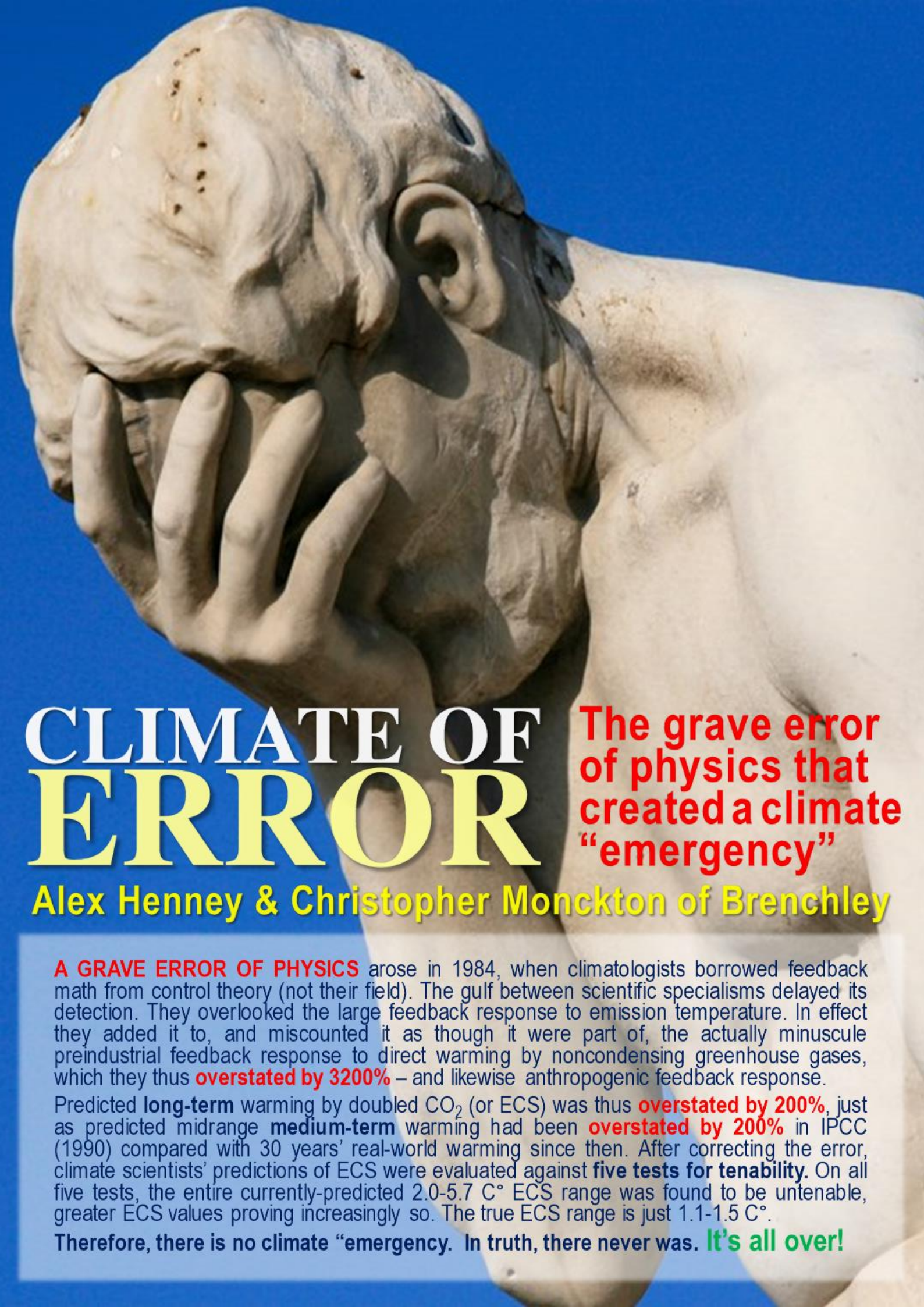

CLIMATE OF ERROR

The grave error of physics that created a climate "emergency"

Alex Henney & Christopher Monckton of Brenchley

A GRAVE ERROR OF PHYSICS arose in 1984, when climatologists borrowed feedback math from control theory (not their field). The gulf between scientific specialisms delayed its detection. They overlooked the large feedback response to emission temperature. In effect they added it to, and miscounted it as though it were part of, the actually minuscule preindustrial feedback response to direct warming by noncondensing greenhouse gases, which they thus **overstated by 3200%** – and likewise anthropogenic feedback response.

Predicted **long-term** warming by doubled CO_2 (or ECS) was thus **overstated by 200%**, just as predicted midrange **medium-term** warming had been **overstated by 200%** in IPCC (1990) compared with 30 years' real-world warming since then. After correcting the error, climate scientists' predictions of ECS were evaluated against **five tests for tenability.** On all five tests, the entire currently-predicted 2.0-5.7 C° ECS range was found to be untenable, greater ECS values proving increasingly so. The true ECS range is just 1.1-1.5 C°.

Therefore, there is no climate "emergency. In truth, there never was. It's all over!

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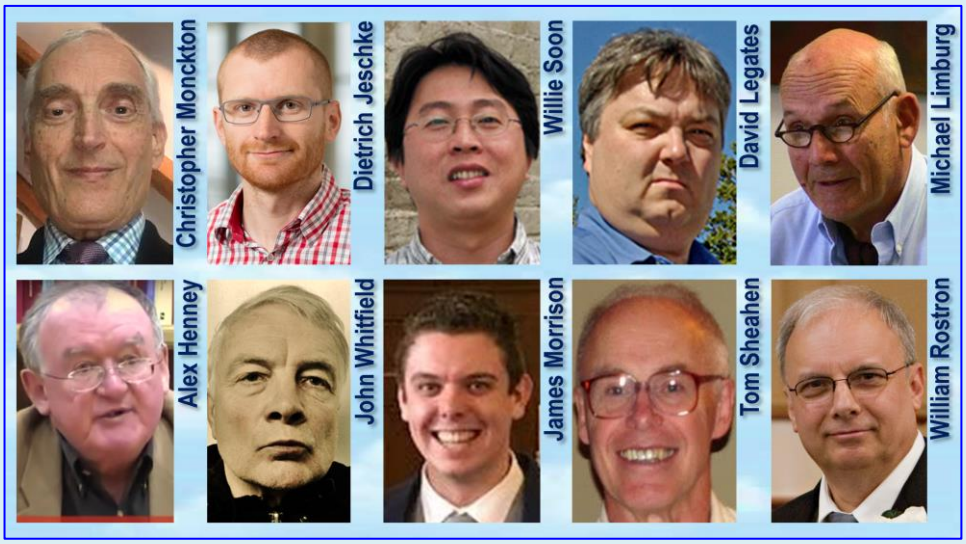
Meet the Argonauts



This brief is a **plain man's guide** to a learned paper in climatological physics by **The Argonauts,** a self-funded global team of eminent climatologists and control theorists, who have spent years studying climate sensitivity – how much (or how little) global warming we may cause.

The Argonauts discovered a grave error of physics that led climate scientists to predict three times too much global warming.

Alex Henney (alexhenney@aol.com) advises governments worldwide on the global electricity market and grid development. He conceived the idea for this plain man's guide and wrote the first draft.

Christopher Monckton of Brenchley (monckton@mail.com) is a former adviser to Margaret Thatcher on science and policy at 10 Downing Street. He discovered climate scientists' error and gathered the Argonauts to investigate it.

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Dipl.-Ing. Michael Limburg is a control engineer and climate specialist at the Europäisches Institut für Klima und Energie.

John Whitfield is a control engineer. He designed and built the test apparatus on which this research was verified. His work was later confirmed by a similar test apparatus at a government physical laboratory.

James Morrison is an environmental consultant who once sold wind turbines to Napa Valley wineries.

Dr Tom Sheahen is a physicist and alumnus of the Massachusetts Institute of Technology.

William Rostron is an award-winning control engineer who designed and programmed the world-leading integrated control system at the Oconee Nuclear Facility, Seneca, South Carolina.

