, or explication, of a concept; etc.). And then we need to examine Russell's views concerning the reliability of these two kinds of analysis one at a time.

Russell never explicitly discusses the reliability of translational analysis, unless it is in the immediately preceding passage from PP. It seems obvious, however, that translational analysis is not completely reliable, given Russell's standards for reliability. For it is entirely possible that a person performing such an analysis will make any of a number of mistakes—employ an inappropriate description, insert an ordinary name rather than a logically proper name, make a mistake in logic (say, use the wrong quantifier or connective)—and consequently propose a translation that is not equivalent to the original. And it is not possible for the analyzer to be completely certain of not having made one of the possible mistakes.

Russell provides an extended treatment of decompositional analysis in TK (part II, chapter II), a treatment, however, that is confusing and apparently incomplete. He defines analysis as "the discovery of the constituents and the manner of combination of a given complex" (p. 119). His chief example is the analysis

of a perceived capital letter T. The complex here consists of a horizontal stroke on top of a vertical stroke. He points out that “mere selective attention, which makes us aware of what is in fact part of a previously given complex, without making us aware of its being a part, is not analysis” (p. 123). He suggests that “the problem of analysis is the problem of transferring attention from the whole of a complex to the parts,” and fleshes out this suggestion by distinguishing simple perception from complex perception of a complex. The former is defined as “attention to the whole combined with acquaintance with its parts,” and the latter as “acquaintance with a whole combined with attention to its parts” (p. 125, italics omitted). (He clearly implies at the beginning of the book (pp. 8–9) that attention is a species of acquaintance, and at one point says: “attention is a kind of intensified acquaintance”; p. 162.) He then proposes that analysis of a complex consists in (a) simple perception of the complex, (b) complex perception of the complex at a later time, and (c) knowledge that the object of the one perception is identical with the object of the other (pp. 125–26). This knowledge is said to require attention to the object of the complex perception and, *simultaneously*, attention to the object of the (now past) simple perception (pp. 126, 127); and such attention is held to be possible (p. 126).

But Russell assesses his proposal as unsatisfactory: “Thus far nothing effective has been done in the way of analyzing analysis” (p. 127); and there he abruptly leaves the matter. Why he was dissatisfied is not at all clear, but the text provides good support for the following explanation. He believed that (1) a subject can simultaneously attend to a complex, *C*, and to its parts, *c*₁, *c*₂, etc., without perceiving *c*₁-part-of-*C*; and that (2) analysis of the complex requires perceiving *c*₁-part-of-*C*; and observed that (3) analysis of these complexes involving the part-whole relation is the original problem reappearing, still unsolved, in what is the beginning of a regress. If this is his objection, then a reply is possible. We can accept (1) and (2), incorporate them into the analysis of analysis, and deny (3). Although analysis of a perceived complex *C*, requires *perceptions* of the constituents as parts of the complex (of *c*₁-part-of-*C*), it does not require *analysis* of the objects (*c*₁-part-of-*C*) of these perceptions; hence there is no regress. (One difficulty that Russell does not mention, and we will not pursue, is whether it is psychologically possible for a subject to attend simultaneously to a complex and to each—or even one—of its parts.) Thus analysis consists of a sequence of perceptions each consisting of a sensation of *c*₁-part-of-*C*, attentive acquaintance with *c*₁, and attentive acquaintance with *C*. If the sequence contains a perception for each *c*₁, then the analysis is complete.

