Fan Letter to J. K. Rowling

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1 On Musings and Interpretation

1.1 Introduction

We are both quite devoted fans of the Harry Potter books. Since they captured our interests a few years ago, we have re-read them many times and delight in the numerous debates and conversations they have sparked. Harry’s world is so richly textured we have fallen into it. His world is, at times, paradoxically teeming with detail and tantalizingly spartan. With so many clues and hints of unseen wonders, we have spent much time extrapolating on the inexplicit details of the magical world. In this pursuit, we have tried to be as steadfast to the books as possible, venturing outside to parallels in the Muggle world only when we see no other course of action. We have discovered much, but much confusion remains. It is in the quest of knowledge and understanding that we humbly ask you to consider our questions and, if possible, shed light into the dark, Boggart-filled corners of our confusion.

1.2 Students Attending Hogwarts

We feel there is a discrepancy between the number of students you mention attend Hogwarts (1000) [1]. and the number implied by certain details in your books. The most consistent number we find is a little under 300 with about 40 students per year. If 1000 students are taken as fact, then about 140 students per year is in fact the case. We now will provide examples in hopes to illuminating why we feel our number is implicit in your books.

In many classes, Gryffindors learn along side other houses (Herbology, Potions, flying, Care for Magical Creatures). In several cases, 20 sets of equipment are mentioned in the the descriptions of arrivals to these classes (20 brooms, 20 cauldrons, 20 earmuffs) [2, 3, 4]. Assuming that there are roughly the same number of students in each house, these numbers imply 10 students per house (20/2=10). Given the four houses, this gives 40=4x10 students per year. With seven years in all, we obtain 280=7x40 students attending Hogwarts.

Lupin’s class also lends credence to the theory of 10 Gryffindors. When facing the Boggart, eight people step forward to face it [3]. Harry and Hermione do not face it, making 10 people in their year. We have already cited significant
evidence supporting the fact that there are 10 students per year per house. This
indicates that there are 10 Gryffindors in Harry’s year. We know eight of them
(Harry, Ron, Neville, Seamus, Dean, Hermione, Lavender and Parvati), but it
appears that there are two missing. We know those two must be female since
there are only five beds in the boy’s dormitory. This leads to the conclusion
that there are two female Gryffindors in Harry’s class who we haven’t met yet.

From the previous evidence, we must conclude that there are 10 Slytherin
and 10 Hufflepuff in Harry’s year. While Ravenclaw remains unknown, it is
reasonable to assume that they have an equal number. We remain with 280
students.

Given reasonable sizes of rooms, other descriptions support 10 students per
year per house. Textual evidence supports this number over the 33 students per
year per house necessary from 1000 students at Hogwarts.

In Philosopher’s Stone, McGonagall leads the students up to the front of
the Great Hall to be sorted. They form a single line at the head of the hall in
front of all the houses [2]. 140 students in a line makes for a hall much greater
than one filled by just four narrow tables. It seems much more reasonable to
assume 40 students per year. In Chamber of Secrets, McGonagall speaks to all
the Gryffindors in their common room (which is mentioned as packed) [3]. The
common room (with tables and chairs) seems more likely to support 70 students
opposed to 250. Also, the houses line up in Goblet of Fire and McGonagall
addresses her house. It seems impractical to address a line of 250 whereas it
would be easy to do so for a line of but 70. Again, we see support for a student
body with around 300 students.

The Yule Ball also provides information about the number of students. The
Great Hall contains 100 circular tables, each with 12 chairs [5]. Assuming that
the hall has not been enlarged or shrunken magically, it is the same size that
holds the 4 house tables for meals. Let the circular table be inscribed in a square
with a gap g being the smallest distance between the table and the edge of the
square. Divide the table into 12 wedges, each with a radial angle of $\theta$. The edge
of the table associated with this wedge is given length s. So, the radius of the
table is related to the edge by:

$$r = \frac{s}{\theta}$$

In this case, $\theta=\frac{2\pi}{12}=\frac{\pi}{6}$. The area of the square is just $\text{length}^2$. So,

$$A_{\text{table}} = (2r + 2g)^2 = 4(r + g)^2$$

There are 100 tables, but we can’t assume that the tables cover the entire floor,
just a fraction $\alpha$ of them. So,

$$A_{\text{tables}} = 100 A_{\text{table}}$$

$$A_{\text{tables}} = \alpha A_{\text{total}}$$

Thus, $A_{\text{total}} = A_{\text{tables}}/\alpha$. Normally, the Great Hall is filled with 4 long tables
(assume that the staff table remains in both scenarios). The tables fill an area
\[ A', \text{ where } A' = \alpha' A_{\text{total}}. \] The tables have length \( l \) and width \( w \). On each side of the table is a gap of width \( g' \). Students are given \( s' \) amount of space at the table. So, \( l = ns' \). The total number of students at Hogwarts, \( N \), is thus \( N = 8n \).

\[ A_{\text{total}} = \frac{1}{\alpha'} A' \]

\[ A' = l(2g' + w) \]

\[ A_{\text{total}} = \frac{Ns'}{8\alpha'} \]

\((2g'+w)\) Since the total area, \( A_{\text{total}} \) has not changed, the quantities derived must be equivalent. Thus,

\[ N = \frac{3200 \alpha' \left( \frac{6s}{\pi} + g \right)^2}{s' \alpha \left( 2g' + w \right)} \]

Suitable values for these parameters may now be found. The four tables that usually sit in the Great Hall take up most of the room. So, \( \alpha' \) should be close to 1. To allow for dancing, \( \alpha \) should be under .75. When eating, it is reasonable to assume at least 3-4 feet of space, so \( s' \) should be in this range. Sitting at the dance, one might take up a similar amount of space, so \( s \) should be on the order of \( s' \). To allow for movement between tables at the dance, \( g \) should be 5-10ft. To account for benches and morning bustle, \( g' \) can be taken to be even larger than \( g \), but not too much larger. The tables should be wide enough to accommodate the plates of food during feasts (admittedly a lot of food), but narrow enough such that it does not inhibit conversation with housemates. It is reasonable, then, to assume \( w \) no larger than 10ft. A check of these parameters gives Hogwarts a population in the many thousands of students, which does not seem reasonable, nor does it fit with any other corroborations from the texts or interviews.