Acknowledgements

The Argonauts thank Mr William Bailey, Professor Matt Briggs, Mr Edward Bullerdieck, the late Professor Freeman Dyson, Professor Chris Essex, Professor Pat Frank, Professor Dr Hermann Harde, Mr Michael Haseler, President Václav Klaus, Professor Dr Mojib Latif, Mr Nic Lewis, Professor Adrian Mathias, The Viscountess Monckton of Brenchley, Dr Benoît Rittaud, Academician Dr Vladimir Semenov, Professor Nir Shaviv, Dr Roger Taguchi, Mr George White and Academician Dr Nina Zaytseva for discussions, Professor Ray Bates, The Baron Clanmorris of Newbrook, Dr Michael Connolly, Dr Ronan Connolly, Professor Will Happer, Dr David Heald, Frau Professor Dr Liselotte Kornstädt, Professor Murry Salby and the Global Warming Policy Foundation for pre-submission reviews; Professor Maria da Assunção Ferreira Pedrosa de Araújo, The Rev. David Foster, Mr G. Edward Griffin, Ms Pamela Matlack-Klein, the late Professor Nils-Axel Mörner, Mr Hal Shurtleff, the Cambridge Union Society, the Charles University at Prague, the Government of Colombia, the Committee for a Constructive Tomorrow, the Government of the Czech Republic, the Deutscher Bundestag, the Europäisches Institut für Klima und Energie, the European Parliament, Hancock Prospecting, the Heartland Institute, the Hong Kong and Shanghai Banking Corporation, the International Committee on Geoethics, the Moscow City Government, the Oxford Union Society, the St Andrews University Union, the Conference of the Parties to the United Nations Framework Convention on Climate Chance and the U.S. House of Representatives for facilitating discussion of these and related ideas at international conferences; and Professor Antonino Zichichi for having provided, at the Centre for Scientific Culture in Erice, Sicily, the high-level scientific forum from which these ideas sprang. Those acknowledged may or may not endorse the Argonauts' conclusions.

CLIMATE OF ERROR

The grave error of physics that created a climate 'emergency'

It was all a big mistake. Concern about dangerous global warming arose from a grave error of physics dating back to 1984. No one had noticed until now because **climate scientists had borrowed feedback mathematics** from control theory, another branch of physics, without quite understanding it. The control theorists whose science climatologists had borrowed had themselves not realized how it had been misused.

An international team of eminent climatologists and control theorists, gathered by Christopher Monckton of Brenchley, spent years hunting the error. Their 70-page scientific paper calculates that, after correcting the error, **manmade global warming will be only one-third of what climate scientists had predicted.**

There will be too little global warming to harm us. Small, slow warming will be a good thing overall. **There is no climate emergency. There never was.** The trillions wasted on destroying jobs and industries can now be spent on the world's many real environmental problems. Global warming is not among them.

SOME DEFINITIONS: **Emission temperature,** driven by the Sun's warmth, would obtain at the surface with no greenhouse gases in the air. **Feedback response** is extra warming, chiefly from more water vapour in warmer air, triggered by direct warming (e.g., by CO_2). **Solar feedback response** is triggered by emission temperature. **Noncondensing greenhouse gases** include CO_2, methane, ozone, nitrous oxide and CFCs but not water vapour. **The natural greenhouse effect** is the difference between emission temperature and temperature in 1850, when the industrial era began. **Equilibrium climate sensitivity (ECS)** is eventual, final warming by doubled CO_2.

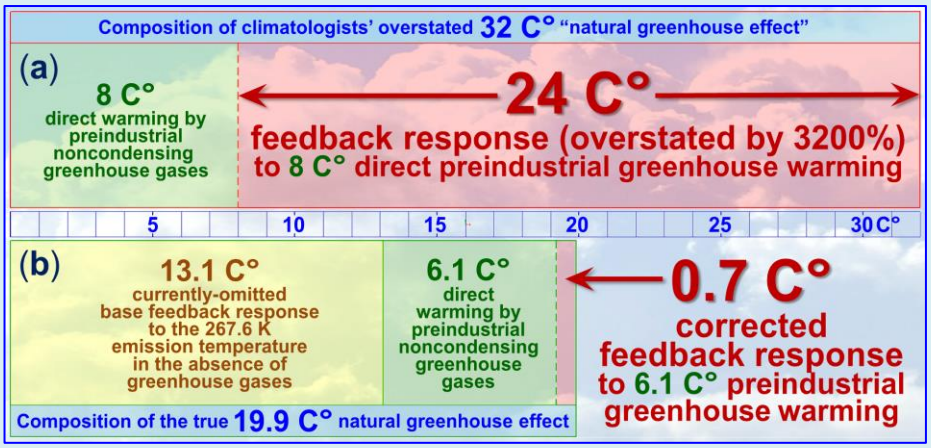

Fig. 1 (a) Erroneous and (b) corrected makeup of the natural greenhouse effect.

Climate scientists imagined the natural greenhouse effect was **32 C°**. Of this, they imagined **8 C°** was direct warming by preindustrial greenhouse gases, to which the remaining **24 C°** was feedback response (Fig. 1a).

That is why they imagined that feedback response would multiply every 1 C° of direct global warming by as much as 4 to give eventual, final global warming.

Direct warming by doubled CO_2 is only about **1 C°**, which climate scientists mistakenly imagine will trigger **3 C°** feedback response, so that 1 C° direct warming will become as much as **4 C°** final warming.

They had made two mistakes, one small, one very large. Their small mistake: **they had forgotten that without greenhouse gases in the air there would be no clouds** to reflect solar radiation harmlessly back to space, like a mirror. The true emission temperature would be about 12 C° larger than they had calculated. Thus, **the true natural greenhouse effect was not 32 C° but 12 C° smaller, at just 20 C°.**

Their very large mistake: they forgot the Sun was shining. For very nearly all of the preindustrial feedback response until 1850 – the extra warming all of which they thought had been triggered by greenhouse gases – was actually triggered by the Sun. **In effect, they added the solar feedback response to, and miscounted it as part of, the preindustrial feedback response to noncondensing greenhouse gases, thereby overstating that preindustrial feedback response by 3200%.**

The Argonauts calculate that, of the true 19.9 C° natural greenhouse effect (Fig. 1b), 13.1 C° was solar feedback response. Only **0.7 C°** was preindustrial feedback response to the 6.1 C° direct warming by greenhouse gases. **Climate scientists' 24 C° preindustrial feedback response was 33 times too large.** That was how they came to overstate the feedback responses both to direct preindustrial greenhouse warming and, in turn, to direct industrial-era warming from 1850-2020.

The effect of climate scientists' overstatement was severe. The Argonauts find that, due to the error, **currently-predicted manmade global warming is about 3 times too large.** Correction ends the crisis.

Climate scientists predicted far more global warming than has occurred

Since climate scientists' predictions have proven greatly overstated compared with real-world, measured medium-term warming, the Argonauts decided to find out **what climate scientists were getting wrong.**

In science, any theory – however beautiful or profitable – is false and must be amended or even replaced if real-world data contradict it. The large discrepancy between predicted and real-world warming in recent decades indeed showed **there must be something very wrong with the official theory.**

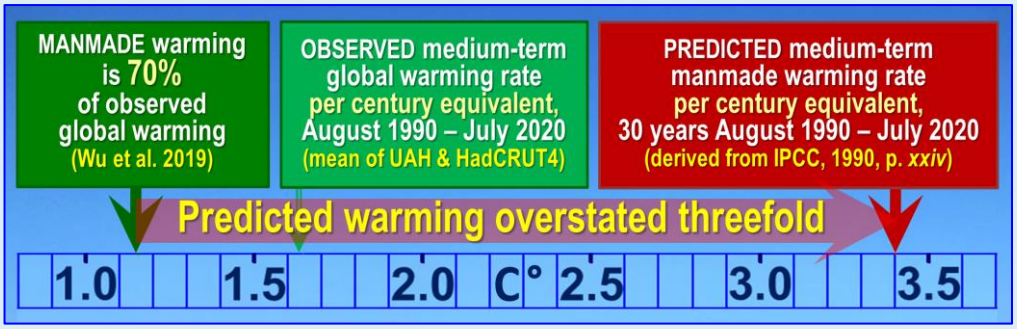

Fig. 2 Midrange projected vs. observed manmade warming rates, 1990-2020.