Analysis, thus analyzed, would seem to be completely reliable on Russell’s view. For it is not possible for a subject to attend to a complex, *C*, or to a part, *c*₁, unless *C* and *c*₁ exist; nor is it possible for a subject to perceive *c*₁-part-of-*C* unless *c*₁ is a part of *C*. This conclusion will not seem correct unless it is understood that analysis involves only perceptions containing sensations of part-whole

facts and acts of attentive acquaintance, and does not require any *judgments* corresponding to these. If, for example, a judgment corresponding to the subject's sensation of c_i -part-of- C were required, and the production of this judgment required analysis, an infinite regress of analysis would ensue. But no such judgment is required. Analysis then is completely reliable. However, if Russell's point in PM1 (p. 43; quoted earlier) is correct, then it does not follow that the subject can be (absolutely) certain, with regard to a given judgment produced by analysis, that it is true. For the subject cannot be (absolutely) certain that the judgment was produced by a process of analysis appropriate to that judgment. For example, the sequence of perceptions leading to the judgment that a is to the left of b might contain a sensation of some irrelevant part-whole fact: a -part-of- C' , or b -part-of- C'' , where C' is the complex a -left-of- c and C'' is the complex a -on-top-of- b .

Are Sense-Data Self-evident?

Russell introduces the term "self-evident" in chapter XI of PP to qualify "truths" (propositions, apparently) that either have not been inferred or cannot be inferred from others. In chapter XIII he sets out to distinguish two sorts of self-evident truths, one of which "ensures infallibility" (p. 135). Then, in a confusing passage (pp. 136–38) he distinguishes between "self-evidence of truths" and the "sort of self-evidence . . . which belongs to judgments in the first instance, and is not derived from direct perception of a fact as a single complex whole." The first sort of self-evidence is said to be "absolute." A serviceable interpretation of these definitions takes "truths" to mean either "propositions" or "judgments" (though in one place it seems to mean "facts"); and takes "direct perception" to mean "perception (sensation) unaccompanied by analysis of the sensed fact." Thus *absolute* self-evidence is a property of propositions, and *relative* self-evidence (as it seems appropriately called) is a property of judgments of perception (sensation) that have been obtained by analysis of a sensed fact. Absolute self-evidence is defined as follows (p. 137):

In all cases where we know by acquaintance a complex fact consisting of certain terms in a certain relation, we say that the truth that these terms are so related has the first or absolute kind of self-evidence, and in these cases the judgment that the terms are so related *must* be true. Thus this sort of self-evidence is an absolute guarantee of truth.

Russell's remarks on the previous page make it clear that the truth in question is self-evident to the subject whose sensory acquaintance is directed upon the fact, or sense-datum. So the definition is this: a truth (proposition, judgment), P , is self-evident to a subject, S , if the fact that corresponds to P is sensed by S . The assertion that the judgment "must be true" is, on this reading, a misleading way of stating this definition. The assertion that self-evidence is an "absolute guarantee of truth" surely means that self-evidence provides absolute assurance, or cer-

tainty, of truth. More precisely, it should mean that if the fact which corresponds to P is sensed by S , then S can be absolutely certain that P .

In the passage immediately following the one just quoted Russell says: "But although this sort of self-evidence is an absolute guarantee of truth, it does not enable us to be *absolutely* certain, in the case of any given judgment, that the judgment in question is true," and he goes on to explain that in the analysis leading to the judgment "it is possible to commit an error." This passage seems blatantly to contradict its predecessor, and it is difficult to explain away the appearance. One possible explanation (among others) is that by "any given judgment" Russell refers to the case in which the judgment was obtained by analysis and the subject is no longer sensing the corresponding fact and does not remember whether one was sensed nor what it was. But why focus on cases where error is possible? Surely a subject can sense and analyze a fact and simultaneously judge that it obtains. In these cases isn't the judgment infallible and the subject absolutely certain that it is true?

