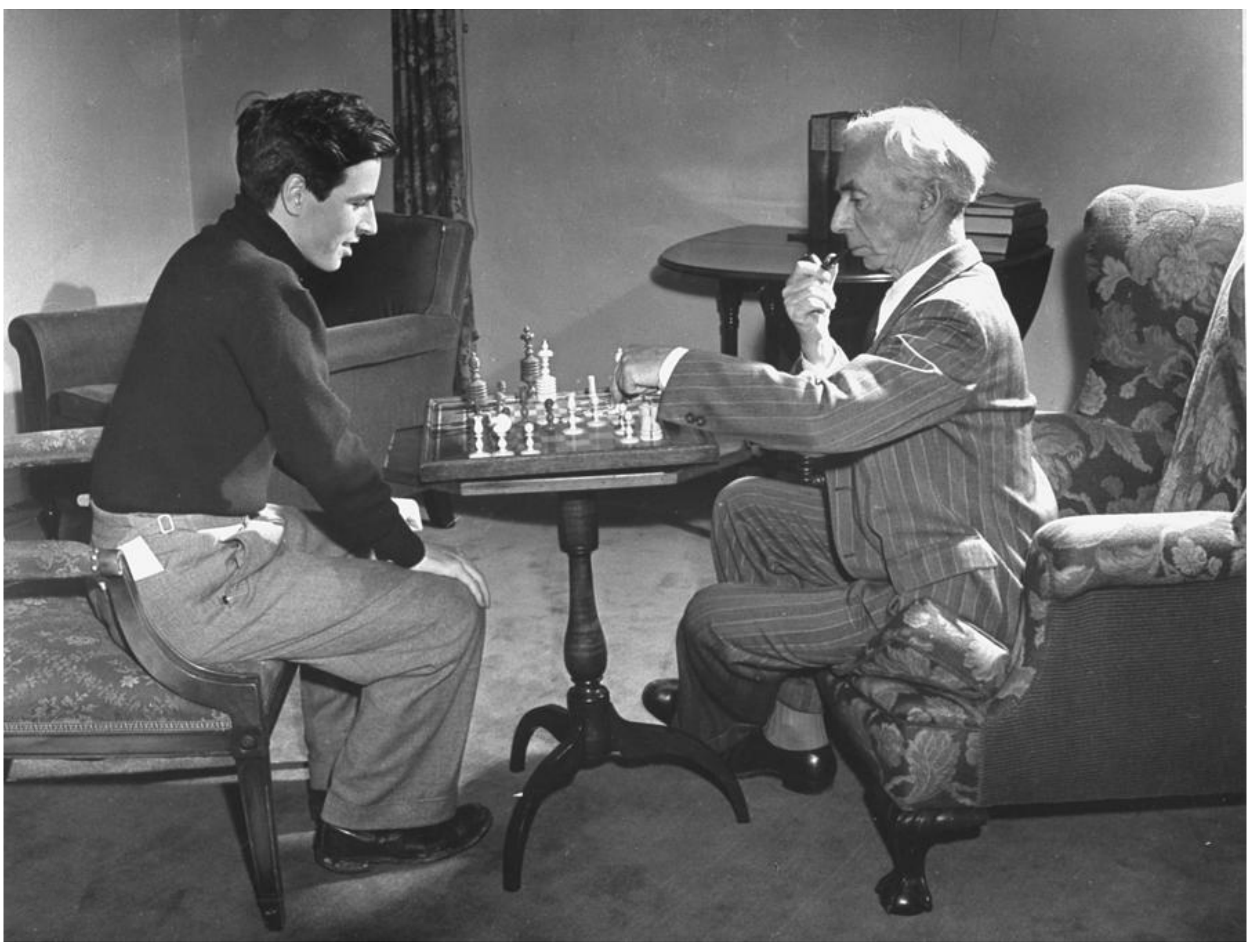
FEBRUARY 2024, NO 168

THE BERTRAND RUSSELL SOCIETY BULLETIN

In this issue



Bertrand Russell playing chess with John Conrad Russell
Source: Peter Stackpole, *Life* magazine, 1940

A note of thanks!

BY PETER STONE

Greetings from Ireland! I just wanted to share a picture of me with my Lee Eisler Service Award plaque. Many thanks for sending it along to me, although the plaque experienced an epic journey getting to me. (The blame rests with the custom charges by the Irish postal service, not with the BRS.) As a BRS member for over 30 years, I greatly appreciate the recognition, and am particularly grateful to receive an award named for Lee Eisler. I joined the BRS in 1991 in response to a magazine advertisement placed by Lee, acting in his capacity as long-time Vice President/Information. Soon after I joined, I received my first issue of the *Russell Society News*, mailed to me by long-time editor. . . Lee Eisler. I still believe the BRS has not fully recovered from the loss of Lee's indefatigable efforts at both these tasks.

I had the additional pleasure, soon after joining, of attending both the Annual Meeting of the BRS and a special dinner in honour of Russell's birthday. Both events took place in the Lehigh Valley, PA, where my family still resides. The birthday dinner, held at Louie's Restaurant in Allentown (sadly now closed), was organized by...Lee Eisler. I wish every new member could benefit from the efforts of so dedicated and enthusiastic a Russellian as Lee.

Sadly, Lee is no longer with us, although his wife Jan remains a BRS member. (She attended the BRS Annual Meeting for the first time in 1991, just as I did.) But I will always be grateful for his efforts. And I'm deeply honoured to receive a prize named after him. Thanks.

Peter Stone holding his Lee Eisler Service Award
Source: Peter Stone

Tea and Bradbury

BY TIM MADIGAN

> If I were asked to describe my ideal “intellectual-with-a-small i" I would do it thus: a person who can start an evening with Shakespeare, continue with [Fu] Manchu and James Bond, jog further with Robert Frost, cavort with Moliere and Shaw, sprint with Dylan Thomas, dip into Yeats, watch *All in the Family* and *Johnny Carson* and finish up the morning with Loren Eiseley, Bertrand Russell and the collected cartoon work of Johnny Hart’s B.C. – Ray Bradbury (Eller, 2020: p. 51).

On March 13, 1954 Bertrand Russell wrote a letter to the London publishers of American author Ray Bradbury (1920-2012), praising his recent novel Fahrenheit 451, and enclosing with it a photo of Russell, pipe in hand, with a copy of the book on the arms of his reading chair. (The photo became one of Bradbury’s most cherished possessions.) Russell wrote:

> Dear Mrs. Simon,
>
> Thank you for your letter of March 8 and for Ray Bradbury’s book *Fahrenheit 451*. I have now read the book and found it powerful. The sort of future society that he portrays is only too possible. I should be glad to see him at any time convenient to us both, and perhaps you might ask him to ring me up when he returns from Ireland and then we can fix a time.
>
> Yours sincerely,
>
> Russell (Eller, 2014: p. 115).