IPCC (1990, p. *xxiv*) had confidently predicted midrange medium-term manmade warming equivalent to **3.4 C°** per century. However, from 1990-2020, measured real-world manmade global warming was equivalent to just **1.15 C°** per century (Fig. 2).

IPCC's predicted medium-term manmade warming has turned out to be three times too large. That huge credibility gap between prediction and real-world change coheres with the Argonauts' calculations.

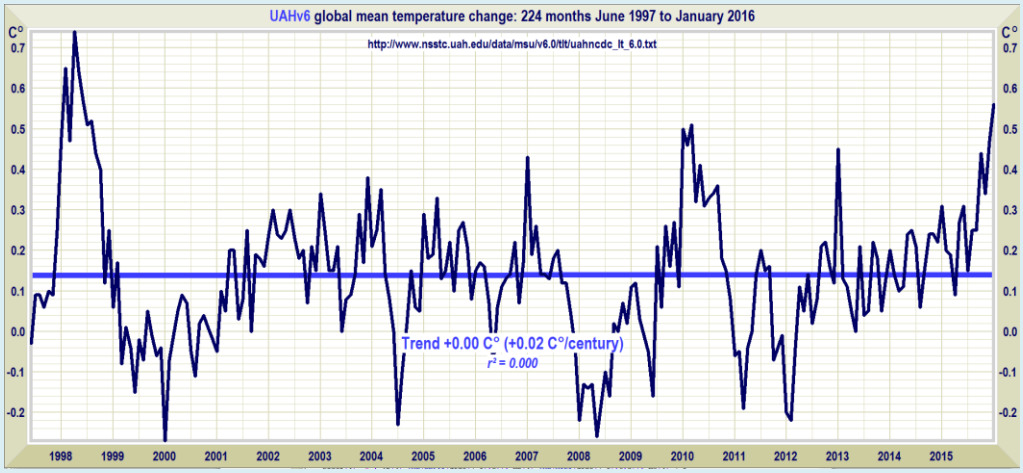

Fig. 3 **No warming for 18 years 8 months** from July 1997 to January 2016 (UAH).

Climate scientists had also not predicted **the near-19-year pause in warming from 1997-2015** (Fig. 3). Towards the end of that period, when one-third of our climate influence had arisen but had caused no warming, IPCC substituted its **"expert judgment"** for models' predictions and sharply reduced its medium-term predictions.

Inconsistently, IPCC did not also reduce its long-term headline global-warming prediction, which, despite billions spent on climate research, remains at 1.5-4.5 C° per CO_2 doubling. That prediction has remained unchanged since the Charney report (1979), more than 40 years ago. It was and is excessive.

As the Nobel-prizewinning physicist Richard Feynman used to say, "If it disagrees with experiment, it's wrong. In that simple statement is the key to science." **Predictions of global warming disagree with observed and measured real-world temperature change.** Correcting the error resolves that discrepancy.

How the error arose: climate scientists forgot the Sun was shining

The history of how the error arose is interesting. In the early 20th century, Arrhenius (1906) and Callendar (1938) had predicted that **final warming by doubled CO_2 in the air would be about 1.5 C°.** Even though feedback theory was then in its infancy, their estimates were more or less correct.

One of the earliest papers that laid **the mathematical foundation of feedback theory** was Black (1934). One morning in 1927, Harold S. Black was on the Lackawanna Ferry from Hoboken, New Jersey, on his way to work at Bell Labs in Manhattan, where he was developing methods to reduce noise on long-distance telephone lines. The equations for feedback in dynamical systems came to him, and he jotted them down on that day's *New York Times*, which is on display at the Bell Labs museum to this day.

Black's feedback amplifier circuit (Fig. 4) shows not only the μ amplifier (in climate, direct warming by greenhouse gases) and the β feedback block but also **the input signal *e*** (the emission temperature driven by the Sun's warmth in the absence of greenhouse gases). Black's paper calls ***e*** the **"signal input voltage"**.

Climate scientists had not realized one cannot have an amplifier without an input signal to amplify.

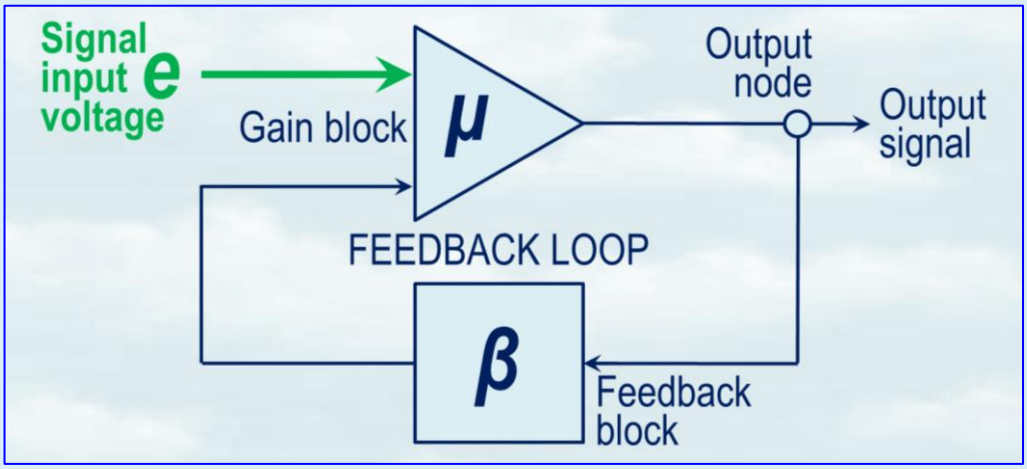

Fig. 4 Feedback-amplifier block diagram (Black 1934). The **input signal *e*** is the no-greenhouse-gas emission temperature climate scientists had overlooked.

The ***μ*** gain block in Black's block diagram (Fig. 4), amplifies the **input signal *e***, just as direct greenhouse-gas warming amplifies emission temperature. The ***β*** feedback block generates a feedback response not only to the ***μ*** gain block (direct greenhouse-gas warming) but also to the **input signal *e*** (emission temperature). Just follow the arrows.

Overlooking the large solar feedback response effectively adds it to, and miscounts it as though it formed part of, the actually minuscule preindustrial feedback response to direct warming by noncondensing greenhouse gases (such as CO_2, methane, nitrous oxide and ozone: changes in the concentration of the principal condensing greenhouse gas, water vapour, are treated as feedback). **That misallocation bloats the feedback response to greenhouse warming** and leads climate scientists to overstate global warming.

Climate scientists forgot that the Sun is shining and drives its own substantial feedback response.

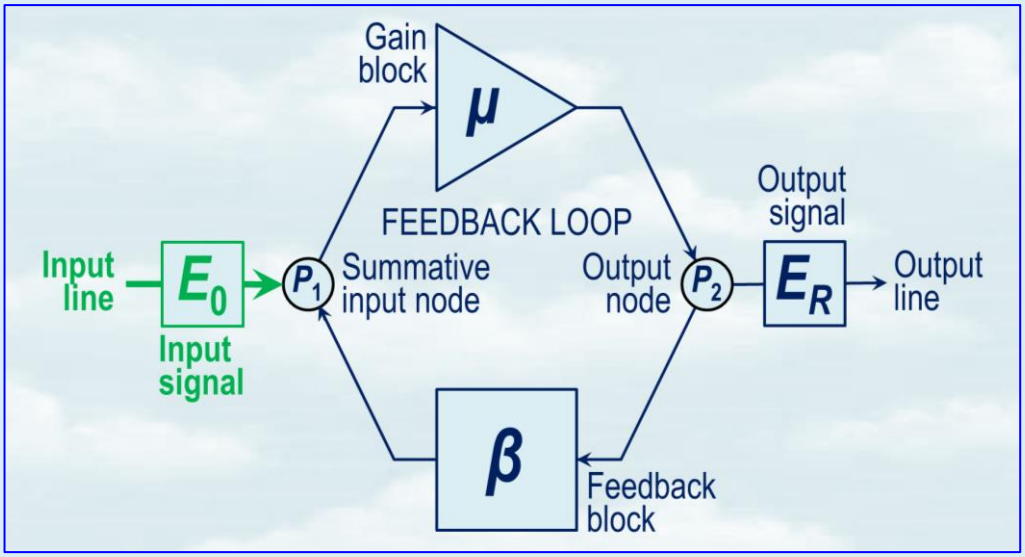

Fig. 5 Feedback amplifier block diagram (Bode 1945), showing **the input signal E_0** (in climate, emission temperature) that climate scientists had overlooked, thus effectively adding the substantial solar feedback response to the tiny feedback response to direct warming by preindustrial noncondensing greenhouse gases.

