

Atmos. Chem. Phys. Discuss., community comment CC8
<https://doi.org/10.5194/acp-2020-1266-CC8>, 2021
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Comment on acp-2020-1266

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Community comment on "Opinion: Papers that shaped tropospheric chemistry" by Paul S. Monks et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-1266-CC8>, 2021

Dear Paul, Ravi et al.,

Thank you for the considerable effort in putting this history together – to one active in the field since the late 1970s (when the curve in Fig 1 kicks off), it is an enjoyable read, and a trip down memory lane.

Inevitably, having solicited them, you will get lots of suggestions for things that you have left out or rated less important than judged by others. Already there are several... So I will add mine, for your consideration. Two areas in my view deserve their own explicit subsection of section 2. Some aspects are already mentioned in passing in several places, but my judgement would be that they deserved their own explicit subsection.

- Measurement techniques. We might divide up the whole topic into two sub topics – the chemistry itself, and the methods used to probe it. Many advances in our understanding of atmospheric chemistry have come from stepwise advances in measurement (and modelling) capabilities. There are already explicit sections for kinetics, models, meteorology and transport and satellite measurements, but nothing explicitly for chemical measurement techniques. The success of the high impact journal AMT speaks for the importance. Examples of discoveries that might be included in this area might be (but are not limited to):
 - The ECD detector (Lovelock), which enabled the detection of halocarbons
 - PTR-MS – already mentioned in 2.12 in the VOC context
 - OH measurements – LIF etc.
 - The chemiluminescence technique for NO and NO_x
 - Dobson method for O₃ (admittedly stratospheric)
 - Satellite retrievals – satellite global mapping of composition has been a real revolution.

- Greenhouse and climate-relevant gases (and aerosols). Given the current state and importance of climate change science and policy, a separate section on greenhouse and other climate-relevant species seems to me to be very desirable. There are some mentions throughout, eg to Keeling and to long term monitoring networks like ALE/AGAGE. GAW, NOAA, ICOS, but it would be valuable to bring them together into

their own section. Also the techniques that enable reliable and accurate long term records to be maintained – NDIR, optical in situ and remote sensing techniques, isotopic methods, and satellite measurements (again).