This imprecise question can be precisely stated with the help of the analytic apparatus of doubt and certainty previously developed. The subject's judgment (belief) that aLb is the complex $J-s-a-L-b$, and the sensed complex is $a-L-b$. Let T denote the relation of correspondence, or truth. The statement that the subject doubts that her judgment corresponds to the sense-datum can then be expressed symbolically as (*) $D(s, J-s-a-L-b, T, a-L-b)$. And the statement that the subject is completely confident that her judgment corresponds to the sense-datum can be expressed as (**) $B_{\max}(s, J-s-a-L-b, T, a-L-b)$. To say that the subject can be certain in the weak sense that her judgment corresponds to the sense-datum can be taken to mean either that (1) (**) is psychologically possible, or that (2) (**) is epistemologically correct. Both (1) and (2) seem clearly true, since (**) agrees with the assumed data of s 's acquaintance. To say that the subject can be certain in the strong sense that her judgment corresponds to the sense-datum can be taken to mean either that (3) (*) is psychologically impossible, or that (4) (*) is epistemologically incorrect. It may seem equally clear that (*) disagrees with the assumed data of s 's acquaintance, and that therefore both (3) and (4) are true. However, although we assumed that s is acquainted with $J-s-a-L-b$ and with $a-L-b$, we did not thereby assume that s is acquainted with the correspondence relation, T , or with the fact $(J-s-a-L-b)-T-(a-L-b)$, which would make (**) a true belief and (*) a false disbelief (doubt). And, indeed, there is a serious question as to whether this latter assumption could ever be true. For it may be that the relation of correspondence is not the sort of relation with which one can be acquainted; perhaps it is known only by description, and the belief in (**) is obtained by inference. If the latter assumption is never true, then judgments of sensation are not certain (infallible) in the strong, and interesting, sense.

Let us take stock. In the preabandonment period, a sense-datum is the (simple or complex) object in a two-term relation of sensation (acquaintance) with a sub-

ject. Thus defined, neither a *sense-datum* nor a *sensation* is meaningfully said to be certain, immediate, precise, or any of the opposites. A *judgment* based on a sensation is in some sense inferred from the sensation and mediated by its analysis; and no judgment of sensation is infallible, because even if analysis is infallible (which may be doubted) other errors of inference are possible. Consequently, the interpretation that preabandonment sense-data are certain, immediate, and precise and postabandonment sense-data only relatively so is unacceptable. It is tempting to advance the alternative interpretation that Russell abandoned sense-data and the sensations in which they are terms, and was left only with judgments of sensations (or their counterparts), which in both the pre- and postabandonment periods were neither absolutely certain, immediate, nor precise. But postabandonment texts do not support this interpretation either, as we shall see in what follows.

Russell's Final Theory of Empirical Knowledge

Russell's final theory of knowledge is contained in IMT and HK. The linguistic mode of speech is more evident in these than in earlier works, and the distinction between data and inference is often drawn as a distinction between propositions or statements. For example, in IMT data are defined as "propositions for which the evidence is not wholly derived from their logical relation to other propositions" (p. 125). But data are also defined nonlinguistically: in HK as "beliefs for which no further reason can be given" (p. 166), and in MPD as "all the things of which we are aware without inference" (p. 23). Furthermore, Russell makes it clear that beliefs of the datum variety do not require language, for example, the belief involved in "direct sensible knowledge" of a "sensible" fact, such as that expressed by "A loud bang is (or has been, or will be) taking place"; and the beliefs involved in immediate memory or immediate expectation of this sensible fact (HK, pp. 98–99). Remote memory is said to require "an auditory image accompanied by a feeling which could be (but need not be) expressed in the words 'that occurred' "; but he doubts that expectation of the distant future is possible without words (HK, p. 99). He remarks that "belief about something outside my own experience seems usually only possible through the help of language" (HK, p. 99). So he might claim that many inferences must be in the form of propositions or statements. But clearly data need not be.

The chief source for Russell's views on data in HK is part V, chapter VI, entitled "Degrees of Credibility," especially sections C and D. He distinguishes between the view that "premises," or "data," of knowledge "are certain in their own right," and the ("coherence") view that "since no knowledge is certain, there are no data, but our rational beliefs form a closed system in which each part lends support to every other part" (p. 391). His view, which is said to be a "compromise" between the other two, is "that a datum may be uncertain" (p. 391), "may be uncertain in a greater or lesser degree" (p. 395). Degrees of certainty, in one

sense of the term, are identified with as degrees of credibility. Whether any datum or any belief or proposition is completely certain, completely credible, is left undecided (p. 381):

Whether any degree of doubtfulness attaches to the least dubitable of our beliefs is a question with which we need not at present concern ourselves; it is enough that any proposition concerning which we have rational grounds for some degree of belief or disbelief can, in theory, be placed in a scale between certain truth and certain falsehood. Whether these limits are themselves to be included we may leave an open question.