In 1945, Harold Black's colleague at Bell Labs, Hendrik Wade Bode, wrote the standard textbook on feedback amplifier design. It proved so popular that it was published almost annually for 30 years.

The feedback-amplifier block diagram (Fig. 5) is functionally identical to Black's. Here, **E_0 is the input signal**, whose large feedback response climate scientists had mistakenly added to the tiny feedback response to direct warming by greenhouse gases.

Unfortunately, it was at the very moment when digitization had diminished feedback theory's importance that climatologists cited Bode's book, but without understanding it. For instance, Hansen (1984) wrote:

> "We use procedures and terminology of feedback studies in electronics (Bode, 1945) to help analyse the contributions of different feedback processes. We define the system gain as the ratio of the net feedback portion of the temperature *change* to the total temperature *change*."

Here, Hansen erroneously describes the feedback fraction (the fraction of final or equilibrium temperature or warming represented by feedback response) as the "system gain". The system gain factor is actually the quantity by which the direct temperature or warming before feedback is multiplied to give the final or equilibrium temperature or warming after feedback has acted and the climate has resettled to equilibrium.

Hansen's more serious error, however, is not one of mere nomenclature. **He fails to mention, still less to account for, the solar feedback response.** Therefore, he imagines that the direct warming of little more than 1 C° from doubled CO_2 in the air will become an eventual or equilibrium warming of approximately **4 C°**, just as Lacis et al., Hansen's colleagues at the NASA Goddard Institute for Space Studies, would do in 2010 and 2013, and just as present-day models do (e.g., Zelinka et al., 2020, Sherwood et al., 2020).

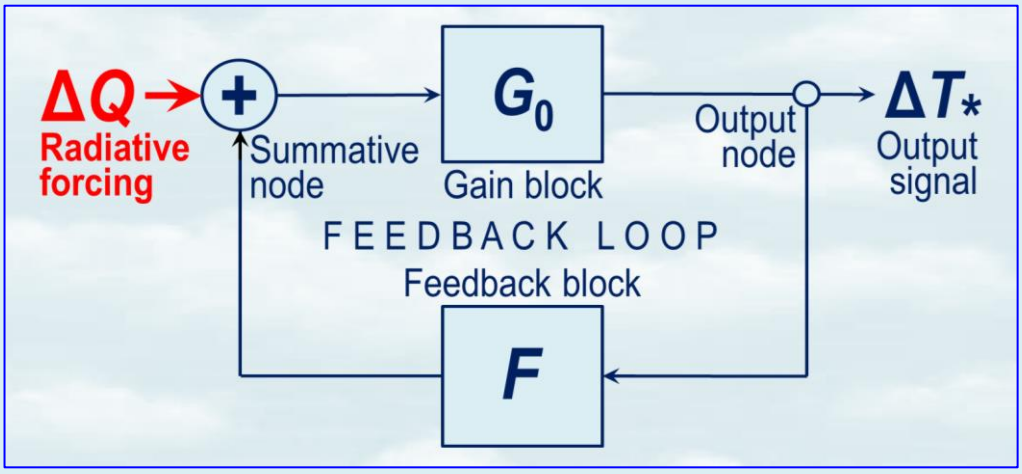

Fig. 6 Defective feedback block diagram (Schlesinger 1988). The input signal, emission temperature, is absent. Schlesinger thus implies that the large solar feedback response to it is part of the actually minuscule feedback response to preindustrial direct warming by noncondensing greenhouse gases.

Schlesinger (1988) compounded Hansen's error and cemented it in place. His feedback block diagram (Fig. 6) shows gain and feedback blocks, but, like Hansen, **he did not allow for emission temperature or its feedback response,** which he accordingly miscounted as part of the feedback response to direct warming by the preindustrial noncondensing greenhouse gases.

Thus, Schlesinger imagined that the feedback fraction – the fraction of final or equilibrium warming represented by feedback response – would be as much as **71%**, similar to the **75%** in Lacis et al. (2010).

In 1988, Hansen testified before the U.S. Senate and predicted very rapid global warming. However, **his predictions were rooted in his error**. That year the Intergovernmental Panel on Climate Change (IPCC) was brought into being. In 1990, again based on the error, its *First Assessment Report* predicted **three times as much medium-term global warming** as has really occurred in the 30 years since then (Fig. 2).

Its *Fifth* and most recent *Assessment Report* (IPCC 2013, p. 1450) defined climate feedback thus –

> **"Climate feedback:** An interaction in which a *perturbation* in one climate quantity causes a change in a second, and the change in the second quantity ultimately leads to an additional change in the first. A negative feedback is one in which the initial *perturbation* is weakened by the changes it causes; a positive feedback is one in which the initial *perturbation* is enhanced … the climate quantity that is *perturbed* is the global mean surface temperature, which in turn causes changes in the global radiation budget. … the initial *perturbation* can … be externally forced or arise as part of internal variability."

IPCC's definition does not reflect the fact, well established in control theory, that the input signal – in climate, the emission temperature driven by the Sun – itself engenders a large solar feedback response.

IPCC has an error-reporting protocol, which its member-states obliged it to adopt after it had published a series of **embarrassing errors**. Under that protocol, the present error was reported to IPCC. However, **IPCC refused even to acknowledge receipt of the error report,** though it was twice sent to several IPCC officials and to the secretariat. **Now that the error has come to light, IPCC is no longer needed.**

Consequences of the error

Fig. 7 Climate scientists imagine that the **8 C°** direct warming by preindustrial noncondensing greenhouse gases drove a **24 C°** feedback response. Their system-gain factor is thus **32** / 8, or **4**: in other words, they multiply any direct manmade warming by about 4 to get final warming. Since the direct warming in response to doubled CO_2 in the air is approximately **1 C°**, today's models predict about **4 C°** eventual warming after accounting for feedback response.

The most direct consequence of the error is that if emission temperature is omitted (Figs. 6-7), the large solar feedback response to it is wrongly added to, and accordingly miscounted as part of, the actually minuscule preindustrial feedback response to direct warming by greenhouse gases.

The team corrected this error and calculated that one should multiply the **6.1 C°** direct warming from the preindustrial noncondensing greenhouse gases not by a system-gain factor of **32** / **8**, or **4**, as climate scientists do. Instead, one should multiply it by a system gain factor of 6.8 / 6.1, or just **1.11**. Since warming accelerates a little as surface temperature increases, that **1.11** becomes about **1.19** today.

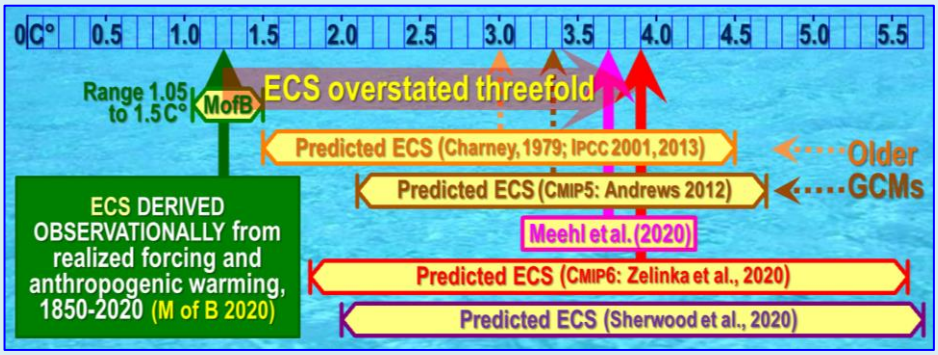

Fig. 8 Corrected final warming vs. climatologists' predictions.