Unbeknownst to Russell, Bradbury–a Los Angeles native who hated to fly and seldom left the United States–was not in Ireland, where he had gone by ship from America to work with director John Huston on the screenplay for Huston’s film adaptation of *Moby Dick*, but was in fact in London at the time, on route to joining his family on a vacation in Italy. After reading the letter at his publisher’s office Bradbury called the telephone number on it and spoke with Russell, letting him know that he would love to meet but that, unfortunately, it would have to be that very day, April 11, as he had to leave London the next day to meet his wife and daughters in Sicily. Bradbury feared that he was being presumptuous for insisting on a visit at such short notice, but was delighted when Russell said that that would be fine.

Bradbury described his visit in a chapter published in his 2005 book *Bradbury Speaks: Too Soon from the Grave, Too Far from the Stars*, entitled “Lord Russell and the Pipsqueak.” He wrote: “So promptly at 7:00 P.M. I left Victoria Station and was hurled forward much too quickly for my rendezvous with the world’s greatest living mind. On the way I was struck a tremendous blow. What, my God, would I say to Lord Russell? Hello? How’s things? What’s new? Good Gravy and Great Grief! My soul melted to caterpillar size and refused the gift of wings” (Bradbury, 2006: pp. 78-79).

Bradbury, a self-educated man who had never attended college, and who freely admitted that most of his knowledge of philosophy came from reading Russell’s 1945 *A History of Western Philosophy*, was trepidatious that he might be asked his opinion of Nietzsche or Schopenhauer or, worst of all, Sartre, whose novel *Nausea* he had recently tried to read “only to wind up with feelings befitting the title” (ibid, 79).

Much to Bradbury’s relief, the subject of philosophy never came up during the brief meeting, which was rather fortunate, since—according to Bradbury’s biographer Jonathan Eller—the philosopher he was most intrigued to learn about in the book was Henri Bergson, whose metaphysical views on time and space were not exactly in accord with Russell’s.

Russell opened the door of his flat and introduced Bradbury to his wife Edith. In Bradbury's reminiscences of the visit she is portrayed as a mostly silent presence, sitting and knitting in the background like Madame Defarge while the two men conversed. Like most Americans at the time Bradbury was not a tea drinker, and was appalled by the "heavily milked and sugared" concoction served to him by his host, but he was polite enough to drink it anyway.

In order to forestall a deep intellectual discussion he felt ill-prepared to venture into, Bradbury came up with a brilliant opening gambit—praising Russell's recent short story collections, *Satan in the Suburbs* (1953) and *Nightmares of Eminent Persons and Other Stories* (1954). He exulted:

> "Lord Russell, I predicted to friends years ago that if you ever turned your talent to short fiction, it would be to the fantastic and science-fictional manner of H.G. Wells. How else could a thinker write than in a scientifically philosophical mode?"

In other words, he laid it on thick, since—as an accomplished writer of fiction—Bradbury recognized that in fact this was not one of Russell's strong points. Russell was pleased, nodding and saying "yes, yes, of course you were absolutely correct." Bradbury, knowing that the books had not sold as well as Russell's nonfiction writings or been particularly well received by critics, added that "Since I was one of the few in the entire United States who had bought his tales I was now the rare expert and expounded on their qualities" (ibid, p. 80). He had found the stories themselves to be thought-provoking, but the character portrayals in them to be anemic and the settings to be perfunctory. "Bertrand Russell was, in sum, a bright amateur seeking but rarely finding the dramatic effect, accomplished only in jump-starting brilliant fancies but failing to breathe them into satisfactory lives" (ibid). This was not a criticism he related out loud to the author, however, instead focusing on the concepts found within. "Was I duplicitous? No, simply young and eager to please the master" (ibid). It should be pointed out that Bradbury was, as he himself described it, "a teenage thirty-three" at the time, so referring to himself as young was rather charitable, but he was almost 50 years the junior of the then 82-year old Russell, so perhaps he felt young in comparison.

Russell then rescued his visitor by turning the tables on him, asking about his ongoing work on the *Moby Dick* screenplay and how one could possibly attempt to adapt such a classic novel into a movie. Much of the rest of the essay consists of Bradbury's discussions on how he and Huston had grappled with this problem, with the former stating that it was his own naïveté that led him to tackle such a monumental task. "At which point, Lady Russell paused from her soundless knitting, fixing me with a steady and unrelenting stare, and said, 'Let us not be too naïve, shall we?' And was silent for the rest of my stay" (ibid, p. 81). Lord Russell then came to his rescue by asking him more questions about "the mysteries of film creation." There may have been a reason for this, as the Russells were interested in the possibility of adapting Bertrand's short stories to the big screen, but Bradbury—whose sole movie script credit would be for the *Moby Dick* film—was genuinely in the dark about arranging such matters, since he had uniquely been chosen specifically by the noted director Huston as the screenwriter, and had no general advice on what needed to be done to have one's works adapted for the movies. Fortunately for him, the author he was adapting was long dead.

The evening ended well, with Bradbury having to rush to meet the last train back to his get to his hotel. But Bradbury couldn't help but note that the meeting had not been as auspicious as he had hoped it would be. He ends his essay by musing:

> On the train rushing back to London, I cursed everything I had dared to say, much as on those nights when, taking some young woman home from a cheap film, I had hesitated at her door and backed off

> without so much as pressing her hand, crushing her bosom, or kissing her nose, then cursing, damning my gutless will, walking home, alone, always alone, wordless and miserable (ibid, 85).

This feeling that somehow there was not as strong a connection as he had desired is confirmed by Eller in his biography, who quotes a letter Bradbury wrote to a friend shortly thereafter:

> I may have hit Russell on an off evening. I may have had little to give him, being constrained myself. In an event, while it was a nice evening, it didn't have that sort of feeling where your own champagne-bubbles foam up behind the eyes while you're taking to people you're really at ease with (Eller, 2014: p. 32).

The two men never met again, and in recollecting their sole meeting Bradbury ends his essay by admitting that "even in writing this, suppressing my naïveté is one more act of pride to which Lady Russell is my ghost confessor" (ibid, p. 86). If indeed Bradbury's recollections, written many decades after the fact, are accurate, there is a sense of lost opportunity, since in addition to Bradbury's work on the *Moby Dick* script there was another topic at hand that seemed a natural for them to discuss: Bradbury's current best-selling novel *Fahrenheit 451* and the warnings in it that Russell had found "all too possible."