We will return to this open question momentarily.

Russell holds that there is an important connection between mathematical probability and degree of credibility. "The connection is this: When, in relation to all the available evidence, a proposition has a certain mathematical probability, then this measures its degree of credibility" (p. 381). He believes, however, that the two notions are not equivalent, since degree of credibility has wider application than mathematical probability. For the class of cases in which mathematical probability given all the available evidence measures degree of credibility, the question of whether there are completely credible (certain) or completely incredible (doubtful) propositions is the question whether the probability of the propositions can take the value 1 or 0. The question thus becomes partly technical. Every reasonable probability function assigns 0 to contradictory statements and 1 to logically true statements. Whether these values can be assigned to other types of statements—and in particular to evidence statements—is controversial. So the technical considerations do not settle Russell's open question.

In accordance with his proposal that data may be uncertain, or not completely credible, Russell defines a datum as "a proposition which has some degree of rational credibility on its own account, independently of any argument derived from other propositions" (p. 392). Data are shown to have degrees by citing three cases: faint perception (examples: a departing airplane, a star dimming in the gathering light of dawn), uncertain memory, and dim awareness of logical connection. Rational credibility on its own account, or in its own right, as Russell often says, is what he calls "independent credibility" in *IMT* (p. 125) and "self-evidence" earlier in *HK* (pp. 156–57). It is what in *PP* (p. 138) he called "the second sort of self-evidence," and in *TK* (part II, chapter 7) "degrees of certainty."

The pervasiveness of the concept of self-evidence in his philosophy suggests that it is indispensable. And, indeed, Russell says after a critique of Descartes's criterion of clearness and distinctness: "This does not dispose of the concept of 'self-evidence'. . . I do not think we can entirely dispense with self-evidence" (p. 156). Self-evidence was held to be indispensable in the early epistemology of *PP* and *TK* because of the following consideration. Every proposition that is known to be true is one for which there is evidence itself known to be true, that is, one

for which there is evidence for which there is evidence, and so on. Consequently, if a proposition, *P*, is known to be true, then one of the following must be true. (i) *P* is the last element of an infinite linear sequence of propositions, each nonterminal element of which is evidence for its immediate successor. (ii) *P* is the last element of a finite or infinite circular sequence of propositions with a circular initial segment, each nonterminal element of which is evidence for its immediate successor. (*P* may or may not be an element of the circular segment.) (iii) *P* is the last element of a finite sequence of propositions, the first element of which is self-evident. If (i) or (ii) is true, then the proposition is not known; hence (iii) is true. Therefore, if any proposition is known to be true, there are self-evident propositions.

In HK Russell offers an argument reminiscent of the preceding one above. Having defined a datum as a proposition with some degree of independent credibility, he reasons as follows (p. 392):

It is obvious that the conclusion of an argument cannot derive from the argument a higher degree of credibility than that belonging to the premises: consequently, if there is such a thing as rational belief, there must be rational beliefs not wholly based on argument.

He notes that "it does not follow that there are propositions which owe *none* of their credibility to argument." The conclusion is rather that if there are rational beliefs then there are credible beliefs that do not owe all their credibility to inference. How does the conclusion follow? Assume that there are rational beliefs; and assume (the premise) that no conclusion can obtain from its premise a higher credibility; it is supposed to follow that there are independently credible beliefs. But how? Case (ii)—a circle of evidence—is possible given these assumptions if the members of the circular sequence all have the same credibility. Case (i)—an infinite sequence of evidence—is possible given these assumptions if every element of the sequence has no higher credibility than any predecessor. To rule out these subcases Russell must employ some additional, as yet unstated, premise.