Therefore, the 1.06 C° direct global warming in response to doubled CO_2 in the air becomes final warming of just **1.19** x 1.06, or **1.25 C°**.

Global warming will thus be less than a third of the 4 C° that climate scientists had imagined.

Fig. 8 compares corrected warming with predictions.

Figs. 1 and 8 can be combined to give Fig. 9, which shows the significant coherence between (a) climate scientists' **threefold overstatement** in 1990 of predicted medium-term manmade global warming to 2020, compared with real-world, measured warming from 1990-2020; and (b) climate scientists' **threefold overstatements** of final warming from doubled CO_2, compared with the corrected **1.25 C°**.

It will also be seen later that these **threefold overstatements** of predicted medium-term and long-term global warming at the surface cohere with the **threefold overstatement** of predicted medium-term warming several miles up in the tropical mid-troposphere over recent decades (Fig. 19).

Climate scientists' entire range of predictions of final warming is strikingly inconsistent with the rate of real-world warming to date. **However, the 1.25 C° final warming derived by the Argonauts after correcting climate scientists' error coheres with the rate of real-world, observed warming to date**.

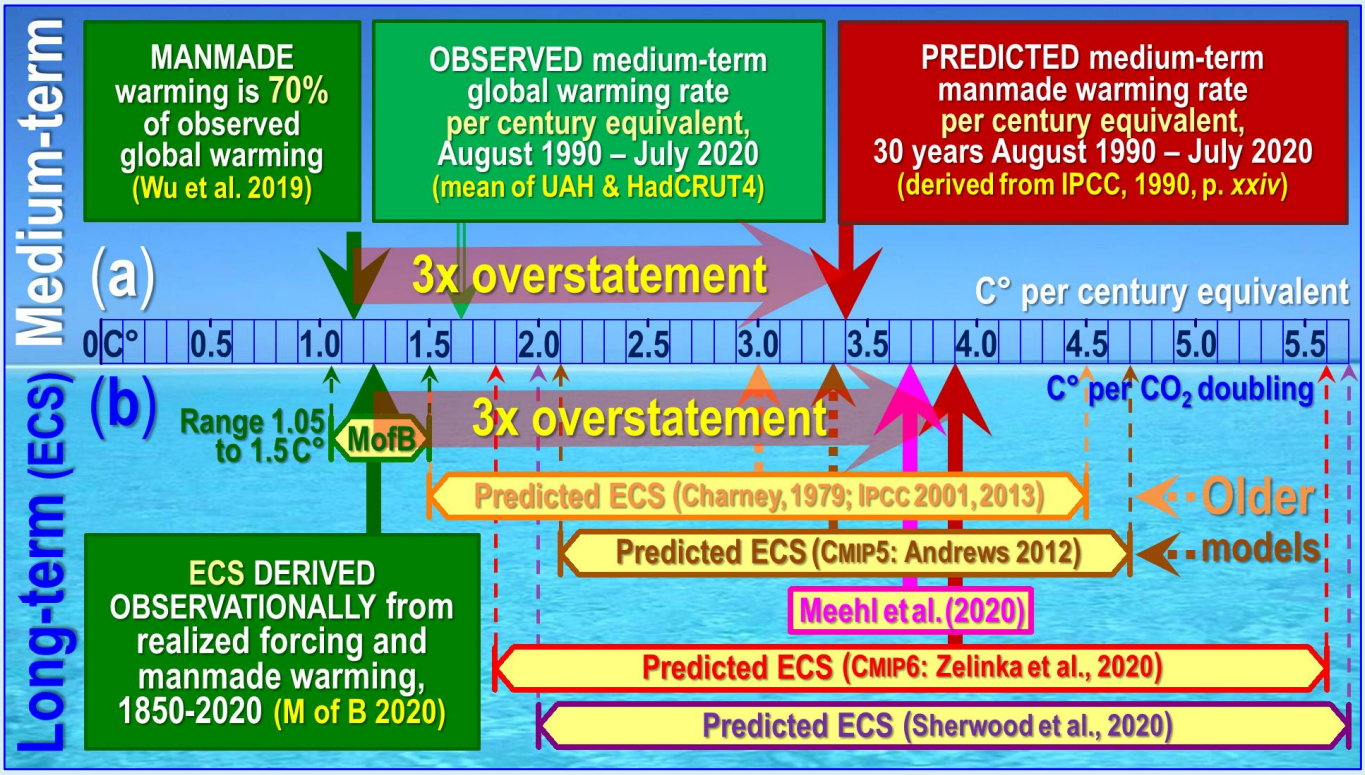

Fig. 9 Climatologists have over-predicted (a) medium-term global warming since 1990 and (b) long-term, final global warming (i.e., equilibrium climate sensitivity, or ECS), compared with observationally-based values. **Medium-term and long-term warming predictions both overstate the true warming threefold.**

Pages 8-9, which are a little technical, show how the Argonauts developed five tests to evaluate predictions of global warming. First, they used the tests to check their own calculation that after correcting climate scientists' error there would be **1.25 C°** final warming by doubled CO_2 (known as equilibrium climate sensitivity, or ECS), with a range of **1.05 to 1.50 C°**.

Next, they checked climate scientists' entire range of predicted ECS from **2.0 to 5.7 C°**, using values in this predicted range as inputs to an algorithm to discover whether and to what extent each prediction led to a contradiction.

The five tests that prove climate scientists' predictions are excessive

Lewis & Curry (2015) showed that without a giant climate model one could calculate final warming by doubled CO_2 from the observed global warming of the industrial era, from officially-estimated changes caused by our emissions of greenhouse gases and from Earth's measured radiative imbalance. They found that **final warming (ECS) would be about 1.5 C°**, in line with Arrhenius and Callendar a century ago.

Notwithstanding similarly small ECS calculated in many other learned papers (e.g., Lindzen & Choi 2011; Aldrin et al. 2012; Otto et al. 2013; Akasofu 2013; Spencer & Braswell 2014; Skeie et al. 2014; Monckton of Brenchley et al. 2015; Soon et al. 2015; Bates 2016), climate scientists did not reduce their predictions of **4 C° ECS or long-term warming** to cohere with the reduction that the slow real-world warming from 1850-2020 had forced them to make in their predictions of manmade global warming.

Therefore, the Argonauts developed **five mathematical tests** to establish whether any value of final warming by doubled CO_2 from climate scientists' range of predictions from **2 C° to 5.7 C°** was tenable.

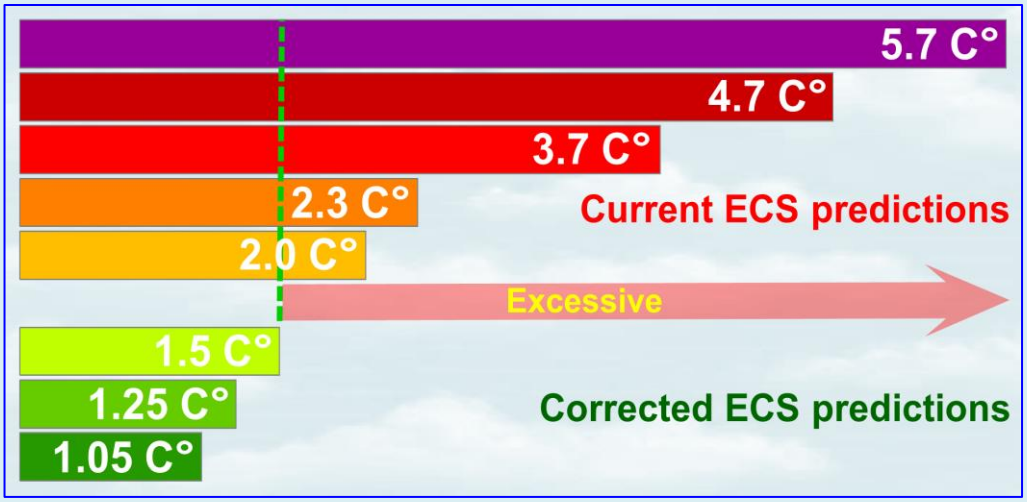

Fig. 10 The latest predictions of **final warming or ECS** (Sherwood et al. 2020), compared with **corrected ECS** derived by Monckton of Brenchley et al. 2020.

