

# C, You, and Farewell



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Over the past 6 years, I have enjoyed being the Editor of *ES&T Letters* and launching the journal, but I have especially enjoyed writing occasional editorials that each focused on a specific topic. This will be my final editorial for the journal, so I will have to fill this one with a few different topics. My last editorial of 2019 introduced the topic of the daily energy unit D, which was defined as the amount of energy in the food we eat every day (2000 Cal = 1 D). The advantage of this unit is that it does not change much among different people, so everyone should be able to relate to this energy unit based on the food we all eat every day. Other forms of energy that we use for other activities can then be related to this D unit. For example, a 100 W light bulb consumes about 1 D per day, a gallon of gas used every day is 14.7 D, and your refrigerator (if new) consumes ~0.6 D.

While the D concept addresses the energy supply and consumption aspects of our lives, I felt something was missing to tie this unit to climate change and specifically to CO<sub>2</sub> emissions. Therefore, I would like to add the concept of 1 C, which is defined as the amount of CO<sub>2</sub> each person exhales daily (~2 lb per day, but I am still working on this). We cannot appreciably reduce our food consumption below ~1 D or our own carbon emissions to less than ~1 C. Energy we consume in addition to food greatly increases both our D consumption and C emissions. For example, if we use 1 gallon of gasoline (14.7 D) we emit ~10 C. Thus, we have a relationship of ~1.5 D = 1 C for gasoline. For jet fuel, this increases to 1.7 D for every 1 C, while for natural gas, which has the lowest carbon emissions based on energy content, we have nearly 2.1 D per 1 C. Using these units, we can relate any activity that uses energy from fossil fuels to carbon emissions. For example, if it takes 16 D to put 1 D of food on my table, then the range for my carbon emissions is ~8–11 C (depending on the fuel source). If I fly from State College to Washington, DC (my ticket indicates 137 lb of CO<sub>2</sub> for the flight), then I just added 69 C to my day.

The second part of this editorial is You, because I would like to thank those of you that have read my editorials these past six years. Each year, one of these editorials was dedicated to reviewer awards that we used to say a big “thank you” to our very best reviewers, and another editorial was used to thank those people who submitted really outstanding research results by giving them a best paper award. The other editorials were on a variety of topics that, even before I wrote them, often consumed my time over several months (or even years), while others were written almost completely spontaneously. As I look back over the topics of these editorials, I find I had my “editor” type editorials, like “I owe, I owe, so off to review I go”

which was written to remind authors that they should repay a journal for reviews they received by providing reviews of other manuscripts. Another editorial within this area was on the author impact factor (AIF), suggesting to authors that the impact of their own work might be more important than the impact factor of the journal (JIF). A few editorials I wrote were in the style of “future editorials”, as I dated the editorial some years into the future. One of my favorites using this style was “The Death of the Proposal”, which described a future time when the National Science and Engineering Foundation decided to pay researchers for innovative work they published that year, rather than the work they proposed to do for a project. The advantage of that process was that they always knew that taxpayer dollars were spent wisely, with the universities assuming the cost of the work that did not quite measure up (or work out). Is not that happening a bit already?

There were a few editorials that helped to guide my thinking on new directions in my work. For example, the “food versus light bulbs” editorial was the beginning of the concept of D; several years later that had evolved to the point where I proposed the unit D, and now this editorial has introduced the concept of C. There is no greater challenge to humanity than climate change, and I believe that reducing carbon emissions will require everyone on the planet being able to understand their energy consumption in units that make sense, and also to understand how such consumption impacts carbon dioxide and other greenhouse gas emissions. We need to work hard to educate our own students, and the public, about energy consumption and carbon emissions in terms that are easy to comprehend. I believe the approach of “energy literacy based on units of C and D” can help to accomplish this! If you agree, please join me in using these units in your classes and presentations. Maybe for your next NSF proposal you can include outreach based on this D and C concept. If so, let me know if I can help with that work.

The final part of this editorial is to say farewell! I was honored to be given the chance to launch *ES&T Letters* as a rapid publication format, and I have very much enjoyed being the Editor these past 6 years. Our short word limit (compared to *ES&T*) of ~3000 words (we allowed some flexibility in this limit) and the dedication of the associate editors (Bill Arnold and Staci Simonich from the start, and more recently Daniel

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Schlenk) enabled a submission to publication timeline of ~1 month. We published around 10–12 articles per month, making it easy for readers to quickly scan our Table of Contents for the highly impactful articles most relevant to their own interests or work. The journal has achieved an excellent impact factor in this field, but more importantly, papers published in *ES&T Letters* have connected well with the environmental community. In 2019, for example, we saw a 20% increase in downloads compared to the previous year.

Thank you all for reading the journal articles (and my editorials) and for reviewing manuscripts. I hope that you will continue to support the journal and submit your best work in *ES&T Letters*. I wish you success in your work, and I bid you a fond adieu and farewell!

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## Notes

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