One reason no doubt why Russell had admired the novel enough to invite its author to meet him was due to the fact that he himself appeared in it. Towards the end of the novel we read:

> Some of us live in small towns. Chapter One of Thoreau's *Walden* in Green River, Chapter Two in Willow Farm, Maine. Why, there's one town in Maryland, only twenty-seven people, no bomb'll ever touch that town, is the complete essays of a man named Bertrand Russell. Pick up that town, almost, and flip the pages, so many pages to a person (Bradbury, 1953: p. 150).

Russell's genius, Bradbury wrote in his recollection of his London visit "was in the essay, grand and minute, not in character portrayal or the delineation of master scenes" (Bradbury, 2005: p. 80). Perhaps that is why the essays of Russell were what were memorized in his novel. Bradbury was well-known in science fiction circles but not yet world famous in 1953 when he wrote the book, in part as a protest against the then-ongoing House UnAmerican Activities Committee investigations along with those of U.S. Senator Joseph McCarthy on alleged Communists and subversives, which Bradbury considered to be a modern "witch hunt." While an opponent of the totalitarian regime of the Soviet Union, Bradbury also opposed using totalitarian tactics in a democratic society. David Seed point out that

> Bradbury has repeatedly made the purpose of his novel clear, considering it a "direct attack against the sort of thing he [McCarthy]stood for," and in a 1970 interview he expanded on this: "Well, that all came about during the Joseph McCarthy era...Everybody sort of sat around and let McCarthy throw his weight around and nobody was brave. So I got angry at the whole thing and said to myself that I didn't approve of book burning; I didn't approve of it when Hitler did it, so why should I be threatened about it by McCarthy?" (Seed, 2015, p. 87).

Fahrenheit 451 ("the temperature at which paper catches fire and burns" according to its opening words) is the story of a future dystopian society where buildings are fireproof and firemen don't put out blazes but rather set them, burning supposed subversive literature on orders of the State. The lead character, Montag, is a fireman who becomes intrigued by what he has been ordered to destroy and hides a copy of a particular book—the Bible.

The story is eerily prescient, with full screen TVs in everyone's home, mind-numbed viewers satiated by nonstop entertainment programs, and the constant surveillance of citizens. Montag is turned in to the authorities by his own wife, but escapes just before a "limited nuclear attack" destroys his town. He meets up with a group of fellow renegades, who tell him that there are people like themselves throughout society who have memorized many works, including the aforementioned essays of Russell, in order to preserve them for posterity, and that he should join them in their efforts. "And when the war's over, someday, some year, the books can be written again, the people will be called in, one by one, to recite what they know and we'll set it up in type until another Dark Age, when we might have to do the whole damn thing over again. But that's the wonderful thing about man; he never gets so discouraged or disgusted that he gives up doing it all over again, because he knows very well it is important and worth the doing" (Bradbury, 1953: pp. 150-151).

The novel caught on, continuing to sell in large numbers right up to the present day, and remains Bradbury's best-known work. This is not surprising since censorship is still, sadly, an ever-present topic, as Seed affirms:

> Given the subject of *Fahrenheit 451*, it is a supreme irony that in 1967, unbeknownst to Bradbury, the editors at Ballantine bowdlerized the novel for a high school edition, removing references to nudity and drinking and also expletives. Although the original text was restored in 1980, the novel's acceptance in the classroom continues to be widely debated on U.S. high school boards (Seed, 2015, p. 121).

It therefore seems odd that the constant need to defend freedom of speech was not one of the issues that Bradbury and Russell discussed during their sole meeting. Still, the visit was a brief one, and Bradbury's recollections so many years afterwards might not be completely accurate. Though Bradbury suffered from his opposition to McCarthyism, being investigated by the FBI and having various lecture appearances unexpectedly cancelled by authorities after the novel's publication, his own interpretation of the meaning of *Fahrenheit 451* changed over time. According to Eller, Bradbury gave different reasons for what motivated him to write it and what he thought its continuing significance was. Like many liberals (but unlike Russell) Bradbury became increasingly conservative as he aged, and by the time he was himself in his 80s he was praising Presidents Ronald Reagan and the two Bushes and arguing that his novel was a warning against the dangers of "political correctness."

Whatever the author's intentions may have been, *Fahrenheit 451* is still relevant to the present day. Book banning and even book burning continue, both from the Left and from the Right. In addition, the need to defend literacy, another central theme of Fahrenheit 451, takes on greater poignancy in the electronic age of the present. Television was in its infancy when the book described gigantic screens and 24-hour programming of mindless entertainment. David Seed writes that:

> Bradbury's intermittent commentary on his novel has consistently stressed the continuing relevance of its critical engagement with the media long after the specific paranoia of the McCarthy era had passed. In a 1998 interview, he stated that "almost everything in *Fahrenheit 451* has come about, one way or the other—the influence of television, the rise of local TV news, the neglect of education." And in 2007, on the occasion of receiving a Pulitzer Prize, he denied that it was about government censorship so much as "how television destroys interest in reading literature." This happens

> through the transmission of "factoids," gobbets of useless information without context (Seed, 2015: p. 121).

Seed goes on to say that Bradbury viewed his novel not as a prediction of the future but rather as a warning against possible futures. It's nice to know that Bertrand Russell played a role in inspiring him in his defense of freedom of thought, and that whoever now reads the novel will see a reference to "a man named Bertrand Russell" and may be inspired in turn to read his collected essays and other works—even his fiction!

References

Bradbury, Ray, 1953. *Fahrenheit 451*. New York: Ballantine Books.

Bradbury, Ray, 2006. *Bradbury Speaks: Too Soon from the Cave, Too Far from the Stars*. New York: Harper Perennial.

Eller, Jonathan R., 2011. *Becoming Ray Bradbury*. Urbana, Chicago, and Springfield: University of Illinois Press.

Eller, Jonathan, R., 2014. *Ray Bradbury Unbound*. Urbana, Chicago, and Springfield: University of Illinois Press.

Eller, Jonathan R., 2020. *Beyond Apollo*. Urbana, Chicago, and Springfield: University of Illinois Press.

Seed, David, 2015. *Ray Bradbury*. Urbana, Chicago, and Springfield: University of Illinois Press.

A Note on *Principia*'s Most Famous Theorem

BY RODRIGO FERREIRA

To say that *Principia Mathematica* is a famous work on logic is a severe understatement, given its unmatched influence in the development and popularization of the subject. Its fame is well-deserved. As the historian of Logic and Mathematics and authoritative scholar of *Principia* Ivor Grattan-Guinness once noted (*Grattan-Guinness 2000*, p.388):

> As a technical exercise *Principia* is a brilliant *virtuoso* performance, maybe unequalled in the histories of both mathematics and logic; the chain-links of theorems are intricate, the details recorded Peano-style down to the last cross-reference, seemingly always correctly.