Test 1 was based on the team's calculations showing that after correction of climate scientists' error the true range of **ECS, or final warming by doubled CO_2, is 1.05 to 1.5 C°, with a midrange estimate of 1.25 C°**.

Even climate scientists' least prediction, **2 C°**, fail this test (Fig. 10).

All their greater predictions fail Test 1 still more severely.

Tests 2-5 are based on unit feedback responses (**UFR**), i.e., feedback responses per 1 C° of direct warming.

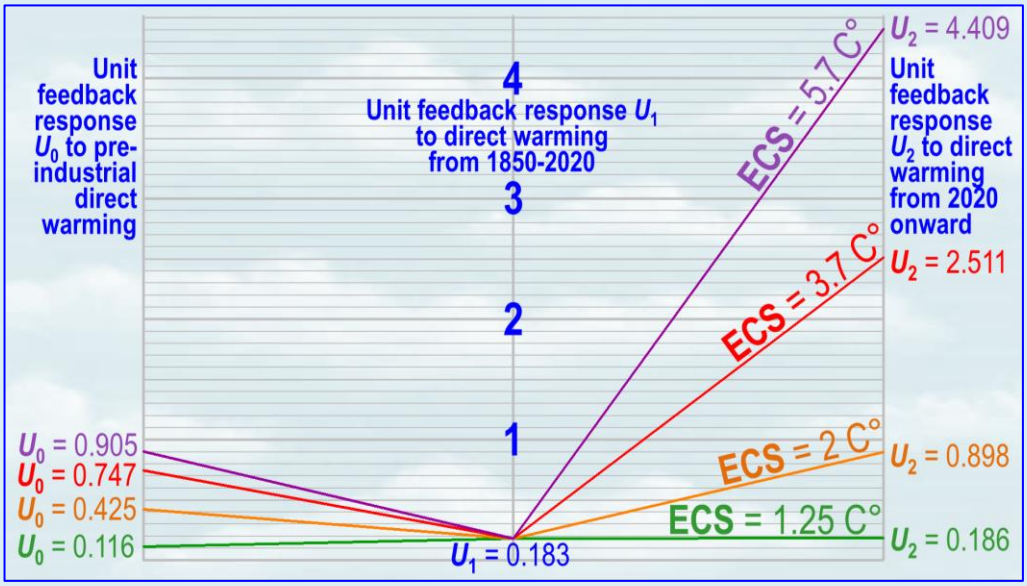

Fig. 11 Unit feedback responses $U_0 \le U_1 \le U_2$ (feedback responses per 1 C° of direct greenhouse warming) should increase with warming. They do just that assuming **1.25 C°** final warming by doubled CO_2 (equilibrium climate sensitivity, or ECS: the green line). However, based on predicted ECS ≥ **2 C°** in current climate models, the series impossibly goes down-up, instead of up-up.

Test 2 assumes the **UFRs** in response to direct greenhouse-gas warming will grow as the surface warms.

The **UFR** from 2020 onward should exceed the **UFR** from 1850-2020, which, in turn, should exceed the preindustrial **UFR**.

However, even **UFRs** based on climatologists' **2 C°** least prediction of final warming (ECS) by doubled CO_2 fail this test (see the dip in the orange line in Fig. 11).

All predictions above 2 C° fail Test 2 still more severely.

Test 3 works out how much global warming should have happened between 1850 and 2020, if a given prediction of final warming by doubled CO_2 (ECS) was true. From 1850-2020 there was **0.9 C°** measured global warming, However, even the predicted **2 C°** low-end final warming by doubled CO_2 (ECS) implies **1.4 C°** warming from 1850-2020, more than half as much again as the **0.9 C°** warming over the period.

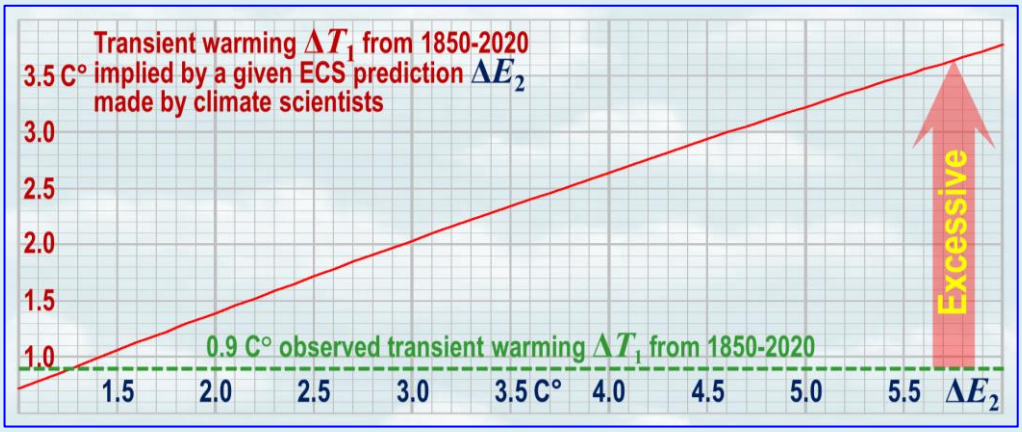

Fig. 12 All current predictions of final warming (ECS) of **2 C°** or more by doubled CO_2 imply warming from 1850-2020 far above the observed **0.9 C°**.

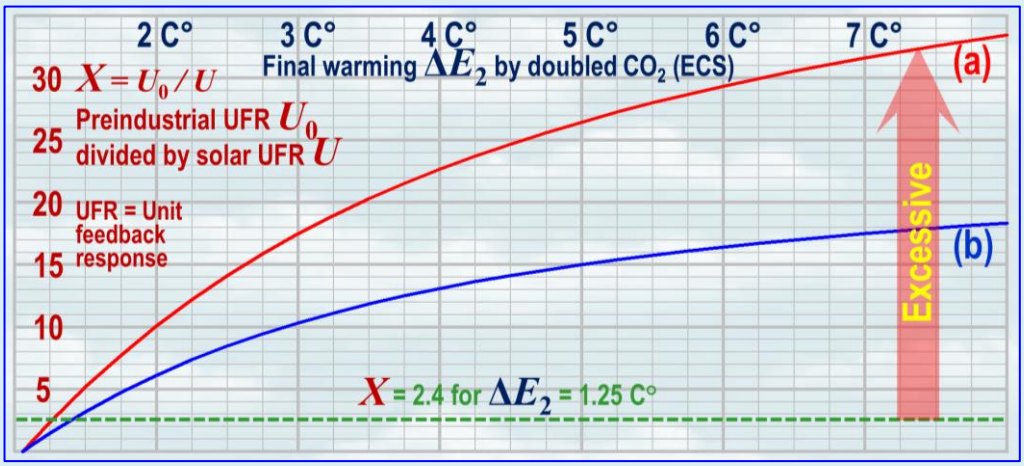

Fig. 13 The increase in the **base UFR ratio** X (the preindustrial **UFR** divided by the emission-temperature **UFR**) implied by predicted final warming ΔE_2 by doubled CO_2, where emission temperature is **(a) 267.6 K** and **(b) 255.3 K**.