It is also interesting to note that there is seating at the Yule Ball for 1200. Only 4th years and above are allowed to attend (with a few exceptional 3rd years like Ginny) [5]. So, only 4/7 of the Hogwarts student body is allowed at the Ball. There are 24 foreign students (12 from each school). If there are but 1000 students at Hogwarts, only 560 are in attendance giving no more than 600 at the ball. This means that the tables are half full. This seems like poor planning on the part of the staff. It seems that you are closest with members of your own house, specifically your year. As such, you would most likely sit with 9 other people (your date, your dormmates, and their dates). This makes for full tables and not the sparsely populated half-full tables seen at the Ball, even using the (to us) absurdly high number of 1000 Hogwarts students.

### 1.3 Schools in Wizarding Britain

Apart from the number of students attending Hogwarts, the existence of wizarding schools in Britain outside of Hogwarts also has conflicting information.
concerning it. In an interview, you stated that a magic quill records the birth of all magical children in Britain in a book that McGonagall then checks every year before sending out letters [6]. This seems to indicate that Hogwarts is the only wizarding school in Britain. Yet, passages from the books and logic dictate more than one school should all magical children obtain education (though not all as good a one as obtained at Hogwarts).

Neville states that his family thought he was a squib for a while and were even more surprised/pleased that he had enough magic in him to attend Hogwarts [2]. This seems to indicate that those of lesser magical ability go to other schools.

In Quidditch Through the Ages, 13 teams in the League are mentioned [7]. For such teams to exist, they must have a fan base to allow them to be at all profitable. Assuming that Hogwarts has a stadium of capacity 1000 (if there are really 1000 students, then they all have to have seating), we can conservatively state that professional Quidditch stadiums have at least this capacity. Considering that not all fans can attend all matches and that teams would like to fill their stadiums with as many of their fans as possible, it seems plausible to assume that each team has 1000 fans in Britain. A further over-simplification is to assume that all fans of a team are married to other fans of the team, giving 500 couples. Now, assume each couple has one school age child. This is an over-estimation, but is balanced by the gross under-estimations made until this point. As such, there are 500x13=6500 children of school age or under (1-17) in Britain. So, there are about 380 (6500/17) students per year. Even if Hogwarts has the high number of 1000 students (140 per year), 240 students are left in the cold. If other schools are Hogwarts size, then there are at least two other schools in Britain to accommodate these children.

A possible flaw in this logic is that if Hogwarts really only has around 300 students, then the size of stadia must be reduced. At this point, we recall that in the final match against Slytherin in year 3, Slytherin has 200 fans (with Snape up front) [3]. 3/4 of the crowd is wearing Gryffindor colors, giving 800 fans in all. By a similar calculation to that above, there are 400 couples. 13x400=5200. This gives 305 students per year. Going with the high value of 140 students per year, there is at least one other school (albeit a little larger than Hogwarts with 165 students a year).

1.4 Restrictions of Use of Magic

To the chagrin of all Hagrid fans, he is not allowed to do magic except in special circumstances [2]. While this makes sense at first, by the third book, he should be allowed to do magic given other evidence.

When Hagrid is expelled, his wand is broken and he is, presumably, forbidden to do magic again, though permitted to live in the magical world. This makes a lot of sense and is similar to the revocation of voting rights to convicted felons. It seems, however, that Dumbledore knows that Hagrid did not open the chamber and attack the students. We feel it reasonable that most people would believe that Voldemort opened the Chamber of Secrets while a student. Perhaps it is not widely known that he was Tom Riddle, but who wouldn’t believe that
Voldemort is the Heir of Slytherin and sent a horrible monster attacking Muggle-borns? Also, while Hagrid was imprisoned, Ginny was attacked. Hagrid is not guilty and it is mentioned that he has been cleared of all charges [4].

The only reason he should not be allowed to do magic is that he hasn’t been trained in doing. We find, however, much evidence pointing to the conclusion that this should not stop Hagrid in his pursuit of magic. Filch is a squib, yet he is trying to learn magic from Kwikspell [4]. Also, the Fred and George leave Hogwarts without finishing it to start their own school. They are also allowed to do magic outside of school when they become of age (18), despite still being in school [8]. Hagrid is clearly of age, being at least 64 years old (he was 13 when the chamber of secrets was opened 50 years in the past of Harry’s second year) as of Harry’s fourth year and has a (now) clean record. Some might argue that the Ministry did not take Dumbledore favorably and, as such, might not approve Hagrid for magic use. Yet, Hagrid is cleared when Dumbledore is still in the Ministry’s good graces. When he is cleared, it is also not known that he is half-giant. We see no evidence that Hagrid should not be allowed to do magic after the end of Harry’s second year.

Another puzzle concerning Hagrid is his umbrella, containing the halves of his wand. Hagrid can clearly do some basic magic (starting fires [2], speeding a boat [2], engorging pumpkins [3]), without difficulty. He fails at transfiguring Dudley into a pig, but human transfiguration is 6th year magic and he never got that far [5]. Ron, on the other hand, can’t even do basic magic with his partially broken wand without disastrous results [4]. Why does Hagrid’s fully broken wand perform better than Ron’s partially broken one?

References