Were one asked, then, to name *Principia*'s *most famous* theorem/proposition, what would it be? Well, from novice students to seasoned logicians, the most likely answer will be: the one which proves that $1+1=2$. And if we were to ask someone who is at some level familiar with *Principia*'s text—including professional logicians and philosophers—where exactly this proof is to be found, chances are that the answer will be the following famous snippet from Volume 1, Part II, Section, A, Number $*54$, p.362:

$$*54{\cdot}43.\quad \vdash :. \alpha, \beta \in 1 \,.\, \supset : \alpha \cap \beta = \Lambda \,.\, \equiv \,.\, \alpha \cup \beta \in 2$$

Dem.

$$\vdash . *54{\cdot}26 . \supset \vdash :. \alpha = \iota\text{'}x \,.\, \beta = \iota\text{'}y \,.\, \supset : \alpha \cup \beta \in 2 \,.\, \equiv . x \neq y \,.$$

$$[*51{\cdot}231] \qquad \equiv . \iota\text{'}x \cap \iota\text{'}y = \Lambda \,.$$

$$[*13{\cdot}12] \qquad \equiv . \alpha \cap \beta = \Lambda \qquad (1)$$

$$\vdash . (1) . *11{\cdot}11{\cdot}35 . \supset$$

$$\vdash :. (\exists x, y) . \alpha = \iota\text{'}x \,.\, \beta = \iota\text{'}y \,.\, \supset : \alpha \cup \beta \in 2 \,.\, \equiv . \alpha \cap \beta = \Lambda \qquad (2)$$

$$\vdash . (2) . *11{\cdot}54 . *52{\cdot}1 . \supset \vdash . \text{Prop}$$

Now, we'll see in a second why the definite description "the proposition in *Principia* that proves $1+1=2$" does not refer to the above theorem (there is more than one reason!); before that, it is interesting to note that this little misunderstanding crops ups in a lot of places. A Google image search for "*Principia Mathematica* $1+1=2$" leads immediately to pictures of page 362. Two other fun cases are worth mentioning: Bertie and *Principia*'s theorem $*54{\cdot}43$ were the subject of brief discussion in episode 1 of the *F*-series of the British television panel game show *Quite Interesting* presented by Stephen Fry; on page 179 of the popular and quite entertaining comicbook *Logicomix: An Epic Search for Truth* by Apostolos Doxiadis and Christos Papadimitriou, we find Russell standing in a classroom with a portion of the proof of theorem $*54{\cdot}44$ (i.e., the theorem that *follows* $*54{\cdot}43$ on page 362) projected into a chalkboard behind him. In both cases it is taken for granted that $1+1=2$ is proved in $*54$. More problematic, however, is the fact that this little misunderstanding also appears in scholarly works. For instance, in Mathieu Marion's essay *Wittgenstein on the Surveyability of Proofs*, we find the assertion that $*54{\cdot}43$ "[...] is the *Principia* equivalent of $1+1=2$" (pp.142-3).

One quickly finds that this is just wrong. Close attention to the "prose" that follows the above proof makes this clear (*Principia* vol 1, p.362, our emphasis):

From this proposition *it will follow, when arithmetical addition has been defined, that* $1 + 1 = 2$.

Whitehead and Russell appear to be telling us that the above is a *lemma* for $1 + 1 = 2$, not the result itself. Indeed, the actual theorem appears in Volume 2, Part III, Section B, Number $*110$, p.83:

$$*110{\cdot}643.\ \vdash .\ 1 +_c 1 = 2$$

Dem.

$$\begin{aligned}
&\vdash .\ *110{\cdot}632 .\ *101{\cdot}21{\cdot}28 .\ \supset \\
&\vdash .\ 1 +_c 1 = \hat{\xi}\{(\exists y) .\ y \in \xi .\ \xi - \iota`y \in 1\} \\
&[*54{\cdot}3] \quad = 2 .\ \supset \vdash .\ \text{Prop}
\end{aligned}$$

This one, on its turn, is accompanied by the following (also very famous) remark:

The above proposition is occasionally useful. It is used at least three times, in $*113{\cdot}66$ and $*120{\cdot}123{\cdot}472$.

As interesting as the joke accompanying it, however, is the fact that no reference to $*54{\cdot}43$ is made in the proof!

In fact, if we check the proofs of the first three theorems referenced in the proof of $*110{\cdot}643$, none of them refer us back to $*54{\cdot}43$ and the fourth is a theorem that precedes $*54{\cdot}43$, namely $*54{\cdot}3$, which is thus the actual proposition from number $*54$ explicitly used as a lemma to show that $1 + 1 = 2$. A closer look, however, reveals that there is a common reference in the proofs of both $*54{\cdot}3$ and $*54{\cdot}43$, namely $*51{\cdot}231$, whose proof is given as follows (PM, vol 1, p343):

$$*51{\cdot}231.\ \vdash : \iota`x \cap \iota`y = \Lambda .\ \equiv .\ x \neq y$$

Dem.

$$\begin{aligned}
&\vdash .\ *24{\cdot}311 .\ \supset \vdash :.\ \iota`x \cap \iota`y = \Lambda .\ \equiv : \iota`x \subset - \iota`y : \\
&[*51{\cdot}15] \qquad \equiv : z = x .\ \supset_z .\ z \neq y : \\
&[*13{\cdot}191] \qquad \equiv : x \neq y :.\ \supset \vdash .\ \text{Prop}
\end{aligned}$$

The above may be thus regarded as the proper lemma for $1 + 1 = 2$[1]. We'll get back to this proof in a moment; for now, enough fact-checking!

Why are these proofs famous, anyway? Well, they *seem* to corroborate a particular way of facing the technical intricacy and virtuosity of *Principia*—not as one of appreciation like in the case of Grattan-Guinness—but as one of exagerated emphasis on the work's excessive or even "dizzying" complexity (cf. *Monk 1999*, p.50). In a nutshell, these theorems are notorious because they suggest the idea that *Principia*'s development of Mathematics is so complex that it requires hundreds of pages of build-up to establish the barest of mathematical results. To be sure, this way of looking at the work provides an entertaining narrative, but it is a very misleading one.

