The significance of small things

WHAT WE KNOW ABOUT CLIMATE CHANGE

by Kerry Emanuel

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The world may be largely indifferent the presence of man, yet we have magnified our influence to global scales — above all, through the recent increase in atmospheric greenhouse gases.

As a general rule, scientists should not be asked to review other scientists' attempts at popularization. We tend to focus on details or on minor points of emphasis that are close to our specialties, but completely miss the central point — whether the communication leaves its consumers better informed or more appreciative of the science than before.

Since scientist-reviewers are presumably quite well informed, they are singularly poorly placed to judge the impact of popular science on the lay public. This also explains why most popularization efforts from scientists (my own included) fall flat, and, perhaps, why Al Gore's *An Inconvenient Truth* got more people to sit through a 90-minute presentation on climate than the efforts of all of the world's climate scientists combined.

Despite this, scientists are regularly asked for such services, and in truth we are happy to oblige. Sometimes we find great distortions of the science that need to be contradicted, but most often we find genuine attempts to inform and educate. Some are well written, and some not; some well fact-checked, some not. We usually come to the conclusion that the latest offering would help improve the public's understanding of the problem if they could only be brought to read it.

Kerry Emanuel's *What We Know About Climate Change*, a short introduction to global warming by a well known climate scientist, is an easy read and covers the basics well. More interesting from my point of view are the personal touches: a brief, if not fully worked through, discussion of environmental philosophies and how they shape views on climate change; an account of Emanuel's initial scepticism; and, of course, his personal contributions to the science.

Emanuel starts by contrasting a classical view of the universe as regular and unchanging with a more capricious universe that is plagued by a vengeful god punishing humanity for its sins. He is undoubtedly correct that these ideas influence reactions to the issue of climate change. The notion that the universe is indifferent to humanity underlies many people's initial scepticism that human actions could affect the climate at all. The contrasting idea that our sinful actions will cause a calamity to befall us has a long history and finds echoes in elements of the environmental movement.

What Emanuel does not explicitly discuss, though it could be seen as implicit in his text, is that it is science that allows us to break out of these medieval worldviews and come closer to seeing the universe as it really is. It turns out that the world is indeed mostly indifferent to our presence, but there are a few key pressure points that have allowed us to inadvertently magnify our influence to global scales. The increasing concentration of certain trace greenhouse gases in the atmosphere is chief among them.

This philosophical discussion may have resonance in the rather public controversy concerning the impact of climate change on hurricanes, a field in which Emanuel is a key player, though he has sensibly remained aloof from acrimonious debates. It is difficult to convince people who spend all day looking at the devastating dynamics of individual storms that those dynamics could be affected by anything as puny as a few parts per million of carbon dioxide. But the lesson here is that small things can have a big influence given a long enough time.

Emanuel has a useful back story for this book. He recalls being rather wary of Jim Hansen's testimony to the US Congress in 1988, in which Hansen famously declared that he was "99 percent certain" that a human-induced global warming signal was evident is his data. But with the ongoing accumulation of a vast array of evidence, Emanuel, like many others, has been persuaded that anthropogenic warming is real.

The afterword essay by environmental policy experts Judith Layzer and William Moomaw on actions in the US to reduce climate change is a useful counterpoint to the science presented by Emanuel. It is certainly better than the exhortation to buy compact fluorescent light bulbs (sensible though that is!) that so often follows climate change discussions these days. The essay may be a little optimistic, however, in anticipating that the US could easily reduce emissions by three percent per year, year after year, simply by increasing efficiency and reducing energy use.

Throughout the book, the villains of the disinformation industry get a rightful lambasting. Now that climate change has finally forced its way onto the agenda of the US Congress, there is less need to use *les refusards*, as Emanuel evocatively describes them, as political cover for inaction. Unfortunately, just as there are still a few people who deny the reality of ozone depletion, we will be stuck with the climate change contrarians for many years to come. As they become increasingly irrelevant, we can expect them to become increasingly shrill.

Emanuel's book does not really live up to its title. We know much more about climate change than can be squeezed into a short review text. But as our friends and colleagues are all too painfully aware, 'tell us all you know' is another request one should never make of a scientist.

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