The needed premise can be gleaned from his major objection to coherence theories, made as early as PP (p. 122). The objection is that there are indefinitely many coherent systems of belief, between which we cannot decide on the basis of their coherence alone. In other words there are indefinitely many sequences of premises and conclusions, between which we cannot decide except on the basis of independent credibility of their elements (first premises, or if there are none, important conclusions). A system of beliefs supported only by other beliefs in the system is not rational: it hangs in air, without support.

It is just such a metaphor that Russell uses to describe the manner in which a rational system of belief can be supported, or confirmed, by uncertain data having some independent credibility (HK, pp. 395–96):

Given a number of propositions, each having a fairly high degree of intrinsic credibility, and given a system of inferences by virtue of which these various propositions increase each other's credibility, it may be possible in the end to arrive at a body of interconnected propositions having, as a whole, a very high degree of credibility. Within this body, some are only inferred, but none are only premises, for those which are premises are also conclusions. The edifice of knowledge may be compared to a bridge resting on many piers, each of which not only supports the roadway but helps the other piers to stand firm owing to interconnecting girders. The piers are the analogues of the propositions having some intrinsic credibility, while the upper portions of the bridge are the analogues of what is only inferred. But although each pier may be strengthened by the other piers, it is the solid ground that supports the whole, and in like manner it is intrinsic credibility that supports the whole edifice of knowledge.

There must be piers (data) with some degree of independent grounding (some degree of independent credibility) if the bridge is to serve as a reliable basis for vehicular traffic (the system of propositions is to serve as a reliable basis for belief and action); otherwise the entire structure would collapse.

Must any of the piers be completely grounded? Must any of the data be completely credible, completely certain? The clear implication is that none need be for a usable bridge or system of knowledge to be erected. Are any of our data nonetheless completely certain? One can find evidence for the entire range of answers. First, the *positive* answer. "A clap of thunder is indubitable, but a very faint noise is not; that you are seeing the sun on a bright day is self-evident, but a vague blur in a fog may be imaginary" (HK, pp. 156–57). "My visual sensations, when I look in a mirror or see double, are exactly what I think they are" (HK, p. 167). "The physical world of my everyday experience . . . is indubitable, in a way in which the physical world of physics is not. The experience of seeing a chair is one that I cannot explain away. I certainly have this experience, even if I am dreaming" (PFM, p. 152). Now, the *negative* answer. "I do not claim *complete* certainty for anything" (MMD, p. 693). "I am prepared to concede that all data have *some* uncertainty. . . I shall not assume that the actual data which we can obtain are ever completely certain" (IMT, p. 125). "I am not contending that data are ever completely certain, nor is this contention necessary for their importance in theory of knowledge" (HK, p. 166). And finally the *nonanswer*. The evidence for it is that in part V, chapter VI of HK, examined in detail earlier, Russell leaves the question "open" and does not thereafter in the book close it.

These passages show that the question of Russell's final view on certainty, indubitability, and self-evidence of data cannot be decided directly, i.e., on the basis of passages dealing explicitly with the question. For his explicit statements on the topic form an inconsistent set. The question must be attacked indirectly, by

marshaling other sorts of evidence. The examination of this indirect evidence will bring us to the more general question of what the admissible data are in Russell's final theory of knowledge.

Admissible Data for Knowledge

One argument that all data are held to be uncertain to some degree is that otherwise there would be no need for Russell to construct an epistemology in which knowledge based on uncertain data is possible. This argument is inconclusive. Russell might very well believe that one's own momentary sensational data are completely certain and yet hold that these do not by themselves provide a sufficient basis for a useful body of human knowledge. That they are not sufficient is the burden of Russell's critique of what he called the solipsist theory of knowledge: the theory that sense-data (or sensational data) together with suitable principles of demonstrative and/or nondemonstrative inference are a sufficient basis for knowledge. Russell subscribed to this theory in principle, though not in practice, in RSDP and KEW, and he later rejected it. The principles of inference are presumably those mentioned in PP: the laws of logic, and the probabilistic principle of induction.