Right off the bat, let it be clear that one can easily get a proof of $1 + 1 = 2$ in *Principia*-style Arithmetic. For the fun of it, let us sketch a proof using $*54{\cdot}43$ as a lemma, making good of Whitehead and Russell's claim that follows the proof of that theorem. We may begin by adapting *Principia*'s slightly more complicated definitions[2], taking 1 and the successor $\mu +_c 1$ of a given cardinal number μ to be defined as follows: $1 =_{\text{Df}} \{\alpha : (\exists x)(\alpha = \{x\})\}$; $2 =_{\text{Df}} \{\alpha : (\exists x, y)(x \neq y \wedge \alpha = \{x\} \cup \{y\})\}$ and $\mu +_c 1 =_{\text{Df}} \{\gamma : (\exists y)(y \in \gamma \wedge \gamma - \{y\} \in \mu)\}$. Proposition $\ast 54{\cdot}43$ is proved as follows, using proposition $\ast 51{\cdot}231$ ($\{x\} \cap \{y\} = \Lambda \equiv x \neq y$) as a lemma:

> Assume $\alpha, \beta \in 1$. Then for some x, y $\alpha = \{x\}$ and $\beta = \{y\}$. Assume $\alpha \cap \beta = \Lambda$. Then, by $\ast 51{\cdot}231$, we have $x \neq y$. But then, by the definition of 2 as $\gamma\{(\exists x, y)(x \neq y \wedge \gamma = \{x\} \cup \{y\})\}$, we have $\{x\} \cup \{y\} \in 2$ and thus $\alpha, \beta \in 1 \supset (\alpha \cap \beta = \Lambda \supset \alpha \cup \beta \in 2)$. Conversely, assume $\alpha, \beta \in 1$ and $\alpha \cup \beta \in 2$. By the definition of 1, $\alpha = \{x\}$ and $\beta = \{y\}$ and by the definition of 2 we have $x \neq y$. But then, by $\ast 51{\cdot}231$, we have $\alpha \cap \beta = \Lambda$. Thus: if $\alpha, \beta \in 1$, then $\alpha \cup \beta \in 2$ iff $\alpha \cap \beta = \Lambda$, as intended.

Next we want $\ast 110{\cdot}643$ using $\ast 54{\cdot}43$. What we need to show is that $\gamma \in 1 + 1$ iff $\gamma \in 2$. So:

> Let $n +_c 1$ be $\{\gamma : (\exists x)(x \in \gamma \wedge \gamma - \{x\} \in n)\}$. Then $1 +_c 1$ is $\{\gamma : (\exists x)(x \in \gamma \wedge \gamma - \{x\} \in 1)\}$. Assume $\gamma \in 2$, that is $(\exists x)(\exists y)(x \neq y \wedge \gamma = \{x\} \cup \{y\})$. If $x \neq y$ and $\gamma = \{x\} \cup \{y\}$,then $\gamma - \{x\} = \{y\}$. By definition, $\{y\} \in 1$, and since $\gamma - \{x\} = \{y\}$ (given that $\gamma = \{x\} \cup \{y\}$), we have $\gamma - \{x\} \in 1$. Thus, we have $(\exists x)(x \in \gamma \wedge \gamma - \{x\} \in 1)$. Therefore: if $\gamma \in 2$, then $\gamma \in 1 +_c 1$. Conversely, assume $\gamma \in 1 +_c 1$, that is, $(\exists x)(x \in \gamma \wedge \gamma - \{x\} \in 1)$. If $(\exists x)(x \in \gamma \wedge \gamma - \{x\} \in 1)$, then $(\exists x)(\exists y)(x \in \gamma \wedge \gamma - \{x\} = \{y\})$. By lemma $\ast 54{\cdot}43$, we have $\{x\}, \{y\} \in 1 \supset (\{x\} \cap \{y\} = \Lambda \equiv \{x\} \cup \{y\} \in 2)$. By definition, for any *x* and *y*, $\{x\}, \{y\} \in 1$ is true. Thus: $\{x\} \cap \{y\} = \Lambda \equiv \{x\} \cup \{y\} \in 2$. If $x \in \gamma \wedge \gamma - \{x\} = \{y\}$, then $x \neq y$. But if $x \neq y$, then $\{x\} \cap \{y\} = \Lambda$ and, therefore, $\{x\} \cup \{y\} \in 2$. Since $\{x\} \cup \{y\} = \gamma$, it follows that $\gamma \in 2$. And so we're done with the proof of $1 + 1 = 2$.[3]

Now, there are some things we may observe about the above reconstruction of the proof. It is not very simple and due to the lack of mathematical elegance of its current presenter, it is indeed rather clumsy. More to the point, however: it is not eight hundred pages long. To be sure, we do not have here a formal proof and several steps were either omitted or taken for granted, but providing a full formalization—going back to a few definitions and laws of (higher-order) predicate logic and unpacking a full *Principia*-style proof with complete cross-references is a worthwhile exercise that we must leave for another occasion[4]: the relevant point is that there is no excessive or "dizzying" complexity in the reasoning above—at least no more than one finds in routine set theoretical proofs.[5]

Another obvious point one can bring to dispel all the hullabaloo surrounding $\ast 54{\cdot}43$ is just that there is a lot more going on in PM's first eight hundred pages than preparation for basic Arithmetic. To give just *one* striking example: in the first volume of *Principia* (numbers $\ast 73$ and $\ast 94$) Whitehead and Russell present two detailed formal proofs of the (famously difficult to prove) Cantor-Schröder-Bernstein theorem. You won't find *that* in a child's Arithmetic schoolbook!

Appendix

For the interested reader, in what follows I provide a reconstruction of the formal proofs of the main theorems discussed in this note, accompanied by (very brief) comments and using *Principia*'s original notation[6]. Steps or inferences that concern elementary logic (i.e., propositional logic and quantification theory with identity) are only noted or taken in consideration in the annotation of the proofs when that is also the case in *Principia*'s original annotation, otherwise they are simply taken for granted (substitution of equivalents, in particular, is applied directly throughout). No theorem is referenced unless it appears in PM's original annotation. A very small omission is noted and a correction is suggested in the commentary of $*51{\cdot}231$.

First and foremost, we have:

$*51{\cdot}231 \vdash . \iota\text{`}x \cap \iota\text{`}y = \Lambda . \equiv . x \neq y$

Dem.

