Why you should (happily) review papers:

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1. You learn a lot useful things about writing, science (or whatever), and publishing. You may even learn more about the technical aspects of manuscript writing, organizing, and publishing from a bad manuscript than from a good one, so don't assume that you've wasted your time just because the manuscript your reviewed was a travesty.

2. You will learn what is appropriate (or at least typical) in terms of length, level of detail, and subject matter for particular journals. You should get an idea about these things by reading published papers, but reviewing can help make all this more clear. For example, a common criticism of manuscripts submitted by recent PhD students is that a manuscript "reads too much like a thesis chapter". This isn't an issue if you write your thesis chapters as manuscripts, but in some cases the thesis contains much more detail than a manuscript should. Even though doctoral students surely read many published articles and should get some idea of what is an acceptable level of background material, somehow it is different when you are writing your own manuscript. If you start looking at manuscripts (even your own) through the eyes of a reviewer, you get better calibrated, saving yourself some criticism when you submit your own manuscripts.

Furthermore, some journals provide a checklist or series of questions for reviewers to fill out as part of the review. As an editor I find these lists rather useless, but they do provide some structure and continuity to a review. For the reviewer, these may give an idea for what kinds of things are considered important, in general or for a particular journal. You may also learn about this kind of thing from other means during the review process, and these may help you organize and target your own manuscripts better.

3. Once you have some experience reviewing, you can better deal with reviews of your own manuscripts, especially if there are (very) negative comments. If you are encouraged to resubmit a manuscript, you may have a better idea for how to craft the letter to the editor, explaining any reviewer comments you decided to ignore. If the editor knows you as a diligent and thoughtful reviewer, this opinion might help you in discussions with that editor about the fate of your own manuscripts.

4. If you are a reliable and thoughtful reviewer, editors may return the favor by trying to make the manuscript review process as efficient as possible for you. If you submit a lousy manuscript, the editors are unlikely to give you a break just because you are a good reviewer, but a grateful editor might feel inclined to handle your manuscript soon after the reviews come in rather than letting it languish in their inbox for a while.

5. In some fields, for some journals, editors are influential people and it can be a good thing to come to their attention as a bright and thoughtful person. This can be helpful not just with your own manuscript submissions, but just in general in terms of your visibility and professional standing in your field.

Note, however, that not everyone shares this view that editors can be important people in their fields. A few years ago, I was in a committee meeting during which one of my fellow committee members, an outspoken professor with strong opinions, tried to sink the nomination of a particular candidate for an award by noting that the candidate was an editor of a journal and this meant that the candidate was a "has-been" whose research career was so washed up that he was now an editor instead of a real researcher. He announced that most editors are "losers". There was silence in the room, so he said "I'm guessing that there are a lot of editors in this room and that you all now hate me." I said "I don't know about the others, but I'm an editor and I hate you." (In fact, I didn't hate him at all, but it felt good to say it.)

6. And finally, reviewing is considered Professional Service, a component of a faculty job at many institutions. You can list on your CV or faculty activity report or tenure dossier the journals for which you have done reviews. If editors are requesting reviews from you, this is a sign of professional visibility, and in many fields that is a good thing.

As I've written before, if you submit manuscripts, you should review manuscripts. If you review manuscripts, you should do a careful and constructive job, finding a good balance between sharing your expertise and not sharing any irritation or biases that are not appropriate to display in a review. If you are angry at an author because they gave you a bad review or you hate their former adviser or whatever, don't do the review.

I hope this is a semi-convincing list of the various reasons why reviewing can be useful for the reviewer beyond the content of the manuscript. These reasons will be cold comfort when you are deep into a ghastly manuscript, but realize that somewhere, somehow, someday, it is better to be a constructive and thorough reviewer than a mean and/or lazy reviewer.