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Comment on hgss-2022-7

Tony Rice (Referee)

Referee comment on "HMS *Challenger* and SMS *Gazelle* – their 19th century voyages compared" by W. John Gould, Hist. Geo Space. Sci. Discuss.,
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Challenger/Gazelle review

- In the mid 1880s two very similar European naval vessels undertook multi-year circumnavigations with a main objective of making what we would now call oceanographic observations. One of them, the British HMS *Challenger*, is still remembered and celebrated throughout the oceanographic community as making a very significant contribution to the development of ocean science. In contrast, the German SMS *Gazelle* is almost forgotten even in its native Germany. As we approach the 150th anniversary of both cruises, John Gould attempts to explain why the two ventures have left such different records and, at the same time, tries to bring the *Gazelle* results to the notice of a larger audience than has hitherto been the case. In my opinion he succeeds in both objectives and also puts the two cruises into a late nineteenth century political context which, to my knowledge, has not been done so explicitly before. Therefore, with the exception of some relatively minor, mostly typo changes (see section 3 below), I strongly recommend publication.
- Another reviewer has made some very valid points about possible additions to the current ms, particularly with regard to more information about how the sailing instructions were developed, why the Challenger took so many sub-surface temperature measurements and further details of the number and distribution of the various samples and data collected by the two voyages. I disagree; in my opinion the paper is already long enough, with quite a lot of biographical information that has already been published elsewhere. Despite this, I support its inclusion because it will make much more interesting and informative reading for someone with limited pre-knowledge of early oceanography. However, I feel the addition of further details such as those mentioned above would be superfluous for the following reasons. First, the background to the Challenger voyage was extensively covered in Wyville Thomson's introduction to the reports and widely quoted subsequently (and are available on line, of course). In the case of the *Gazelle*'s instructions I feel that the author has made a decent fist of explaining where the orders came from on the basis of what seems to be relatively sparse documentation. Second, subsurface temperature measurements,

albeit relatively few and often not very reliable, had been taken by many exploration cruises certainly since the early 1800s so any major new cruise would certainly have been expected to continue the practice. Furthermore, however, they became particularly desirable after the discovery of widely varying near-bottom temperatures during the Lightning cruise of 1868 and the subsequent Porcupine cruises, and the bearing they had on the growing controversy about the causes of deep sea circulation, well publicised by Thomson in *The Depths of the Sea* published as the *Challenger* sailed. Finally, while a little more detail of the *Gazelle* data gathering regime might be useful, to do the same for the *Challenger* would be a huge undertaking, would add very significantly to the paper's length and, in any case, is available elsewhere.

- The following is a list of minor, mostly typographical, changes I suggest.

85 *The origin of species* (not origin of the species)

474 "Holderness, a position..."

560 compare spelling line 507

677 "...isopods and other crustaceans..."

956 "...in the ocean. The leading innovator...."

972 ".....other experimental devices. One, designed by Siemens..."

- "Arguably, had the Challenger...."
- "Thus, the major focus...."
- "...were not safe..."
- "...seawater, thus freeing..."
- "...called on..." not "called in"
- Should have a note here that, after the material had been studied and reported on, most of the marine material was deposited at the Natural History Museum in London, where it still is.

Tony Rice

Alton, Hants, July, 2022