In RSDP (section VI) Russell states that it is possible to construct material objects out of the sense-data of a single person, the observer, and he implies that the sense-data of the observer would, on such a construction, be an adequate data base for all correct inferences to the existence and character of material objects thus constructed. The implied reason is that on such a construction problematic inferences to unobservable objects become unnecessary. (This reason is insufficient, for an object constructed out of observable entities—say an infinity of these—may nonetheless be unobservable. It would appear that Russell later recognized the inadequacy. He says in HK [pp. 177–78]: “The principles required to justify inferences from mental states of which I am aware to others of which I am not aware are exactly the same as those required for inferences to physical objects and to other minds.”) He concedes that such a construction is an “ideal, to be approached as nearly as possible, but to be reached, if at all, only after a long preliminary labour of which as yet we can only see the very beginning” (RSDP, p. 157). In the meantime he allows himself two types of inferred entity as part of the basis: (a) the sense-data of other people, for which there is evidence of testimony, and (b) unsensed sensibilia.

In AMa Russell gives up the attempt to construct material objects out of sensibilia alone: unobservable events are seen to be also required. In consequence, tables and chairs, and electrons and lightwaves cannot be regarded as entirely observable; and commonsense and scientific inferences to these again appear problematic. In HK (part III, chapter I) Russell concludes that if such inferences are to be justified, there must be principles of non-demonstrative inference among the “premises” of our knowledge, apart from the probabilistic principle of induc-

tion. The purpose of the last part of the book is to identify these principles. At the same time he officially concludes (HK part III, chapters II and III) that the solipsistic attempt to restrict the data for these inferences to “what I am now noticing” (p. 181) cannot succeed. His argument for this conclusion can be reconstructed as follows.

It does not seem that any reasonable set of rules of nondemonstrative inference will make it possible for me to infer the existence and character of tables, electrons, and other minds from the fragmentary, transitory, constantly varying data of what I momentarily notice. For I do not at the moment notice the book I saw moments earlier: I notice only my memory image of it, or words in my present consciousness that suggest it. Nor do I notice the book even when I attentively look at it: at best what I notice is a certain spatial pattern of colors.

And so he concludes that “remembered facts must be included with perceived facts as part of our data, though we may as a rule assign a lower degree of credence to them than we do to facts of present perception” (HK, p. 189). Facts provided by testimony are not included among the data, but are regarded as the result of an inference justified by the principle of analogy (HK, pp. 190–95). All data are said to be “private” to the subject (HK, pp. 217, 225).

What, on the preceding suggestion, is the precise criterion for admissible data? Data are said to consist of “perceived facts” and “remembered facts.” But exactly what class of facts is this? Given Russell’s substitution of noticing for acquaintance, it might seem plausible to propose that datum facts are perceived or remembered facts that have been noticed. And indeed Russell at one point (HK, p. 178) seems to employ this criterion. But in doing so he says, “I notice my dog asleep,” a use of “notice” that is inconsistent with the use made of it earlier in the reconstructed Russellian argument! There it was argued that one does not “momentarily notice” such things as books and dogs, much less dogs asleep, and that in consequence the class of “momentarily noticed” data is too restricted to comprise an adequate basis for knowledge. The problem, of course, is that Russell has used the word “notice” in the ordinary way, in which noticing may contain an inference. Thus used, it does not pick out the data of knowledge as opposed to the inferred items. And Russell has not provided us with any serviceable technical notion. As we found in MPD, he describes noticing as “attention,” and as “partly a sharpening of the appropriate sense-organs, and partly an emotional reaction” (MPD, p. 142). This characterization does not enable us to decide whether Russell noticed his dog asleep in the technical sense.

In light of the familiar contrast between data and inference, the most natural criterion is that data are perceptions and memories that do not contain and are not products of inference. This criterion would exclude all but the sensational cores of perceptions and memories (strictly speaking, all but beliefs or propositions about sensational cores). And indeed such exclusion seems to be Russell’s

intent at one point in HK. He defines "animal inference" as "the process of spontaneous interpretation of sensations" (HK, p. 167), and says that what we ordinarily call "perception" is the "filling out of the sensational core by means of animal inferences" (HK, p. 169). And then follows a passage that has already been quoted in part (p. 170):

From the above considerations it follows that we cannot admit as data all that an uncritical acceptance of common sense would take as given in perception. Only sensations and memories are truly data for our knowledge of the external world. We must exclude from our list of data not only the things that we consciously infer, but all that is obtained by animal inference, such as the imagined hardness of an object seen but not touched.