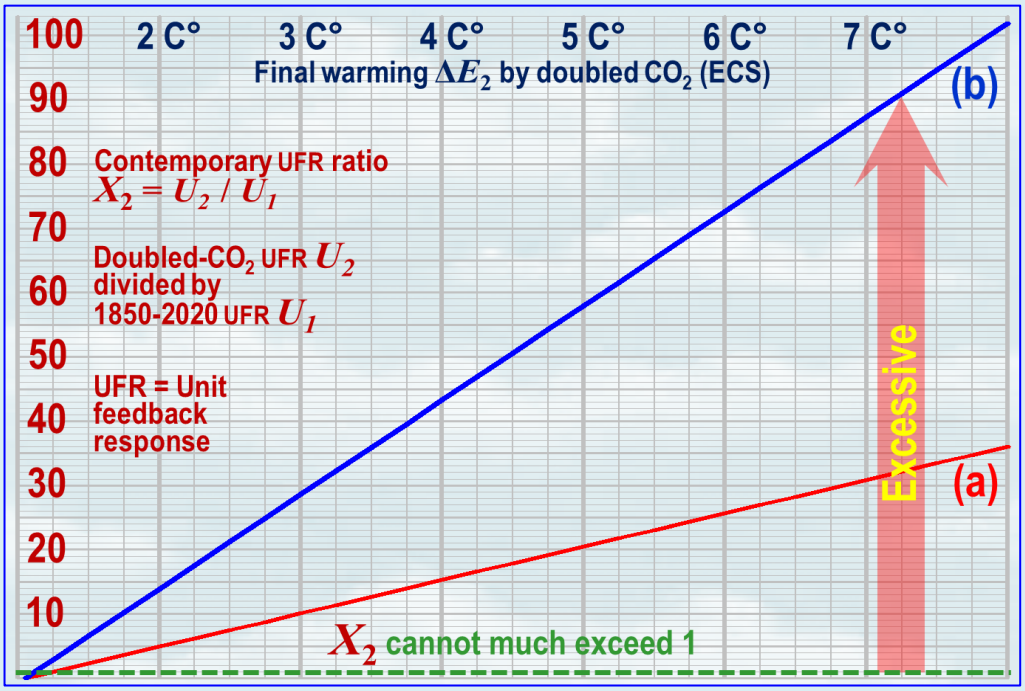

Fig. 14 The increase in the **contemporary UFR ratio** X_2 (the doubled-CO_2 **UFR** divided by the 1850-2020 **UFR**) derived from predicted final warming ΔE_2 by doubled CO_2 (ECS), for emission temperature **(a) 267.6 K** and **(b) 255.3 K**.

Test 3: At the **3.7 C°** midrange ECS, from 1850-2020 there should have been not **0.9 C°** but **2.5 C°** warming.

The high-end **5.7 C°** final warming would imply **3.6 C°** warming from 1850-2020: **four times** the real-world **0.9 C°** (Fig. 12).

Thus, all of climate scientists' predictions fail Test 3.

Test 4 derives the preindustrial **UFR** and the **UFR** triggered by emission temperature, from an ECS prediction and takes their ratio X.

Even climate scientists' **2 C°** least prediction implies a preindustrial **UFR** ten times the emission-temperature **UFR**. At **1.25 C°** ECS, it is just **2.4 times.**

The excess grows rapidly with greater predictions (Fig. 13).

Test 5 derives the doubled-CO_2 and 1850-2020 **UFRs** from a given ECS prediction and takes their ratio X_2.

Here, too, even at **2 C°** predicted ECS, doubled-CO_2 **UFR** is **5 times** the 1850-2020 **UFR**.

At **3.7 C°** predicted midrange ECS, doubled-CO_2 **UFR** is **14 times** the 1850-2020 **UFR**.

At **5.7 C°** predicted top-end ECS, doubled-CO_2 **UFR** is **24 times** the 1850-2020 **UFR**.

Values of X_2 much above **1** are impossible.

Climate scientists' entire range of ECS predictions fails Test 5.

Accordingly, **the entire range of current global-warming predictions fails all five tests;** and, as Figs. 10-14 show, the larger the prediction the greater the failure. By contrast, the **1.25 C°** final warming by doubled CO_2 that the team calculated, and which serves as the basis for test 1, complies with tests 2-5.

How the climate models overstated growth in upper-atmosphere water vapour

Once the Argonauts had corrected climate scientists' error of physics and had established by theoretical means, using the five tests, that **climate models are predicting three times too much global warming,** they looked for a physical discrepancy between how models predict that a relevant aspect of the climate will behave and its measured, real-world behaviour.

Since **climate models overstate preindustrial feedback response by 3200%,** the Argonauts began to study how models represent water vapour feedback, which climate scientists regard as far and away the most important feedback process in the climate, triggering all or nearly all net feedback response.

Sure enough, **a notable discrepancy between models' predictions and observed reality was found.** Climate models predict that the tropical mid-troposphere, six miles up, should be warming at more than twice the surface rate. However, **in reality there is no hot spot**. The tropical upper air is warming only a little faster than the surface. All the models were wrong. **Wherever the real-world data show the models are wrong, the data are to be preferred.** There was a large error lurking somewhere.

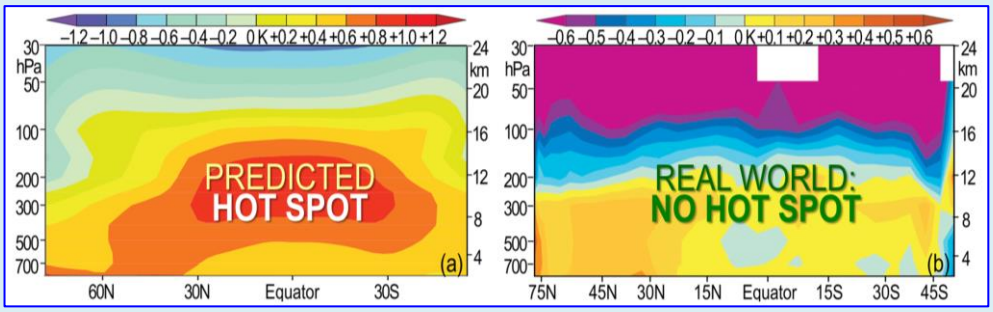

Fig. 15 (a) Predicted vs. (b) real-world temperature profile of the atmosphere

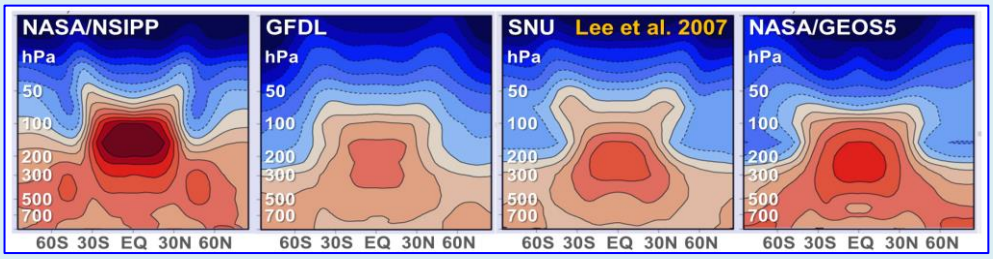

Fig. 16 The hot spot in four models (Lee et al., 2007: each colour band is 1 C°)