$[*24{\cdot}311]$	$\vdash \alpha \cap \beta = \Lambda . \equiv . \alpha \subset -\beta$	(1)
$(1)\left[\dfrac{\iota\text{`}x, \quad \iota\text{`}y}{\alpha, \quad \beta}\right]$	$\vdash \iota\text{`}x \cap \iota\text{`}y = \Lambda . \equiv . \iota\text{`}x \subset -\iota\text{`}y$	(2)
$[(2)]$	$\vdash \iota\text{`}x \cap \iota\text{`}y = \Lambda : \equiv . z \in \iota\text{`}x . \supset_z . z \sim\in \iota\text{`}y$	(3)
$[*51{\cdot}15]$	$\vdash z \in \iota\text{`}x . \equiv . z = x$	(4)
$[(3) . (4)]$	$\vdash \iota\text{`}x \cap \iota\text{`}y = \Lambda : \equiv . z = x . \supset_z . z \sim\in \iota\text{`}y$	(5)
$[*51{\cdot}15]$	$\vdash z \in \iota\text{`}y . \equiv . z = y$	(6)
$[(6)]$	$\vdash z \sim\in \iota\text{`}y . \equiv_z . z \neq y$	(7)
$[(5) . (7)]$	$\vdash \iota\text{`}x \cap \iota\text{`}y = \Lambda : \equiv . z = x . \supset_z . z \neq y$	(8)
$*13{\cdot}191\left[\dfrac{\hat{x} \neq y}{\phi\hat{x}}\right]$	$\vdash z = x . \supset_z . z \neq y : \equiv . x \neq y$	(9)
$[(8) . (9)]$	$\vdash \iota\text{`}x \cap \iota\text{`}y = \Lambda . \equiv . x \neq y$	(Prop)

Commentary: This is referenced in the proofs of $*54{\cdot}3$ and $*54{\cdot}43$. There seems to be a small omissionn in this proof as it stands. *Principia*'s unpacked proof goes from line (3), which is obtained by instantiating $*24{\cdot}311$, directly to line (8), via $*51{\cdot}15$. The omission is located in the intermediate step from line (2) to (3): besides elementary logic, one needs something from the calculus of classes to unpack "$\iota\text{`}x \subset -\iota\text{`}y$". The simplest solution, it seems, would be to start the proof with $*24{\cdot}39$ (i.e., $\alpha \cap \beta = \Lambda : \equiv . z \in \alpha . \supset_z . z \sim\in \beta$) instead of $*24{\cdot}311$, instantiating it as $\iota\text{`}x \cap \iota\text{`}y = \Lambda : \equiv . z \in \iota\text{`}x . \supset_z . z \sim\in \iota\text{`}y$. This gets the proof through since it yields line (3) above directly. The lines/steps that appear explicitly in *Principia*'s original proof correspond to lines (2), (7) and (Prop.) above. The theorem schemata of quantification with identity referenced in the annotation of line (9) is $((y)(x = y \supset \phi y) \equiv \phi x)$. The substitutions in lines (2) and (9) are not explicitly given in PM's annotation.

Next, we have:

$*54{\cdot}3 \vdash . 2 = \hat{\alpha}\{(\exists x) . x \in \alpha . \alpha - \iota'x \in 1\}$

Dem.

$[*52{\cdot}1]$	$\vdash \beta \in 1 . \equiv . (\exists y) . \beta = \iota'y$	(1)
$(1)\left[\frac{\alpha - \iota'x}{\beta}\right]$	$\vdash \alpha - \iota'x \in 1 . \equiv . (\exists y) . \alpha - \iota'x = \iota'y$	(2)
$[(1) . (2)]$	$\vdash (\exists x) . x \in \alpha . \alpha - \iota'x \in 1 . \equiv . (\exists x) : x \in \alpha . (\exists y) . \alpha - \iota'x = \iota'y$	(3)
$[(3) . (*10{\cdot}35)]$	$\vdash (\exists x) . x \in \alpha . \alpha - \iota'x \in 1 . \equiv . (\exists x, y) . x \in \alpha . \alpha - \iota'x = \iota'y$	(4)
$[*51{\cdot}22]$	$\vdash \iota'x \cap \alpha = \Lambda . \iota'x \cup \alpha = \beta . \equiv . x \in \beta . \beta - \iota'x = \alpha$	(5)
$(5)\left[\frac{\iota'y, \quad \alpha}{\alpha, \quad \beta}\right]$	$\vdash \iota'x \cap \iota'y = \Lambda . \iota'x \cup \iota'y = \alpha . \equiv . x \in \alpha . \alpha - \iota'x = \iota'y$	(6)
$[(4) . (6)]$	$\vdash (\exists x) . x \in \alpha . \alpha - \iota'x \in 1 . \equiv . (\exists x, y) . \iota'x \cap \iota'y = \Lambda . \iota'x \cup \iota'y = \alpha$	(7)
$[*51{\cdot}231]$	$\vdash \iota'x \cap \iota'y = \Lambda . \equiv . x \neq y$	(8)
$[(7) . (8)]$	$\vdash (\exists x) . x \in \alpha . \alpha - \iota'x \in 1 . \equiv . (\exists x, y) . x \neq y . \iota'x \cup \iota'y = \alpha$	(9)
$[*54{\cdot}101]$	$\vdash \alpha \in 2 . \equiv . (\exists x, y) . x \neq y . \alpha = \iota'x \cup \iota'y$	(10)
$[(9) . (10)]$	$\vdash \alpha \in 2 . \equiv . (\exists x) . x \in \alpha . \alpha - \iota'x \in 1$	(11)
$[(11)]$	$\vdash 2 = \hat{\alpha}\{(\exists x) . x \in \alpha . \alpha - \iota'x \in 1\}$	(Prop)

Commentary: This is the proposition that is actually referenced in the proof of theorem $*110{\cdot}643$. The lines/steps that appear explicitly in *Principia*'s original proof correspond to lines (4), (7) and (Prop.) above. The theorem schemata referenced in the annotation of line (4) is $(\exists x)(p \wedge \phi x) \equiv (p \wedge (\exists x)\phi x)$ (provided x does not occur free in p.[7] The substitution in line (2) is not explicitly given in *Principia*'s annotation.

Next, we have:

$*54{\cdot}43 \vdash . \alpha, \beta \in 1 . \supset : \alpha \cap \beta = \Lambda . \equiv . \alpha \cup \beta \in 2$

Dem.