If Russell excludes from his data all but the sensational cores of his perceptions and memories, then it would seem that data must be independently credible to the highest degree; for they are credible and yet by definition are not the product of inference. And they must be certain in the highest degree, in the sense in which certainty and credibility are identical. This resulting view seems virtually indistinguishable from the preabandonment theory of knowledge that posited completely certain, completely immediate data, perhaps indistinguishable even from a return to the solipsistic theory of knowledge, whose data basis was at one point judged inadequate for knowledge. And it seems clearly to conflict with Russell's final theory of knowledge in part V of HK, which permits data having less than the highest degree of certainty and independent credibility, data that owe some of their credibility to inferences from other data.

One possible interpretation is that the passage is a lapse, a regression to an earlier view. But a more interesting one is available. The troublesome passage speaks of what are "truly data," implying that what is left after the removal of all conscious and unconscious inferences are "true data." The suggestion is that there are *grades of purity* in data, the purer having less admixture of inference than the less pure; the passage describes the process of purifying data to remove the inferential impurities. Perhaps Russell held, or was moving toward, the view that, although inferentially impure data may be used—indeed, may have to be used—in theory of knowledge, still the purer grades are to be preferred to the impure. This view can be supposed to incorporate the following rationale for using impure data. Although the purer the data, the better the theory of knowledge based on them, it is in practice impossible to obtain enough pure data to form the basis of a useful body of knowledge. Consequently, one must for the present make do with data of varying degrees of impurity and hope that in future purer data will be obtained and more adequate bodies of knowledge based on them.

Did Russell believe that pure data are possible? This question is addressed in the next section.

Pure Data

The groundwork for a notion of pure data is laid in IMT (chapters VIII, X, and XI), and various ingredients in the theory can be found in earlier works. In IMT Russell criticizes the coherence (“Hegelian”) theorists of knowledge who “deny the distinction between data and inferences altogether,” and “maintain that in all our knowledge there is an inferential element, . . . and that the test of truth is coherence rather than conformity with ‘fact’ ” (IMT, p. 123). He objects that the view makes new knowledge—knowledge that could not have been inferred from existing knowledge—impossible. And he imagines the following reply on the part of the coherence theorist (p. 123):

Any statement of the new knowledge obtained from perception is always an interpretation based upon accepted theories, and may need subsequent correction if these theories turn out to be unsuitable. If I say, for example, “Look, there is an eclipse of the moon,” I use my knowledge of astronomy to interpret what I see. No words exist. . . which do not embody theories or hypotheses, and the crude fact of perception is therefore for ever ineffable.

The gist of this reply is that no datum is pure, in our sense of not containing or being the product of an inference. Russell’s counter is as follows:

I think that this view underestimates the powers of analysis. It is undeniable that our every-day interpretations of perceptive experiences, and even all our every-day words, embody theories. But it is not impossible to whittle away the element of interpretation, or to invent an artificial language involving a minimum of theory. By these methods we can approach asymptotically to the pure datum. That there must be a pure datum is, I think, a logically irrefutable consequence of the fact that perception gives rise to new knowledge.

A pure datum would presumably be reported in a proposition that obtains none of its credibility from other propositions. If such a proposition describing one’s perception could be formulated, it would be an almost exact postabandonment replica of the original sense-datum proposition, or judgment of sensation. It would just as certain, self-evident, and independently credible as the original; it would be verified by noticing (attending to) and analyzing one’s experience; it would be grounded, or made true, by the feature of one’s perceptual experience it describes. It would thus lack only one property of the original: it would not describe (or be) the object term in a two-term relation called “acquaintance” between a subject and an object. And even this difference may be eliminable. For Russell sometimes describes acquaintance as a two-term relation between an *act* and an object; and noticing can be similarly described.