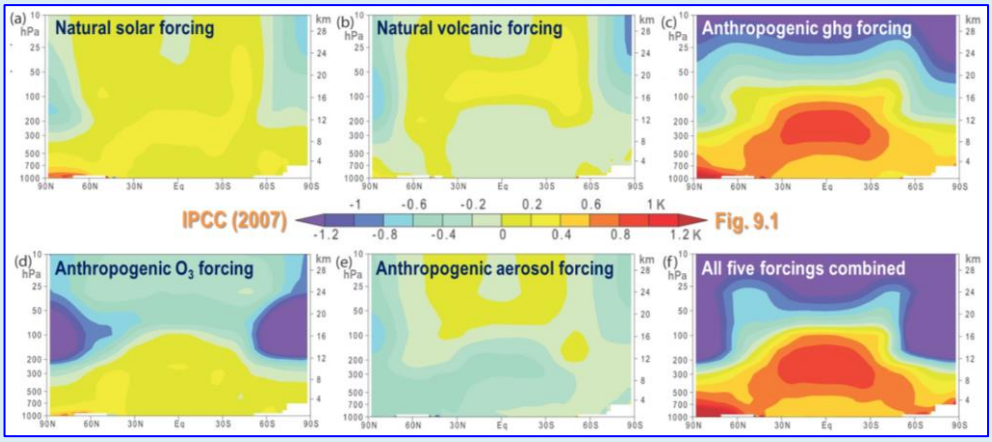

Fig. 17 The hot spot as the imagined fingerprint of manmade global warming

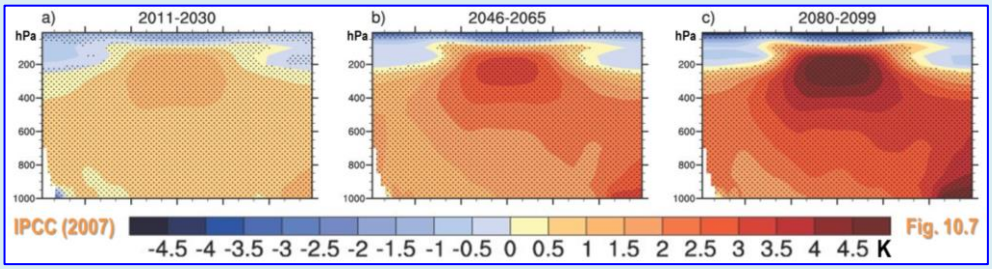

Fig. 18 IPCC (2007, Fig. 10.7) predicts **the hot spot** will grow with warming.

Fig. 15a (IPCC (2007, fig. 9.1c) predicts this tropical mid-troposphere **hot spot**, but there is **no hot spot** in, the real-world vertical profile of temperature up to 15 miles high, measured by millions of balloon sensors (Fig. 15b: Lanzante et al. 2006)

The hot spot is predicted in many major climate models (Fig. 16). Without it, the water vapour feedback cannot be as substantial as the models predict. Why, then is the predicted **hot spot** absent?

IPCC (2007, fig. 9.1: here Fig. 17) assumed **the hot spot** was the fingerprint of manmade warming.

Natural influences from the Sun, volcanoes and manmade ozone (O_3) and aerosols appeared not to cause **the hot spot**, but manmade greenhouse-gas warming did.

But **IPCC had erred**. Climate scientists now say **the hot spot** would be a sign of global warming however caused.

Yet the hot spot remains absent. IPCC (2007, fig 10.7: here Fig. 18) predicted **the hot spot** would emerge over time with global warming. **But IPCC had erred again**.

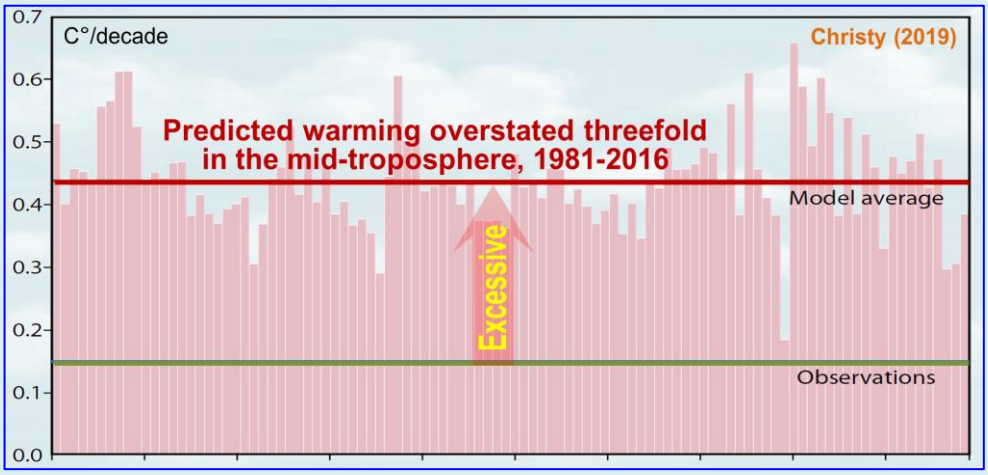

Fig. 19 Models overstate tropical mid-troposphere warming **threefold**.

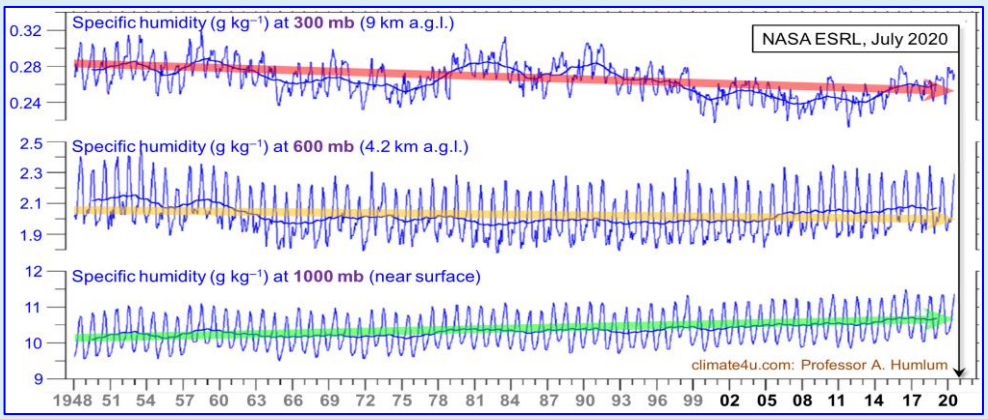

Fig. 20 Specific humidity is declining in the mid-troposphere (Kalnay et al. 1996)

Though IPCC predicted rapid warming in the tropical upper air, from 1981-2016 **models overstated it threefold** against **real-world data** (Christy 2019: here Fig. 19).

Models have been programmed to assume water vapour, like CO_2, methane, nitrous oxide and ozone, would be well mixed throughout the atmosphere. **They err**.

The models predict water vapour will increase at all altitudes. **They err**. In the mid-troposphere, specific humidity has been falling for 70 years (NASA ESRL 1948-2020: here Fig. 20).

No hot spot means small water vapour feedback and very little warming, confirming the team's analysis and showing that it is coherent with real-world observation.

Conclusion: The moral imperative is access to affordable electricity for all

After correcting **climate scientists' grave error of physics**, global warming will be **a third** of what they predict, coherent with real-world warming **a third** of what they had predicted, and coherent with the **decline in water vapor** in the tropical mid-troposphere and with **the absence of the predicted hot spot**.

Due to the error, **many banks no longer lend to developing countries** for coal-fired power: **from 2010** the World Bank; **from 2015** Credit Agricole, Citibank, ANZ and Goldman Sachs; **from 2016** JP Morgan, Deutsche Bank, PNC, Credit Suisse, ABN Amro, Standard Chartered, US Bancorp, Commerzbank and Barclays; **from 2017** DZ Bank and NAB; **from 2018** DBS; **from 2019** even the African Development Bank.

Yet the World Health Organization says **unpowered homes kill 4 million a year** from inhaling cooking-fire smoke and 500,000 women a year in childbirth – just two of the numerous causes of premature death from lack of access to electricity. The International Energy Agency defines "access" as no more than the capacity to use **one 60-Watt light-bulb for 4 hours daily**. **One billion people lack access to electrical power – a development priority that can now be safely and affordably met by coal-fired generation**.

Unjustifiable fear of large, rapid, dangerous global warming has gobbled up environmental-improvement funding that should have been spent on affordable and practicable solutions to the many real environmental problems arising from poverty and squalor in developing countries – solutions such as **universal, affordable, continuous, reliable coal-fired and gas-fired electrification** that is now possible once more.

Following correction of the **error**, indoctrination of children about global warming can now cease. **Many have had their childhoods ruined by baseless fear.** Some have even **killed themselves** in despair.

There are many real environmental problems, but **the slow, gentle, net-beneficial warming** to be expected after correcting climate scientists' long-standing and costly error is not among them. The panoply of climate rules, restrictions, taxes, imposts, conferences, speeches and treaties is unnecessary. **Manmade global warming did not, does not and will not cause a "climate emergency". It's all over.**

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