$[*54{\cdot}26]$	$\vdash \iota'x \cup \iota'y \in 2 . \equiv . x \neq y$	(1)
$[(1)]$	$\vdash \alpha = \iota'x . \beta = \iota'y . \supset : \alpha \cup \beta \in 2 . \equiv . x \neq y$	(2)
$[*51{\cdot}231]$	$\vdash \iota'x \cap \iota'y = \Lambda . \equiv . x \neq y$	(3)
$[(2) . (3)]$	$\vdash \alpha = \iota'x . \beta = \iota'y . \supset : \alpha \cup \beta \in 2 . \equiv . \iota'x \cap \iota'y = \Lambda$	(4)
$[(4) . (13{\cdot}12)]$	$\vdash \alpha = \iota'x . \beta = \iota'y . \supset : \alpha \cup \beta \in 2 . \equiv . \alpha \cap \beta = \Lambda$	(5)
$[(5) . (*11{\cdot}11)]$	$\vdash (x, y) :. \alpha = \iota'x . \beta = \iota'y . \supset : \alpha \cup \beta \in 2 . \equiv . \alpha \cap \beta = \Lambda$	(6)
$[(6) . (*11{\cdot}35)]$	$\vdash (\exists x, y) . \alpha = \iota'x . \beta = \iota'y . \supset : \alpha \cup \beta \in 2 . \equiv . \alpha \cap \beta = \Lambda$	(7)
$[*11{\cdot}54]$	$\vdash (\exists x, y) . \alpha = \iota'x . \beta = \iota'y . \equiv . (\exists x) . \alpha = \iota'x . (\exists y) . \beta = \iota'y$	(8)
$[(7) . (8)]$	$\vdash (\exists x) . \alpha = \iota'x . (\exists y) . \beta = \iota'y . \supset : \alpha \cup \beta \in 2 . \equiv . \alpha \cap \beta = \Lambda$	(9)
$[*52{\cdot}1]$	$\vdash (\exists x) . \alpha = \iota'x . (\exists y) . \beta = \iota'y . \equiv . \alpha, \beta \in 1$	(10)
$[(9) . (10)]$	$\vdash \alpha, \beta \in 1 . \supset : \alpha \cup \beta \in 2 . \equiv . \alpha \cap \beta = \Lambda$	(Prop)

Commentary: This is likely *Principia*'s most famous proof. The theorem could have been used as a lemma to prove $*110{\cdot}643$, but it wasn't. The lines/steps that appear explicitly in *Principia*'s original proof correspond to lines (2), (4), (5), (7) and (Prop.) above. In slightly friendlier notation or terminology, the theorem schemata and rules of quantification theory with identity referenced in the annotation of lines (5), (6), (7) and (8) are, respectively, the following: $x = y \supset (\psi x \equiv \psi y)$; universal generalization; $(x)(y)(p \supset \phi xy) \equiv (p \supset (\exists x)(\exists y)\phi xy)$ and $(\exists x)(\exists y)(\phi x \wedge \psi y) \equiv ((\exists x)\phi x \wedge (\exists y)\psi y)$. The substitution in line (2) is not explicitly given in *Principia*'s annotation.

Finally, we have:

$*110{\cdot}643 \vdash . \; 1 +_c 1 = 2$

Dem.

$[*110{\cdot}632]$	$\vdash \mu \in \mathrm{NC} \,.\supset.\, \mu +_c 1 = \hat{\xi}\{(\exists y) \,.\, y \in \xi \,.\, \xi - \iota\text{‘}y \in \mathrm{sm}\,\text{“}\mu\}$	(1)
$(1)\left[\dfrac{1}{\mu}\right]$	$\vdash 1 \in \mathrm{NC} \,.\supset.\, 1 +_c 1 = \hat{\xi}\{(\exists y) \,.\, y \in \xi \,.\, \xi - \iota\text{‘}y \in \mathrm{sm}\,\text{“}1\}$	(2)
$[*101{\cdot}21]$	$\vdash 1 \in \mathrm{NC}$	(3)
$[(2) \,.\, (3)]$	$\vdash 1 +_c 1 = \hat{\xi}\{(\exists y) \,.\, y \in \xi \,.\, \xi - \iota\text{‘}y \in \mathrm{sm}\,\text{“}1\}$	(4)
$[*101{\cdot}28]$	$\vdash \mathrm{sm}\,\text{“}1 = 1$	(5)
$[(4) \,.\, (5)]$	$\vdash 1 +_c 1 = \hat{\xi}\{(\exists y) \,.\, y \in \xi \,.\, \xi - \iota\text{‘}y \in 1\}$	(6)
$[*54{\cdot}3]$	$\vdash 2 = \hat{\xi}\{(\exists y) \,.\, y \in \xi \,.\, \xi - \iota\text{‘}y \in 1\}$	(7)
$[(6) \,.\, (7)]$	$\vdash 1 +_c 1 = 2$	(Prop)

Commentary: This is *Principia*'s actual proof that $1 + 1 = 2$. It does not appeal explicitly to $*54{\cdot}43$, but to $*54{\cdot}3$ which, in its turn, depends on $*51{\cdot}231$. The lines/steps that appear explicitly in *Principia*'s original proof correspond to lines (6) and (Prop.) above. The substitution in line (2) is not explicitly given in *Principia*'s annotation.[8]

Notes

[1]I owe this observation to Gregory Landini, who brought my attention to this point.

[2]For details, cf. $*52{\cdot}01$, $*110{\cdot}01{\cdot}02{\cdot}632$.

[3]Or are we? Surely, some interesing questions remain! Could someone in his/her right mind claim that such a proof is what grounds our knowledge on the ordinary proposition $1 + 1 = 2$? Doesn't all this logical engineering somehow already presupposes our knowledge of arithmetic? Isn't the epistemological character of arithmetic much more clear than those of advanced Mathematical Logic (or Set Theory)? Does *Principia*'s "$1 +_c 1 = 2$" in some sense "capture" what we ordinarily mean by "$1 + 1 = 2$"? Does the work aims at doing so? Doesn't the mere existence of different (incompatible) formal renditions of this proposition (say, in ZF Set Theory) show that this is not the case? What would Russell say about these matters? Fun and interesting as these questions are, we must also leave them for another occasion.

[4]A *partial* attempt at this task is given in the appendix.

[5]One should bear in mind, however, that no proof in *Principia* is about sets or classes: the work puts forward a No-Class theory that dispenses completely any ontology of sets or relations-in-extension. For details, cf., for instance, Landini, 2011.

[6]This is done with Landon Elkind's excellent "principia" TEX package. See https://ctan.org/pkg/principia.

[7]Here it must be noted that there is a famous (and still ongoing) debate about PM's use of so-called "propositional letters" (cf. Volume 1, Introduction, p.5). Following Landini (1998, chapter 10), I understand such letters as schemata standing for well-formed formulas of PM's object language, not as genuine variables ranging over propositions. It is also worth noting that PM puts forward two different approaches to elementary quantificational logic where such letters are used differently: in ∗9 propositional letters stand for quantifier-free formulas, while in ∗10 they may also stand for formulas containing variables bound by quanfiers. For a detailed discussion of the philosophical role that section ∗9 plays in PM, cf. Landini 1998, chapter 10.

[8]Thanks to Gregory Landini and Landon D. C. Elkind for their comments, corrections and editorial assistance. In particular, I'm thankful to Gregory for the extensive and encouraging discussions about *PM*.