Are pure data obtainable (noticeable?), according to Russell? Or, to pose the linguistic version, are pure datum statements formulatable? The answer is that obviously they are, since “There is a red patch to the left of a blue patch” is an exam-

ple and seems incorrect. For Russell says that by the method of analysis we can "approach asymptotically to the pure datum." If he is using the word "asymptotically" in its mathematical sense, which seems likely, then he means that we can by more and more analysis more and more closely approach a pure datum, though we cannot actually obtain (notice?) one. Or, to make the point in its linguistic version, we can by analysis and the development of an improved language approximate a pure datum statement, though we cannot actually formulate one. If this is Russell's meaning, then "There is a red patch to the left of a blue patch" is not a pure datum statement, since it has just been formulated.

What then are the next few items in the sequence of purer and purer datum statements? In what language are they written? Not ordinary English, presumably, since it seems impossible to devise a sentence of ordinary English that more accurately describes my perceptual datum than "There is a red patch to the left of a blue patch." In some places Russell suggests that the more accurate datum reports will be the product of psychological theorizing, and hence written in the technical language of psychology. For example (AMi, p. 140):

In order . . . to arrive at what really is sensation in an occurrence . . . we have to pare away all that is due to habit or expectation or interpretation. This is a matter for the psychologist, and by no means an easy matter.

At one point Russell implies that these elements may not be conscious (not noticeable?). He says (AMa, p. 189): "Part [of the interpretation that usually accompanies a perception] can only be discovered by careful theory, and can never be made introspectively obvious [made conscious by mere attention]". If the interpretive component of a perception cannot be made conscious, then clearly the noninterpretative, sensational component cannot be made conscious either. The suggestion, then, is that psychology can formulate statements describing elements of our perceptual experience that are purer (less inferential) than those that are conscious and describable in ordinary language, and that there is a sequence of such experiences that "approach asymptotically to the pure datum."

Our question thus takes the following form: Are pure data obtainable by psychology? Or (linguistic version) are pure datum statements formulatable by psychology? Again one could argue that Russell's employment of the phrase "approach asymptotically" implies a negative answer, and that he regarded pure data as a useful but unobtainable ideal. But it is also possible that if he had fully developed his suggestion, he would have employed a different phrase and would have held that pure data are obtainable. In light of his remark (previously quoted from MPD, p. 143) that "sensation [is] that part of our total experience which is due to the stimulus alone," it seems reasonable to speculate that he might have adopted the following position. Pure data are comprised of stimulation at the receptors, and are unconsciously sensed by the receptors; and psychology is capable of describing the stimulation as initially sensed, without the layers of interpretation

added to it by the rest of the perceptual-cognitive mechanism. On this view the original sense-datum rises phoenix-like from the ruins of Russell's abandonment, reincarnated at the level of unconscious sensation in the dress of cognitive psychology. Philosopher of science (including psychology) that he was, Russell might quite have liked the result.

Unfortunately there is a difficulty, whether pure data are held to be obtainable or unobtainable. Datum statements formulated in a psychological theory are supposed to be purer (less inferential, less theory-laden) than those available in ordinary language. But the language of psychology (and of every other science) is an extension of ordinary language, and psychological statements – including the allegedly purer datum statements – obtain some of their credibility from statements of the ordinary language they extend. In contrast, datum statements formulated in ordinary language obtain none of their credibility from psychological statements. Consequently, it is difficult to see how technical psychological datum statements can be purer than those formulatable in ordinary language. The psychological datum statements may be more accurate, and may describe features of experience that ordinary language cannot describe; but there is no reason to suppose that they will be inferentially purer. Consequently they do not seem to be members of any sequence of statements that “approach [asymptotically or otherwise] to the pure datum.” Consequently, it would be hard to argue that they constitute a more adequate basis for our knowledge than do our ordinary perceptual propositions.