References

[1] Ferreira, R. S. (2022). *Logic, Ontology, and Arithmetic: A Study of the Development of Bertrand Russell's Mathematical Philosophy from The Principles of Mathematics to Principia Mathematica*. PhD Dissertation. https://lume.ufrgs.br/handle/10183/234787

[2] Grattan-Guinness, Ivor (2000). *The Search for Mathematical Roots, 1870-1940: Logics, Set Theories and the Foundations of Mathematics from Cantor through Russell to Gödel*. Princeton: Princeton University Press.

[3] Landini, Gregory (1998). *Russell's Hidden Substitutional Theory.* Oxford: Oxford University Press.

[4] Landini, Gregory (2011). *Russell*. New York: Routledge.

[5] Marion, Matthieu (2011). *Wittgenstein on surveyability of proofs*. In Marie McGinn & Oskari Kuusela (eds.), The Oxford Handbook of Wittgenstein. Oxford: Oxford University Press.

[6] Monk, Ray (1999). *Russell*. New York: Routledge.

[7] Russell, Bertrand & Whitehead, Alfred North (1927). *Principia Mathematica* (Second Edition) 3 Vols. Cambridge: Cambridge University Press.

Russell and *Succession*

BY TIM MADIGAN

I published an article entitled "Russell in Popular Culture" in the book *Bertrand Russell, Public Intellectual* (Spokesman Books, 2022), co-edited by Peter Stone and me, and I continue to try to keep up with references to the Good Lord in literature, movies, television shows, comic books, cartoons, and other such venues. I was therefore delighted to see that he was referenced not once but twice in Season One, Episode 5 of the popular TV series *Succession*. The character Ewan Roy, played by actor James Cromwell, is appalled to learn that his grandson Greg, played by actor Nicholas Braun, has joined the media empire run by Ewan's estranged brother, the Rupert Murdoch-like Roy. When Greg tells his grandfather that he is "working hard" at his new job Ewan replies: "'One of the symptoms of an approaching nervous breakdown is the belief that one's work is ever so important.' That's Bertrand Russell." Greg is oblivious to the advice, and then suggests to Ewan that he consider giving up his seat on the media company's board (thereby doing Roy's bidding, as he wants to completely control the board). His grandfather tells him: "'Life is nothing but a competition to be the criminal rather than the victim.' Also Bertrand Russell." Greg, not getting the hint, says "I don't have a Bertrand Russell quote because I haven't even heard of him until now." One suspects—as future episodes confirm—that he has not been enlightened by the words of wisdom bestowed upon him by his concerned grandfather. (See the results of searching "succession bertrand russell" in Google.)

Given that quite often such quotations are spurious or attributed to the wrong person I'm glad to say that, by using the expertise of his Bertrand Russell Facebook Group members, Peter was able to verify their near-accuracy. The first one is from *The Conquest of Happiness*, Chapter Five, though slightly paraphrased. The second one is from a letter to Ottoline Morell (See "Life Is Nothing But a Competition To Be the Criminal Rather Than the Victim" on *Quote Investigator*).

Even more noteworthy is the fact that Ewan Roy is expertly played by Cromwell, a respected actor and a well-known social activist (see "Actor and activist James Cromwell" on *YouTube*). Given Cromwell's commitment to social justice, I think that he and Lord Russell would have gotten along very well and, unlike Greg and Ewan, would have had much to talk about.

The June 2024 Annual Meeting at the Center for Inquiry!

BY LANDON D. C. ELKIND

1 Our 50th annual meeting

The Bertrand Russell Society 2024 and 50th Annual Meeting will be held in-person on June 7-9 at the Center for Inquiry in Amherst, New York (adjacent to Buffalo, which has the closest airport). We are planning a hybrid conference, with some presentations in person on campus and others via Zoom. In-person presentations will get priority, should space restrictions become unmanageable.

2 Conference Venue and Accommodations

All conference talks will take place at the Center for Inquiry, whose founder Paul Kurtz in 1988 received the Bertrand Russell Society Award. The Center for Inquiry is adjacent to the University at Buffalo's North Campus. Accommodations should be made independently–there are plenty of hotels near the conference venue.

3 Theme: 50th Birthday of the BRS

The Bertrand Russell Society, incorporated in 1974, will celebrate its 50th anniversary this year. Accordingly, papers about the Russell Society, in addition to papers about Russell's personal life and his thought, work, and legacy, are most welcome.

4 Call for Abstracts

Abstracts for the Bertrand Russell Society's 2024 annual meeting should be submitted here: https://bertrandrussellsociety.org/submissions/. The deadline is April 2nd, 2024. Presenters are allotted 30 minutes, with 20 minutes being for presentation and 10 minutes for discussion.

5 Student Paper Prize

Each year, the Bertrand Russell Society accepts submissions for its Student Paper Prize, which is awarded annually to the best new paper in Russell studies. Papers may be submitted by graduate or undergraduate students. They should deal with some aspect of Russell's life, work, or influence, and be of suitable length for presentation at the annual meeting. The award includes a $200 cash prize, a complimentary first-year membership in the Society, and free registration and lodging at the Society's annual meeting, where the prize is presented. The Society does not award a Student Paper Prize every year, but only in years where there is a sufficiently meritorious paper.

Student Paper Prize submissions should be emailed with (1) an anonymized paper and (2) a cover page including the paper's title and abstract, author's name, email address, and institutional affiliation. Submissions should be emailed to Adam Stromme (chair of the committee) at brssoc-secretary@gmail.com. Submissions for the 2024 Student Paper Prize are due Sunday, March 31st, 2024.

6 Membership requirement for presenters

Please also note that you must be a member of the Bertrand Russell Society to present at the annual meeting. This applies to online and in-person speakers. Attendees who are not giving a talk can still attend without being a BRS member. You can check your membership status here: https://russell.humanities.mcmaster.ca/brsmembers.htm.

You may join (or renew membership in) the BRS, and see the many benefits of membership, at this link: https://bertrandrussellsociety.org/join/.

7 Travel information

Travel information is available from the University at Buffalo.

8 Questions?

You may contact us at https://bertrandrussellsociety.org/contact/.

Russell Quote of the Issue

by Bertrand Russell

> Men of learning, who should be accustomed to the pursuit of truth in their daily work, might have attempted, at this time, to make themselves the mouthpiece of truth, to see what was false on their own side, what was valid on the side of their enemies. [...] The guardians of the temple of Truth have betrayed it to iolaters, and have been the first to promote the idolatrous worship.

"Justice in War-Time"
Quoted from pages 2-3 of *Justice in War-Time*, Open Court Publishing Co., Chicago, 1916.

Have an idea for contributing to the Bulletin, whether by you or someone else? Write to the editor! See the footer for a link to contact us.